

**SUPPLEMENTAL DRAFT
GENERIC ENVIRONMENTAL IMPACT STATEMENT**

**THE UNIVERSITY OF ROCHESTER
INSTITUTIONAL PLANNED DEVELOPMENT
REZONING SOUTH CAMPUS**

**Town of Brighton
Monroe County, New York**

January 2014

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University of Rochester – IPD Rezoning
Town of Brighton
Monroe County, New York
Supplemental - Draft Generic Environmental Impact Statement

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I. Introduction

A. Description of Proposed Project

This Supplemental Draft Generic Environmental Impact Statement (S-DGEIS) is prepared pursuant to the New York State Environmental Quality Review Act (SEQRA), Article 8 of the NYS Environmental Conservation Law, and its implementing regulations – 6NYCRR Part 617.

B. Synopsis of the S-DGEIS

This S-DGEIS contains written narratives and supporting documents to outline changes to the DGEIS since the completion of the DGEIS review and public comment period were completed.

A Draft Generic Environmental Impact Statement (DGEIS) was prepared for this project by T. Y. Lin International (formerly FRA Engineering and Architecture, P.C.) on behalf of the University of Rochester, the Applicant. The DGEIS was based upon the scope adopted by the Town of Brighton Town Board on April 13, 2005. The DGEIS for the Rezone Property was deemed complete by the Town Board at its December 2, 2005 meeting, and is hereby incorporated into the S-DGEIS by reference.

Copies of the accepted DGEIS were provided to the Town for public review and comment. Copies of the DGEIS were provided to the Town representatives, Town consultants, and State reviewing agencies. A copy of the DGEIS was made available to the public at the Town Hall, the library and on the Town's website. A public hearing was held on January 11, 2006, which was continued and closed on March 8, 2006.

Changes and Additions to the DGEIS

It has been determined that changes have taken place warranting the preparation of an S-DGEIS and completion of the attendant process.

A summary of the changes includes:

- Removal of approximately 8 acres U of R lands from the proposed IPD District developable land because of acquisition of some acreage by the NYS DOT to make way for I-390 corridor improvements and the use of an approximately 3.14 acre parcel for an RG&E Substation that will serve the electrical capacity needs of the Town as well as the University. Refer to the figure on page 5.
- Commencement of construction of new I-390 on-ramps by NYS DOT.

- Preparation of a revised concept Master Plan for the South Campus site which reduces the overall square footage of future development (with an increase in residential, and a decrease in non-residential square footage); shifting all (but especially non-residential uses) away from neighboring residential properties, as described herein.
- A revised Drainage Study to address updated stormwater regulations (NYS Department of Environmental Conservation Phase II, General Permit 2010).
- An analysis of downstream watershed, including a hydrological analysis of Furlong Creek.
- A delineation of the old growth habitat found within the woodlot EPOD on-site.
- An update to the tree survey (conducted in the same manner as the original survey) and an analysis of significant trees located on-site.
- An update to traffic analysis, including obtaining new traffic data for three intersections located within the Town.
- An updated wetland boundary delineation and mapping.
- A proposal for the construction of a clinical imaging building located on the South Campus site to be built as soon as possible. (This would be the first project for the South Campus site comprising this IPD District)

If there are no changes from the original DGEIS document, the original document will be incorporated by reference to that particular section.

C. DGEIS and University Master Plan – Summary Comparison

Since completion of the DGEIS, the U of R has completed work on two major initiatives: development on a new strategic plan, and a comprehensive master plan. The two plans have been developed in concert, resulting in a Master Plan that is complementary with the objectives of the strategic plan addressing the quality and growth of the University. The Campus Master Plan was formally adopted by the University in 2009.

The full build-out of the University of Rochester has been envisioned in the University of Rochester Campus Master Plan. It considers the development of approximately 5 million square feet of new research, clinical, academic and residential growth over the next 20 years, primarily focusing on the Mid-Campus/Medical Center area (in the City of Rochester). It also addresses potential build out of the South Campus (in the Town of Brighton). In addition to the future expansion to the existing Laser Lab located on the South Campus site,

near term plans include the construction of an up to four story, 122,000 square foot building on East River Road for outpatient clinical use (the proposed imaging building referenced above).

When the DGEIS was prepared, the U of R had not yet undertaken its Campus Master Plan work, and therefore, a series of development and build-out assumptions were made about future uses, densities, locations of potential buildings and the timing of expansion. Since the completion of the DGEIS, the Master Plan has been completed, and therefore, more detailed information about University expansion within the Town of Brighton is now available. Where applicable, this information has been provided in this S-DGEIS in response to questions about the future build-out and associated impacts to the community and environment. Figures from the University of Rochester’s Campus Master Plan are included with this document (Figures 1 through 4). In summary, the University of Rochester Campus Master Plan indicates the following for the South Campus which represents several changes from the original IPD application:

Comparison of South Campus Plans



IPD Application Materials - DGEIS

Existing Residential:	338,600 GSF
Existing Office/Research:	332,671 GSF
Proposed Office/Research/Clinical:	1,972,207 GSF
Overall Total At Full Build:	2,643,478 GSF



Current Master Plan for South Campus

Existing Residential:	338,600 GSF
Existing Office/Research:	430,762 GSF
Proposed Residential:	476,400 GSF
Proposed Office/Research/Clinical:	1,290,050 GSF
Total New Proposed:	1,766,450 GSF
Overall Total At Full Build:	2,535,812 GSF

- **Residential:** The addition of approximately 476,400 square feet of residential buildings, which will increase the housing area from 338,600 to 815,000 square feet. The new graduate apartment units will be energy efficient, in compliance with the most

current building codes and will employ green building measures. Building heights are expected to be four floors.

- **Office/Research/Clinical:** Approximately 1.29 million square feet of office/research/clinical space, which includes an addition to the existing Laser Lab of approximately 100,000 GSF. **This represents a reduction in the planned build out of these types of uses by approximately 682,000 square feet.** These building locations are proposed in the northern portion of the South Campus site along the Route 390/ East River Road corridors, away from residential streets. Anticipated building heights are expected to range from one to five floors maximum.
- **Buffers:** An expanded buffer surrounding all uses from existing residences. The non-residential buildings are concentrated along the highway and East River Road, much further away from the adjacent residential neighborhoods, as compared to the concept plan included in the DGEIS as part of the original application.

Therefore, the IPD rezoning permits development that falls within the following thresholds:

- 1.29 million square feet of office, research and clinical care, orientated to be north of existing housing with no buildings taller than five stories.
- 476,400 square feet of residential buildings all located west and southwest of the adjacent residential neighborhood. The proposed residential buildings will be four stories.

	Building Square Footage, South Campus		
	Existing, GSF	DGEIS	Master Plan, GSF
Existing Housing (Whipple Park)	338,600	338,600	338,600
Existing Institutional (University Facilities & Services Building)	43,888	0	0
Existing Institutional (Advancement & Alumni Center)	133,191	133,191	133,191
Existing Institutional (Laser Lab)	297,571	199,480	297,571
New Housing	-	-	476,400
New Institutional	-	1,972,207	1,290,050
Total	813,250*	2,643,478	2,535,812

*DGEIS stated 689,900. The total above includes the Laser Lab expansion, which was completed after the completion of the DGEIS

II. Description of the Action – Changes from DGEIS

A. Overview of Action

As outlined in the original November 2005 DGEIS, the proposed action by the University for rezoning to an IPD District for its South Campus through Incentive Zoning remains unchanged. Please refer to the November 2005 DGEIS Section II. A. Page 3.

The Proposed Amenities outlined in the original DGEIS that remain are as follows:

1. Donation of the parcel south of Crittenden Road (42.55+/- acres).
Dollar value: \$265,000 (based on a 2004 value)
2. Planting enhancements within the 100 foot buffer zone adjacent to residential areas.
Dollar value: \$100,000
3. Elimination of any future access to Crittenden Road.
Dollar value: \$1,000

Additional amenities outlined in this document are proposed to alleviate existing flooding conditions along the Crittenden Road properties in the Furlong Creek area, as follows:

4. Revise storm sewer connections on the developed portion of the South Campus (in Whipple Park) to redirect drainage away from flooding area.
Dollar value: \$7,500
5. Close an existing swale that connects the south wetland area to the Furlong Creek watershed by creating a berm.
Dollar value: \$5,000
6. Construct an outlet to control ponding elevation from the south wetland area on the South Campus through the railroad embank to discharge to Furlong Creek on the west side of the embankment (thus reducing the potential to overtop the berm and cause flooding).
Dollar value: \$35,000

The proposed IPD District includes a mix of uses including office, research, clinical care, and housing. The original DGEIS identified the proposed district as a mix of research, office, housing, storage and university-related supporting uses.

The building concept plan included in this document has been updated to reflect the University Master Plan, as described above (see Figure 4).

B. Requested Incentives

The requested incentives originally outlined in the DGEIS have been updated and are as follows:

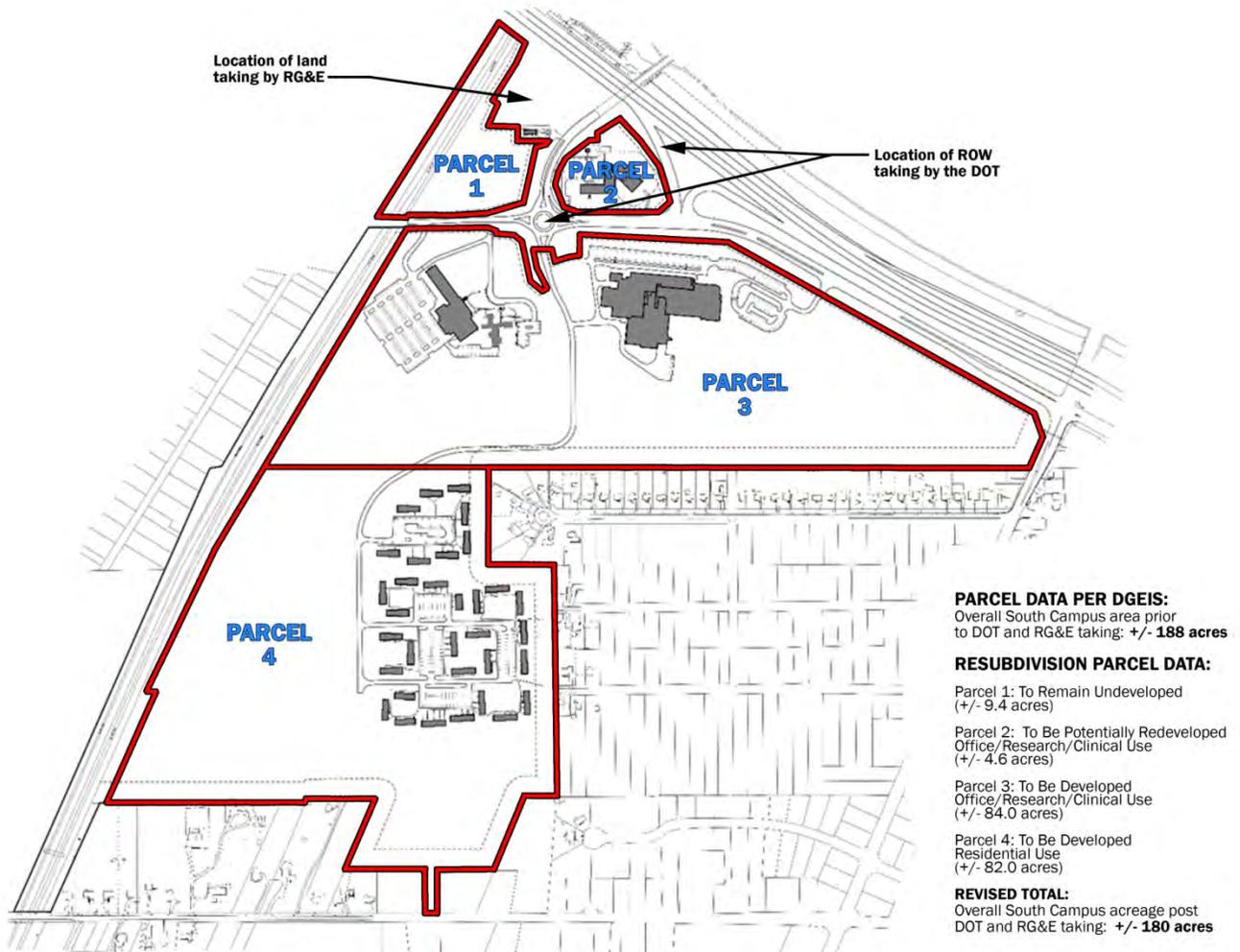
1. The rezoning itself, though the University fully believes that its request for rezoning to an IPD district could stand on its own merits under conventional zoning practices.
2. In the site area north of East River Road, a maximum building height of 90 feet.
3. In the site area south of East River Road and 250 feet north of the property boundary parallel to Southland Drive from W. Henrietta Rd to the western corner and 250 feet west of the Southland Drive property boundary west corner along the line of the Southland Drive property boundary to Lehigh Valley Trail property boundary, a maximum building height of 75 feet.
4. In the zone 250 feet north and 250 feet west of the property boundary parallel to Southland Drive, a maximum building height of 60 feet.
5. In the site area south of the property boundary parallel with Southland Drive, which is proposed to be developed for residential use, a maximum building height of 50 feet to the eaves with a total maximum height of 60 feet.
6. A maximum development density of 15,850 gross square feet per acre (per town code: 180 acres – 20 acres wetland/buffer = 160 acres. 2,535,812 GSF/160 acres = 15,850 GSF/acre).

Please refer to Appendix H for a full description of the Draft Rezoning Ordinance and supporting graphics.

C. Location and Surrounding areas

The Location and Surrounding areas are unchanged from the DGEIS; therefore, that section of the DGEIS is incorporated by reference. Please refer to the November 2005 DGEIS Section II. B. Page 7.

The total land area of the proposed IPD has been reduced by 8 acres as described above in section I. B. above, and is illustrated in the following figure.



D. Overview of purpose, need and benefit

With the minor decrease in proposed IPD land area (8 acres less), this section remains unchanged from the DGEIS. The remaining portion of the DGEIS is incorporated by reference. Please refer to the November 2005 DGEIS Section II. B. Page 7.

E. Overview of impacts

This section of the DGEIS remains unchanged, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section II. B. Page 8.

III. Required Permits/Approvals Subject to SEQR**A. Approvals Needed, Permits and Issuing Agencies**

This section of the DGEIS remains unchanged, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section III. A. Page 8.

IV. Project Purpose, Need and Benefit**A. Action Purpose**

This section of the DGEIS remains unchanged, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section IV. A. Page 9.

B. Need the Action is Responding to

This section of the DGEIS remains unchanged, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section IV. B. Page 9.

C. Social Benefits

This section of the DGEIS remains unchanged, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section IV. C. Page 9.

D. Economic Benefits

This section of the DGEIS remains unchanged, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section IV. D. Page 9.

E. Other Benefits

This section of the DGEIS remains unchanged, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section IV. E. Page 10.

V. Environmental Setting

A. Topography, Geology & Soils

This section of the DGEIS remains unchanged, except as described below, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section V. A. Page 10.

As part of an extensive drainage analysis which was conducted for the South Campus site, conceptual grading plans have been developed utilizing the current Master Plan. These conceptual grading plans were done at a one foot contour interval, and include all areas of proposed disturbance on the South Campus property. Conceptual grading around buildings, across parking areas, and along roadways is depicted, in addition to proposed locations of storm water management facilities and bio-retention areas. Earthwork will be performed in phases, with each proposed building or phase of development, as necessary. Illustrated over a set of five sheets, the conceptual grading can be found in Appendix G.

B. Water Resources, Stormwater Runoff

As described above in Section I. B, the proposed IPD rezone area was reduced in size by 8 acres. Some minor drainage modifications and a small detention area were installed recently as part of the NYS DOT's I-390/ Kendrick Road / East River Road improvement project, which introduced slight modifications to the exiting drainage areas in that area of the IPD as compared to the descriptions in the DGEIS.

This S-DGEIS includes a completely new drainage analysis, which includes re-definition of the drainage patterns and sub-drainage areas. The Drainage Report is included as Appendix A.

The Rezone Property study area was divided into 5 separate drainage areas (subareas), as shown on Figure B in the Drainage Report, that define the existing drainage patterns. Subarea 1 consists of 45-acres located in the northwest portion of the Rezone Property; Subarea 2 consists of 66 acres located in the northeast portion of the Rezone Property; Subarea 3 consists of 39-acres located in the middle portion of the Rezone Property including the Whipple Park Apartments; Subarea 4 consists of 31-acres located in the southern portion of the Rezone Property, north of Crittenden Road; and Subarea 5 consists of 41.5-acres located south of Crittenden Road (Lilac Park Subdivision). Within the boundaries of the Rezone Property there are five primary watercourses / drainage ways. The watercourses serve as receiving locations for storm water runoff from the adjacent topography and direct the discharge to the Erie Canal or to Red Creek.

The total acreage of the drainage subareas is greater than that of the Rezone Property as the topography of the area is such that off-site areas drain toward the Rezone Property, directing surface and sub-surface flows in the general direction of the Rezone Property.

The drainage from Subarea #2 discharges to the Erie Canal (which is not considered a natural watercourse). Subarea #2 has been divided into four sub-subareas to account for the four separate systems this drainage area uses to reach the Canal. The first Subarea #2A consists of the western portion of Murlin Drive and some of the existing buildings and parking areas on the east side of Murlin Drive. This area sheet drains or is directly discharged to the existing detention pond located in the south-east quadrant of the East River Road and Murlin Drive intersection. This detention pond was recently constructed as part of the NYSDOT I-390 and E River Road improvements. The pond outlets via an outlet structure directly to the Erie Canal. The second subarea #2B primarily consists of the eastern portion of Subarea #2 from Murlin Drive. This area sheet drains or is directly discharged to an existing detention pond located east of the Laser Lab. The detention pond discharges via a large outlet structure and storm sewer to the Erie Canal. There is an off-site area that drains through this subarea. It consists of approximately 44-acres and includes the residential area to the east of the Whipple Park Apartments and south of the Laser Lab/COI, containing the residences located along Southland Drive, Sylvia Road, and Doncaster Road. The storm water runoff is collected in a closed conduit drainage system that conveys the storm water to the existing detention pond. Subarea #2C receives sheet drainage from eastern portions of Subarea #2 that do not discharge to the existing detention pond. This consists mainly of lawn areas south of East River Road. The fourth sub-area is Subarea #2D which consists of the parcel north of East River Road. This area is collected in a closed conduit storm sewer system and discharged into a storm sewer system in Murlin Drive. This system outlets directly into the Erie Canal. Refer to Figure B-2 in the Drainage Report.

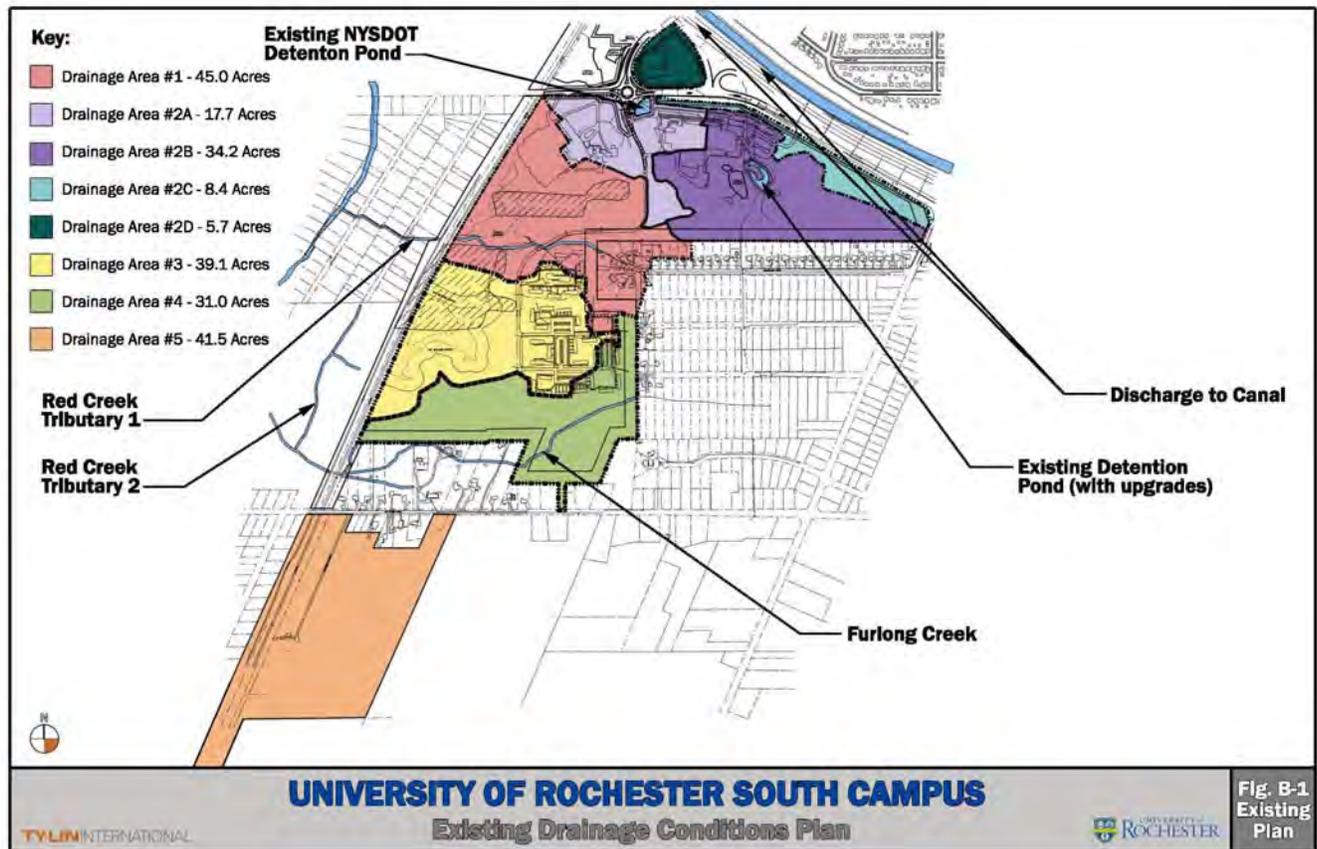
The first natural watercourse collects drainage from Subarea 1. The upstream end of the watercourse is located immediately north of the Whipple Park apartments and flows from east to west. The discharge from this watercourse is directed to Red Creek, located primarily within a forested wetland area. Stormwater runoff is received predominantly from regions to the north and east of the watercourse. The topography to the north slopes in the southwest direction. The slope on the east side directs runoff approximately due west into the watercourse. A second, minor drainageway, which flows southwardly with stormwater runoff collected from the immediate surrounding topography, joins into the main watercourse from wooded wetlands to the north. The watercourse directs the storm water west to the western boundary of the Rezone Property to an existing 24-in x 24-in stone culvert. The culvert was built for the construction of the Lehigh Valley Railroad and is in good condition. The areas upstream and downstream of the culvert are lined with dense, natural vegetation. Beyond the

culvert and western boundary of the Rezone Property, the watercourse continues to direct stormwater westerly through a small section of residential subdivision, and discharges to Red Creek.

The second natural watercourse within the Rezone Property collects drainage from Subarea 3 and is located in the south-west portion of the South Campus. This area generally flows east to west towards a large wetland area herein referred to as the 'South Wetlands'. No outlet for this watercourse could be located. A culvert is reputed to direct runoff from the wetlands under the Lehigh Valley Trail to a drainage ditch that runs south to Furlong Creek west of the trail. The culvert could not be found by multiple parties and is believed to be completely plugged and/or buried. The bottom of this subarea/watercourse contains a large area of standing water and storage potential. The standing water exhibits stagnant behavior and discharges through slow ground infiltration to the west and evapotranspiration. A natural ridge separates the south wetland drainage area from the Furlong Creek drainage area to the south. A drainage swale runs along the east side of the Lehigh Valley trail berm connecting the Furlong Creek and South wetland drainage areas. The swale has a natural high point at the ridge and directs runoff in opposing directions from this point. Large storm events that exceed the capacity of the storage area surmount the ridge point in the swale and flow south to the Furlong Creek drainage area.

The third natural watercourse collects drainage from Subarea #4 & #5 and discharges to Furlong Creek, a tributary of Red Creek. This area consists of the southern portion of the Rezone Area, north of the residential properties on Crittenden Road. Furlong creek crosses the Lehigh Valley Trail before discharging to Red Creek. The topography on the southeast edge of this section of the stream slopes to the west, while slopes on the northwest side of this section incline in a southeastern direction towards Furlong Creek. There is a second watercourse from the northwest that confluences with Furlong Creek. Runoff entering the watercourse at the forked section predominantly originates from regions to the north with slopes directed southeasterly. Refer to Figure 3.1 for a map of the drainage areas. This figure is also provided as B-2 in Appendix A.

Refer to the Figure below for the Existing Conditions Drainage subareas.



Refer to the Table below for the Existing Conditions Runoff Rates.

Drainage Area	Area (acres)	Weighted CN*	Tc (hrs)	Design Storm	Existing Run off (cfs)
Subarea 1 Northern Red Creek Tributary	44.98	82	0.75	1-yr 2-yr 10-yr 25-yr 100-yr	21.4 27.9 53.8 66.4 87.1
Subarea 2A Erie Canal via NYSDOT Detention Pond	17.71	86 to swale84.9 direct discharge	0.5 to swale0.2d irect discharge	1-yr 2-yr 10-yr 25-yr 100-yr	15.5 19.4 34.6 41.7 53.2
Subarea 2B Erie Canal via Existing U of R Detention Pond	34.19 (onsite) 44.0 (offsite)	81.8 (onsite) 85 (offsite)	0.7 (onsite) 0.5 (offsite)	1-yr 2-yr 10-yr 2 5-yr 100-yr	9.8 10.8 53.7 81.4 106.8
Subarea 2C Erie Canal via I-390 Storm Sewer System	8.38	80	0.2	1-yr 2-yr 10-yr 25-yr 100-yr	7.6 10.0 19.7 24.4 32.0
Subarea 2D Erie Canal via Murlin Drive Storm Sewer	5.74	83.7	0.2	1-yr 2-yr 10-yr 25-yr 100-yr	6.9 8.8 15.8 19.2 24.5
Subarea 3 Furlong Creek by South Wetland	39.1	86	0.3	1-yr 2-yr 10-yr 25-yr 100-yr	41.4 51.5 90.4 108.5 137.7
Subarea 4 Furlong Creek	31.0	78	0.5	1-yr 2-yr 10-yr 25-yr 100-yr	14.2 19.4 41.1 51.7 69.5
Subarea 5 Lilac Park Subdivision; drains to Furlong Creek	41.5	73	0.6	1-yr 2-yr 10-yr 25-yr 100-yr	9.8 30.3 36.9 48.5 68.1

*The Curve Number (CN) shown is a weighted calculation based on percentages of undeveloped ground cover and impervious surfaces per subarea. Refer to the Drainage Report in Appendix A for the drainage computations.

Historical flooding has been experienced by the residential property owners along the north side of Crittenden Road. These properties are located within the Furlong Creek drainage area #4. Furlong Creek has a large upstream drainage area consisting of dense natural vegetation and relatively flat topography. Only a small portion of this drainage area resides on the U of R South Campus. Furlong Creek is restricted at the Lehigh Valley trail location by a 2-ft by 2-ft stone culvert that passes under the trail. Upstream of the culvert, the Furlong Creek flow area

is not well defined into a channel until further upstream. There is a swale that runs parallel to the residential rear property line's that collects this drainage and routes it to the culvert. North of this flooding area is a drainage area located on the U of R property referred to in this report as Drainage Area #3. A swale runs along the Lehigh Valley embankment and connects this area to the Furlong Creek drainage area to the south. A well defined ridge separates these two drainage areas except for this swale. The swale has a peak in the bottom elevation of it at the ridge and directs runoff away in opposing directions from the peak. Large storm events would likely overtop this swale high point and direct excess runoff from Drainage Area #3 south to the Furlong Creek drainage area by the swale.

The complete drainage report examined the existing drainage problems both on-site and off-site. Off-site problems, in general, occur south and west of the Rezone Property and occur for a few primary reasons:

- 1) Drainage from areas south of Crittenden Road is being directed toward Red Creek via an enclosed roadside drainage system which surfaces in the form of a small drainage swale in the back yards of the affected Crittenden properties.
- 2) The area between the Rezone Property and the houses on Crittenden Road is a low-lying area and has created a "bowl" effect, whereby water from the south and east and to a lesser extent the north is directed. Water settles in the "bowl" and has difficulty escaping because of the lack of topographic relief.
- 3) The drainage system between the Rezone Property and Red Creek lacks topographic relief; there is less than 12-inches of fall between the Rezone Property and Red Creek. The lack of relief slows conveyance, as have obstacles such as vegetated drainage channels and debris. The drainage ways beneath the Lehigh Valley Recreational Trail were cleared out as part of the Lehigh Valley Recreational Trail improvements.

A portion of the drainage that flows toward the problem area crosses the rezone property, but the majority of the flow to Furlong Creek comes from off-site areas to the east and south of Crittenden Road. The portion of the Furlong Creek drainage area that is located on the rezone property primarily consists of undeveloped natural ground cover with the exception of 2.75 acres. These 2.75 acres are comprised of the lower five (5) Whipple Park apartment buildings and a portion of the parking lots and sidewalks. This drainage is collected in a closed conduit storm sewer system that discharges to the south of these buildings. The discharge is directed by a swale to Furlong Creek.

The Rezone Property is not located in the 100-yr floodplain as shown on the Federal Emergency Management Agency (FEMA) floodplain maps (Community – Panel No: 36055C0332G, Effective Date: August 28 2008). The Red Creek Floodplain extends to the western edge of the Lehigh Valley Trail approximately 500-ft north of Crittenden Road (approximately where Furlong Creek passes

through a culvert beneath the Lehigh Valley Trail). There will be no future development within the floodplain boundaries. Any and all impacts to flood storage volume will be compensated for on site. A full drainage report is included as Appendix A.

C. Terrestrial and Aquatic Ecology

Woodlots

Woodlot Tree Survey information was presented in the original DGEIS. Please refer to the November 2005 DGEIS Section V. C. Page 19.

In order to determine changes to the Town of Brighton Woodlot EPOD, Urban Forestry, LLC updated the tree survey in the same manner as the survey they originally conducted in 2005. The tree survey update was performed in only those areas where impacts are proposed according to the Conceptual Grading Plan (Appendix G) and the associated Master Plan.

As part of the tree survey update, the location of significant trees, along with their condition rating, were identified. This information has been included on Figure 8 with additional back-up for the overall survey update located in Appendix B.

Areas of old growth habitat have also been identified. A diagram showing the areas of old growth habitat and the areas of existing Woodlot EPOD can be found as Figure 7. A report pertaining to the old growth habitat on the South Campus site is included in Appendix B. This report was used to delineate the areas of old growth habitat, and to subsequently revise the master plan so as to not impact those areas.

The updated Master Plan showing an overlay of the significant tree locations and old growth habitat areas is included as Figure 9.

Wetland Delineations

The U of R completed follow-up Wetland Delineation work in 2005-2007 upon receipt of DGEIS feedback from the US Army Corps of Engineers and the NYS DEC.

The U of R received comments from the New York State Department of Environmental Conservation (NYS DEC) after submission of the DGEIS. A letter from the NYS DEC dated January 17, 2006 identified a portion of the wetlands on University land (Wetland G) as contiguous to off-site DEC wetlands. The DEC stated its intent to claim jurisdiction over these wetlands. The University's plan was to avoid and buffer this wetland area, regardless of the agency jurisdiction.

The University's wetland consultant walked the site with representatives of both the NYS DEC and the US Army Corps of Engineers to review the wetlands on site.

The wetlands areas (state and federal) were reflagged, resurveyed and remapped (see Appendix C). The revised wetland maps and corresponding documentation verifying modifications to the wetland mapping were submitted to both agencies and are included in Appendix C.

Since more than 5 years has passed since the wetlands were delineated, validation has expired. Therefore, the University had the wetlands re-delineated in 2013 to determine if any changes have occurred since the 2005 delineations. The wetlands were flagged and resurveyed in October 2013. Updated wetland maps are included in Appendix C. The boundaries remained nearly the same, and a few, small additional wetland areas were identified and mapped.

D. Land Use and Zoning

Current Zoning in the South Campus

The existing zoning of the study area is residential, with permitted lot sizes ranging from 7,000 square foot lots in the southern portion of the property to 13,500 square foot minimum lot sizes in the northern portion. Under existing zoning the maximum buildout of the study property is approximately 140 units, assuming 80 percent of the non-developed land was developed. An 80 percent development assumes 20 percent of the land is set aside for roadway infrastructure, stormwater management areas, and lands unsuitable for development.

The current land use of the study area includes:

- Vacant land north of East River Road and west of Kendrick Road. An approximately three acre portion of this property was removed from the U of R holdings for the development of an RG&E sub-station to serve the U of R and areas of the Town of Brighton.
- One existing office building north of East River Road and east of Kendrick Road (48,700 gross square feet) which serves as offices for University Facilities and Services, including associated drive and parking areas.
- Two existing office building complexes: One for the Advancement and Alumni Center (AAC), the former St. Agnes complex (133,191 gross square feet), and one for the Laboratory for Laser Research (Laser Lab, 297,571 gross square feet). Each of these facilities is located south of East River Road (AAC to the west of Murlin Drive and the Laser Lab to the east), and both include associated drives and parking areas.
- Whipple Park graduate housing in the south east corner of the property with 33 buildings and associated drives and parking. These building comprise a total of 338,600 gross square feet.
- All other areas are open space

University Lease land in the Town of Brighton

The University currently leases a total of 694,265 square feet of space in the Town of Brighton as shown in Table 3, below. The November 2005 DGEIS reported a total of 388,614 square feet of space, so the amount of U of R lease space in Brighton has nearly doubled since 2005.

The size of the office spaces and terms of the leases vary for each of the 39 separate leases that the University maintains.

University Leases in Town of Brighton

Address	Rentable Square Feet	Lease Expiration Date
1 Johnsarbor Drive West,	375	month-to-month
100 Meridian Centre,125	6,560	30-Sep-15
120 Corporate Woods,	31,833	28-Feb-19
135 Corporate Woods,100, 160, 350	45,406	28-Feb-19
155 Corporate Woods,130,100, 150, 180	27,867	28-Feb-19
160 Sawgrass Drive,120	3,000	28-Feb-20
160 Sawgrass Drive,130	5,168	31-Mar-22
160 Sawgrass Drive,150	6,703	31-Mar-22
175 Corporate Woods,225,100, 110	16,528	28-Feb-19
180 Sawgrass Drive,ASC, 1st Floor	52,494	31-Aug-23
180 Sawgrass Drive,Non-ASC, 2nd Floor	20,365	31-Aug-23
1815 Clinton Ave South,440	1,500	31-Jul-17
200 White Spruce Blvd,204	1,615	31-Mar-14
200 White Spruce Blvd,220	6,306	31-Dec-17
200 White Spruce Blvd,Ste 100 - Lab	1,242	31-Jan-14
2030 Monroe Avenue,Lower level -Lab	800	month-to-month
2180 Clinton Ave South, A	10,376	31-Aug-19
2180 Clinton Ave South, B & C	5,712	30-Sep-21
2180 Clinton Ave South, D	740	30-Jun-14
2180 Clinton Ave South, Lower Level	3,559	30-Sep-16
2255 Clinton Ave South,	2,650	31-Jul-14
2337 Clinton Ave South,	12,000	31-May-21
2365 Clinton Ave South,2nd Floor	20,337	31-Jan-14
2400 Clinton Ave South, Bldg F	4,875	31-Mar-17
2400 Clinton Ave South, Bldg G	27,125	31-Jan-16
2400 Clinton Ave South, Bldg H	55,572	31-Aug-14
2611 West Henrietta Road,	33,000	30-Sep-14
2613 West Henrietta Road,	28,786	30-Apr-20
2615 West Henrietta Road,	22,074	30-Apr-14
2617 West Henrietta Road,	12,754	30-Jun-15
2619 West Henrietta Road,	26,692	30-Aug-22
2621 West Henrietta Road,	1,556	31-Aug-14
30 Corporate Woods,	62,096	28-Feb-19
400 White Spruce Blvd, Bldg A	9,400	30-Nov-16
400 White Spruce Blvd, B	4,118	30-Jun-17
4901 Lac De Ville Blvd, Bldg D	102,224	31-Jan-17
496 White Spruce Blvd.	2,356	31-Jul-14
919 Westfall Road, Bldg C, Suites 200, 210,215, 205, 220	11,464	28-Feb-14
995 Senator Keating Blvd, Bldg E, Suite 200	7,037	31-Dec-14
Total	694,265	

** The Corporate Woods leases are for administrative space, the balance of the leases are for medical office space.*

As demonstrated in the table above, the University's lease agreements contain a variety of leased areas and have lease expiration dates that range from April 14, 2012 through August 31, 2023.

E. Historical and Archeological Resources

This section of the DGEIS remains unchanged, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section V. E. Page 28.

F. Traffic / Transportation Network

Transportation Network

The existing Traffic/Transportation Network described in the DGEIS remains the same, with minor modifications as outlined below:

- East River Road: NYS DOT has constructed a new southbound on-ramp to I-390, a roundabout at the intersection of Kendrick Road and East River Road, and associated roadway improvements.
- Kendrick Road: NYS DOT is currently designing a new northbound on-ramp to I-390. Work will be completed in 2014.

The NYS DOT's I-390 Plan is included as Appendix D.

A full Traffic Impact Study (TIS) was completed as part of this document and is included in Appendix D. The TIS study area includes 32 intersections; the traffic analysis examines the traffic volumes and potential impacts of the full build scenario. Traffic volume projections in the study area were coordinated with NYS DOT, Monroe County DOT and the Genesee Transportation Council.

Over the past several years, additional studies have been completed and approved for other projects within the area. The TIS for the CityGate development (southeast corner of Westfall and East Henrietta Road) has been approved by Monroe County Department of Transportation (MCDOT) and is included in the background analysis for this study.

The revised TIS was completed to complement the Master Plan. The TIS uses an existing analysis and a full build at 20 years. The revised TIS also provides a 5-year time frame build analysis.

The Rezone Property is primarily accessed from East River Road, at Murlin Drive, opposite Kendrick Road. There are several major roadways that serve the South Campus property including the following: Interstate Route 390, West Henrietta Road, East Henrietta Road, and Crittenden Road. The following is a description of major roadways within the study area, which were examined as part of this analysis.

NY Route I-390:

I-390 traverses north-south in the vicinity of the site and is considered a principal arterial Expressway. As documented by the New York State Department of Transportation, I-390 carried approximately 75,717 vehicles per day west of exit 15 (junction with I-590) in 2008.

NY Route I-590:

I-590 traverses north-south in the vicinity of the site and is considered a principal arterial interstate. As documented by the New York State Department of Transportation, I-590 carried approximately 75,116 vehicles per day east of exit 15 (junction with I-390) in 2008.

NY Route 15 (West Henrietta Road):

NY Route 15 traverses north-south and is considered a principle arterial. As documented by the New York State Department of Transportation, NY Route 15 carried approximately 34,107 vehicles per day south of Brighton-Henrietta Road in 2009 and 35,417 vehicles per day north of Brighton-Henrietta Road in 2008. North of NY Route I-390, in 2008, NY Route 15 carried approximately 19,179 vehicles per day; and north of NY Route 15A, in 2007, NY Route 15 carried approximately 26,429 vehicles per day.

NY Route 15A (East Henrietta Road):

NY Route 15A traverses north-south and is considered a principle arterial. As documented by the New York State Department of Transportation, NY Route 15A carried approximately 27,105 vehicles per day north of Brighton-Henrietta Road in 2008. South of Westfall Road, in 2009, NY Route 15A carried approximately 30,534 vehicles per day; and south of NY Route 15, in 2007, NY Route 15A carried approximately 10,653 vehicles per day.

Traffic volume turning movement counts were conducted for all the studied intersections during the weekday peak hours of 7:00AM-9:00AM and 4:00PM-6:00PM. TYLI performed traffic counts on November 14-17, 2006 at the following intersections:

- Elmwood Avenue @ Kendrick Road
- Elmwood Avenue @ East Drive (conducted on February 1st, 2007, and March 10, 2010)
- Crittenden Blvd. @ East Drive (conducted on February 1st, 2007)
- Elmwood Avenue @ South Avenue
- E. Henrietta Road @ Westfall Road
- Kendrick Road @ Lattimore Road/Lot 1
- Kendrick Road @ Westmoreland Drive
- Kendrick Road @ E. River Road

In addition, pedestrian and traffic volume counts were collected at the intersection of Elmwood Avenue and the School of Medicine and Dentistry Building Pedestrian Crossing on November 8, 2007 and December 12, 2007.

Traffic volume turning movement counts were obtained from Bergmann Associates from the Mt. Hope/E. Henrietta Study. The counts were performed by SRF & Associates in 2006 at the following intersections:

- Mt. Hope Avenue @ Elwood Avenue
- Mt. Hope Avenue @ Crittenden Blvd/E. Henrietta/Fort Hill Terrace
- Mt. Hope Avenue @ Lattimore Road
- Mt. Hope Avenue @ Westmoreland Drive/Westfall Road
- E. Henrietta Road @ South Avenue

Traffic volume turning movement counts were obtained from the New York State Department of Transportation conducted in March 2005 at the following I-390 ramp intersections:

- I-390 NB Off/On Ramps @ Rt. 15A
- I-390 SB Off/On Ramps @ Rt. 15A

Traffic volume turning movement counts were also obtained from the University of Rochester South Campus IPD Rezoning Study dated September 2005, performed by TYLI at the following intersections:

- I-390 NB On Ramp @ Rt. 15
- I-390 SB Off Ramp @ East River Road
- East River Road @ Rt. 15
- Kendrick Road @ Crittenden Blvd./Lot 1

The remaining traffic volumes and turning movement counts were obtained from the July 2001 Southern Corridor Study, presented in Appendix 'F' of the TIS located in Appendix 'E' of the DGEIS. These counts were recorded between April 21st and May 9th, 1997 by The Sear-Brown Group during the weekday hours of 7:00AM-9:00AM and 4:00PM-6:00PM. The peak hours occurred from 7:30 AM - 8:30 AM and 4:30 PM - 5:30 PM.

The existing traffic volumes were obtained by applying a 1.0 percent growth rate per year to the baseline traffic volumes to account for normal growth throughout the development area. This growth factor was established by Monroe County Department of Transportation and was based on future land use projections. The existing traffic volumes for the weekday morning and weekday evening peak hours are shown in Figures 4A and 4B, in Appendix 'C' of the TIS located in Appendix 'E' of the DGEIS.

Additionally, the Southern Corridor Mobility Study evaluated the current and future operational needs of I-390/NY 15/NY 15A interchanges. Proposed improvements that will have an effect on the future traffic patterns within the study area including construction of the new I-390 Southbound exit ramp at Brighton-Henrietta Town Line Road (BHTR). Also proposed is the rehabilitation/reconstruction of I-390 from the Genesee River to I-590, rehabilitation/reconstruction of numerous bridges, new frontage roads, and access ramps for NY 15 and NY 15A, currently under construction. The Southern Corridor Mobility Study looked at several improvement plans and determined Alternative Plan #5 should be pursued, as it provided the most benefit for the cost. This alternative plan and traffic volumes from the Southern Corridor Mobility Study are provided in Appendix 'F' of the TIS located in Appendix 'E' of the DGEIS.

An intersection capacity analysis was performed for the signalized and unsignalized intersections in the study area to show existing operating conditions in terms of Levels of Service (LOS). The computer software package SYNCHRO 8.0 was used to analyze each of the studied intersections and to provide an illustrative model of how the intersections work together. The following intersections are currently experiencing poor operating conditions of LOS 'E' or worse:

- NY 15 (W. Henrietta Rd) @ I-390 NB on Ramp (PM LOS E),
- NY 15 (W. Henrietta Rd) @ East River Rd (PM LOS F),
- NY 15A (E. Henrietta Rd) @ I-390 NB on Ramp (AM LOS F),
- NY 15A (E. Henrietta Rd) @ I-390 SB on Ramp (PM LOS F),
- NY 15A (E. Henrietta Rd) @ Crittenden Rd (AM LOS E),

In April 2010, the University Planned Development District #10 was approved by the City of Rochester. Because specific projects and future growth plans are unknown beyond the 5-year timeframe, the PD #10 Ordinance approved by the City includes the following traffic impact study language in the review and approval section for future building projects: “ . . . ***the 2010 PD #10 Traffic Impact Study shall be updated or replaced every five years, commencing in 2015.***” Additionally, the University will continually work with the reviewing agencies in both the Town and the City during site plan approval processes for individual building applications to ensure that the anticipated traffic improvements outlined in this study are on track as the future growth of the University evolves.

The University proposes to submit the traffic study update to the town of Brighton, and will include language in the proposed Town of Brighton IPD Ordinance for submittal of the 5-year traffic study updates.

In order to confirm that the traffic counts (from 2006 and some older) are still valid, new traffic counts were conducted in early December 2013 for three of the intersections in the Town of Brighton. Traffic counts taken at West Henrietta

Road/Southland Drive, West Henrietta Road/Doncaster Road, and East River Road/Crittenden Road substantiate the adjusted calculations for those intersection previously presented. The volumes were actually lower than the projected collected volumes for the same time period. The new TIS, including the data collected at the three intersections in December 2013, is included in Appendix E, and has the following key findings:

The proposed 20-year development of University properties in the City of Rochester and Town of Brighton is anticipated to generate 4,200 (approximately) new vehicle trips during the weekday morning and weekday evening peak hours (the peak hour is the busiest traffic-hour of the day). With the recommended roadway improvements in place, each of the studied signalized intersections is anticipated to operate at an acceptable level of service, i.e., without significant added delay to drivers, for the 5-year and 20-year (build) conditions.

Trails/Pedestrian and Bicycle Accommodations

The Town of Brighton's recently completed Pedestrian and Bicycle Master Plan identifies the Lehigh Valley Trail, running along the western edge of the South Campus site, as a major north-south trail link within the Town. The trail currently serves as a link between South Campus and the Rochester Institute of Technology (RIT), as it runs from East River Road, south to Brighton Henrietta Town Line Road, entering the Town of Henrietta where it cross Jefferson Road and picks back up along John Street. When the DOT reconstructs the Kendrick Road Bridge (currently in the design stage) the bridge deck will be widened to provide improved pedestrian and bicycle accommodation over the Erie Canal where it connects with the Erie Canal Heritage Trail, the trail network through the U of R's River Campus, and the Genesee Riverway Trail beyond. A depiction of these trail connection with relation to South Campus can be found on Figure 11.

G. Utilities / Energy

With the exception of the information provided below, this section of the DGEIS remains unchanged, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section V. G. Page 31.

Additional public water system analyses were completed in June 2013 and in September 2013 in support of the anticipated Imaging Building and future growth on the South Campus. A summary of the completed study is outlined below, and the September 2013 report is included as Appendix 'F'.

The University analyzed options for providing water service to the proposed Imaging Science building area along East River Road. The water system was modeled and the pressure impact on the existing water service mains was

analyzed when domestic and fire water service lines are connected to the existing 8-inch loop surrounding the Laboratory for Laser Energetics (LLE) building. A model showing the pressure impacts of adding a second 8-inch loop connecting the 8-inch main on Murlin Drive to the main on East River Road was developed.

Analysis

Existing Loop

The existing 8-inch loop is the last connected service at the end of an 8-inch main running from west to east along East River Road. The 8-inch line runs south from the road main, splitting at the northwest end of the LLE lot and encircling the building. The Domestic water service enters the building on the northwest side, and three separate fire service entrances serve the three main areas of the building.

Proposed 8-inch Loop

The analysis investigated tapping into the 8-inch main on Murlin Drive (southwest of LLE), then heading northeast towards East River Road and extending to the valve at the east end of the existing 8-inch service main.

Proposed 8" Secondary Tie-In

Another option investigated requires tapping into the 8-inch main running along Murlin as outlined above, but back-connecting to the LLE loop rather than running in a complete secondary loop back to East River Road.

Both options were modeled using flow demand provided by the University for hydrants located around LLE.

The following assumptions were used in developing the model:

- A significant volume of domestic water is used in the Laboratory for Laser Energetics building at certain times of the year. This volume, primarily process and cooling makeup water, would continue to draw in the event that fire pumps were brought into operation. These flows are part of the analysis model. Other domestic water demands (for the Imaging and potential future buildings) are not shown concurrent with fire demands.
- Domestic water for the Imaging Science building and flows for a potential future office building were included.
- Fire protection demands for the Imaging Science building and a potential future office building were used.
- Hydrant flow data provided by the University shows available static pressure of 40 PSIG (at zero flow), and pressure drop of 10 PSI at a flow of approximately 400 GPM. The flow model reflects available inlet pressure based on those two points.

After modeling the expected flows and reviewing with the U of R and the Monroe County Water Authority (MCWA), the recommendation is that a cross connection be installed between the main on Southland Drive and that on East River Road, from which the proposed Imaging Building and future buildings would be served. The hydraulic model confirmed that the proposed systems are capable of serving the existing, new and proposed future domestic and fire flow loads without adversely affecting pressures in the existing services along East River Road, Murlin Drive, or Southland Drive.

A fire pump will need to be installed to maintain adequate pressures for fire flows at proposed buildings, along with domestic water boosters and pressure tanks.

H. Community & Neighborhood Character

This section of the DGEIS remains unchanged, and is therefore incorporated by reference. Please refer to DGEIS Section V. H. Page 41.

I. Police/Fire/Ambulance Service

Police

The Brighton Police Department (BPD) is staffed by 40 sworn officers and 12 full and part-time civilians. The number of officers has remained constant for the last 20 years. BPD has a well-earned reputation as a professional police force that is responsive to the needs of Brighton residents and businesses and has instituted numerous programs to interact with, educate and inform the Brighton community. Based on data from University Security Reports, the South Campus averaged 87 incidents a year over the past five years (2008 – 2012), which is a considerable drop from the number of calls reported in the 2005 DGEIS. Not all of these incidents involved a response by BPD – most were handled by U of R security - but were listed as actions that might warrant a response from BPD. These incidents include responding to intrusion alarms and criminal-type complaints.

The University of Rochester has recently undertaken a program to transition its security staff to Peace Officers. By March of 2014, the University will be staffed with over 40 sworn officers, including 25-30 uniformed Peace Officers, a Senior Patrols Manager, 10 Sworn Supervisors, a Crime Prevention Officer, and a Special Investigator. The first class of Officers – a class of 23 persons – were sworn in and ready for service in October 2013.

The table below summarizes all of the calls made to one of the emergency response agencies between 2008 and 2012 for the South Campus (including the LLE building, the River Road Buildings, and the Whipple Park apartments). A vast majority of these calls were responded to by University forces and did not require responses from Town forces.

Table 9 – Emergency Responses for South Campus Property (6-19-2013)

SECURITY REPORTS	2012	2011	2010	2009	2008
Fire Investigations	4	2	0	6	5
Fire Alarms	99	96	123	443	498
Medical Assistance	6	2	7	7	4
Agency Assist	4	8	3	7	4
Criminal *	8	0	0	23	22
Intrusion Alarms	52	80	99	64	85
LLE Vault **	[0]	[0]	[0]	[0]	[0]
EH&S Issues	0	2	7	6	6
	173	190	239	556	624

* number of criminal incidents - not all involved a Brighton PD response

** vault is likely the only area that would require a Brighton PD response

Fire

The study area is located in the West Brighton Fire Protection District. The West Brighton Fire Protection District is one of two Fire Districts within the Town. The West Brighton Fire Protection District contracts with the West Brighton Fire Department, Inc. annually to provide fire protection and first responder emergency medical response. In addition, the Town contracts annually with the City of Rochester Fire Department for immediate response to reported structure fires and automatic fire alarms in specified commercial buildings such as hotels and high-rise office buildings.

The Town no longer has a contract with the West Brighton Fire Department, Inc. The Town is currently negotiating a contract with the Henrietta Fire District.

Ambulance Service

Brighton Volunteer Ambulance (BVA) is staffed by 100 trained professional responders. Approximately 16% of BVA's 2012-2013 budget is provided through special assessments on Brighton properties.

The Town also contracts annually with Rural-Metro Medical Services to provide EMS responses within the district between the hours of 6PM and 6AM. See the table above, for additional information related to the number of medically related responses to the South Campus properties.

VI. Potential Significant Adverse Impacts/Mitigation Measures

This section of the S-DGEIS examines potentially significant adverse Impacts associated with future growth at the South Campus, along with identified mitigations measures. References are made to specific sections of the original DGEIS document that remain unchanged. Supplemental information and studies that were completed as part of this document are included.

A. Topography, Geology & Soils

This section of the DGEIS remains unchanged except as described below, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section VI. A. Page 44.

Below is a brief summary comparison of the potential impacts of the DGEIS Concept Plan as compared to the current Master Plan Concept plan.

DGEIS Concept Plan	S-DGEIS / Master Plan
<p>The Rezone Property contains areas that may preclude development due to soils conditions – i.e., wetlands in low lying areas.</p> <p>Watercourses, wetlands and wetland buffer areas will be avoided.</p> <p>Areas of disturbances will be minimized as much as practical, and Best Management Practices (BMP’s) for pollution prevention and erosion and sediment control practices will be employed. Disturbed areas will be stabilized within 21 days.</p>	<p>Similar to the concept plan included in the DGEIS, areas of disturbance will be minimized, watercourses, wetlands and wetland buffer areas will be avoided, and Best Management Practices (BMP’s) will be employed. As each future project is proposed, potential impacts will be evaluated on a site-by-site basis as part of the review and approval process by the Town.</p>

Mitigation

Areas of disturbance will be minimized, watercourses, wetlands and wetland buffer areas will be avoided, and pollution prevention efforts /Best Management Practices (BMP’s) will be employed during construction and for permanently

installed stormwater mitigation features to control sediment and soil erosion. The primary objective of the BMPs is to prevent sediment from flowing to surface waters and to ensure that erosion is minimized.

As each future project is proposed, potential impacts will be evaluated on a site-by-site basis as part of the review and approval process by the Town.

At the time of construction, the BMP measures to be installed by the University will conform to the most current New York State Standards and Specifications for Erosion and Sediment Control. The techniques for controlling erosion and sediment during construction will include the following:

- Providing sediment control practices located downstream of construction activities. The sediment control practices typically include silt fence, earthen diversion dikes, temporary swales, and sediment basins/traps. The downstream side of each practice will be undisturbed ground.
- All disturbed areas will be stabilized within 21 days when construction activities have temporarily or permanently ceased.
- Storm sewer inlet structures, will be protected from sediment deposition.
- Swales and/or channels will include stone check dams to reduce the velocity of stormwater to non-erosive velocities

Please refer to the Drainage Report in Appendix A for additional details on the proposed Sediment and Erosion Control Measures.

B. Water Resources, Stormwater Runoff

The Drainage Report was updated and is included with this document as Appendix A. A summary of the report is outlined below, and includes the following sections:

Stormwater Management – watershed analysis, design strategies and land designations

The Drainage Report addresses the existing site stormwater runoff conditions, as well as probable stormwater mitigation measures and pollution prevention devices that would be required for potential development on the 180 acre Rezone Property. The analysis is based on probable use and compliance with the Town of Brighton Code, the Irondequoit Creek Watershed Collaborative, and the Phase II requirements of the New York State Pollutant Elimination System (SPDES) General Permit GP-0-10-001 for stormwater discharges associated with construction activity. Refer to Figure 1 of Appendix A for a general location map.

The report describes the existing land use, topography, watercourses, drainage patterns, existing drainage problems, and all areas draining through the proposed Rezone Property. Additionally, the report is intended to assess future post-development drainage conditions, storm water runoff requirements, and to provide recommendations for alleviating some existing drainage problems. The report describes potential development, possible site limitations, potential impacts to natural resources, runoff quantities, and effects on receiving waters. Potential storm water management facilities are identified, along with an overall approach for design.

The Drainage Report was created with the guidance of the New York State Stormwater Management Design Manual (NYS SMDM) dated 2010 and the New York State Standards and Specifications for Erosion and Sedimentation Control, and documents stormwater mitigation measures to comply with all current requirements.

At the request of the Town, a conceptual plan was developed indicating potential building layouts, densities, and uses. This conceptual plan was outlined in the DGEIS. The Town determined that enough changes had taken place to warrant the preparation of an updated Drainage Study.

Potential Impacts to Natural Resources

Erosion, flooding and water quality concerns are the three main ways that storm water from future development could potentially impact natural resources. The stormwater management facilities and erosion control measures proposed for the site will mitigate these concerns. Potential impacts to specific natural resources are discussed below.

Receiving Waters

The following waters receive runoff from the project:

- Red Creek
- Tributaries to Red Creek
- Furlong Creek
- Erie Canal
- Wetlands

Based on the analysis completed, the potential development, as shown, will not have a negative effect on the receiving waters. The rate of runoff reaching the receiving waters will not increase; any potential future development area will have post-development runoff rates less than or equal to existing peak runoff rates. The proposed plan will also redirect more runoff northerly to the Erie Canal. Each of the natural receiving waters will have a significant reduction in both runoff rate and quantity with the post-developed improvements. The

quality of the runoff leaving the site will be improved as a result of the proposed stormwater management practices which will provide pollutant removal. The proposed stormwater management facilities meet the design standards of the NYS Stormwater Management Design Manual (NYSSMDM) which, for new development, require runoff to be captured, treated, and, to the extent possible, recharged to the groundwater as close as possible to the source of generation. Redevelopment areas will also receive water quality treatment. Temporary erosion control devices will be put in place during construction to minimize any pollutants from potentially reaching the downstream waters.

Additional amenity measures have been identified separate from the proposed re-zone development which, if constructed, will provide some relief to the flooding that has been reported at the rear yards of the properties along Crittenden Road.

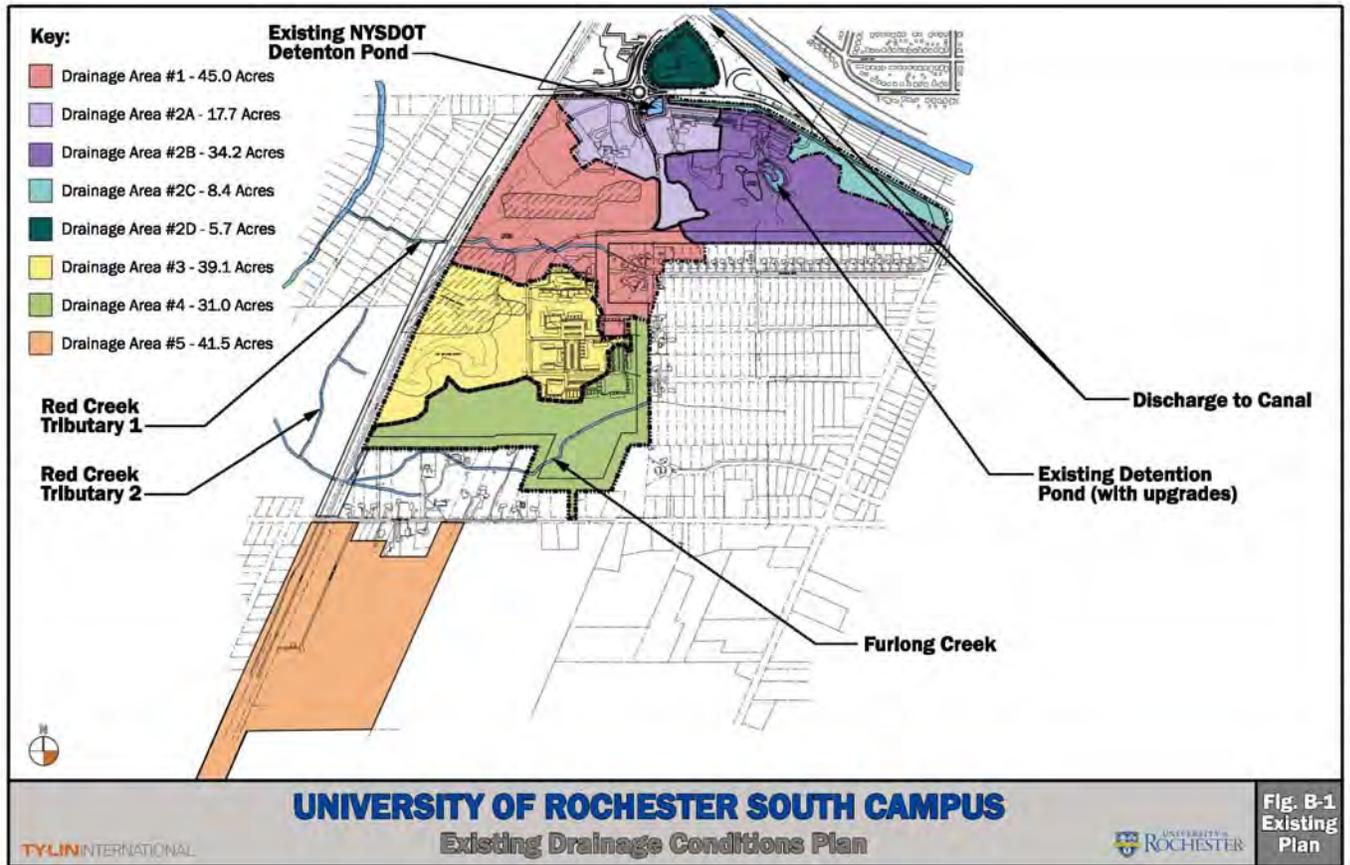
Green Space

Much of the 180 acre South Campus site is undeveloped, and the Master Plan will occupy approximately half of the South Campus area. Out of the 180 acre site, approximately 97 acres are comprised of woodlot. Approximately 57% of the existing woodlot will not be impacted by the future development per the Master Plan, including areas of old growth habitat and wetlands (see Figure 10).

Rezone Property

The Rezone Property study area was divided into 5 separate drainage areas (subareas), as shown on Figure B in the Drainage Report, that define the existing drainage patterns. Subarea 1 is located in the northwest portion of the Rezone Property; Subarea 2 is located in the northeast portion of the Rezone Property; Subarea 3 is located in the middle portion of the Rezone Property, including the Whipple Park Apartments; Subarea 4 is located in the southern portion of the Rezone Property, north of Crittenden Road; and Subarea 5 is located south of Crittenden Road (Lilac Park Subdivision). Within the boundaries of the Rezone Property there are five primary watercourses / drainage ways. The watercourses serve as receiving locations for storm water runoff from the adjacent topography and direct the discharge to the Erie Canal or to Red Creek.

Refer to the Figure below for a diagram of the 5 existing drainage subareas.



Refer to the table on the following page for a summary of the 5 existing drainage subareas.

Drainage Area	Area (acres)	Weighted CN*	Tc (hrs)	Design Storm	Existing Run off (cfs)
Subarea 1 Northern Red Creek Tributary	45.0	82	0.75	1-yr 2-yr 10-yr 25-yr 100-yr	21.4 27.9 53.8 66.4 87.1
Subarea 2A Erie Canal via NYSDOT Detention Pond	17.7	86 (to swale) 84.9 (direct discharge)	0.5 (to swale) 0.2 (direct discharge)	1-yr 2-yr 10-yr 25-yr 100-yr	15.5 19.4 34.6 41.7 53.2
Subarea 2B Erie Canal via Existing U of R Detention Pond	34.2 (onsite) 44.0 (offsite)	81.8 (onsite) 85 (offsite)	0.7 (onsite) 0.5 (offsite)	1-yr 2-yr 10-yr 25-yr 100-yr	9.8 10.8 53.7 81.4 106.8
Subarea 2C Erie Canal via I-390 Storm Sewer System	8.4	80	0.2	1-yr 2-yr 10-yr 25-yr 100-yr	7.6 10.0 19.7 24.4 32.0
Subarea 2D Erie Canal via Murlin Drive Storm Sewer	5.7	83.7	0.2	1-yr 2-yr 10-yr 25-yr 100-yr	6.9 8.8 15.8 19.2 24.5
Subarea 3 No Outlet	39.1	86.1	0.3	1-yr 2-yr 10-yr 25-yr 100-yr	41.4 51.5 90.4 108.5 137.7
Subarea 4 Furlong Creek drainage area	31.0	78	0.5	1-yr 2-yr 10-yr 25-yr 100-yr	14.2 19.4 41.1 51.7 69.5
Subarea 5 Lilac Park Subdivision; drains to Furlong Creek	41.5	73	0.6	1-yr 2-yr 10-yr 25-yr 100-yr	9.8 30.3 36.9 48.5 68.1
Total On Site & Off Site	266.6	-	-	1-yr 2-yr 10-yr 25-yr 100-yr	127 178 346 442 579

As shown in the table on the previous page, Subarea 2B drainage analysis includes drainage from approximately 44-acres of land that run onto the rezone property. The area includes the residential area to the east of the Whipple Park Apartments, containing the residences located along Southland Drive, Sylvia Road, and Doncaster Road. The storm water runoff from this area is collected in a closed conduit drainage system that conveys the storm water to the existing storm water detention pond located east of the Laser Lab.

Existing Drainage Concerns

Residential properties located along the north side of Crittenden Road adjacent to the Lehigh Valley Trail berm experience significant and disruptive flooding in their rear yards. The flooding is from drainage in the Furlong Creek watershed. This watershed is restricted by a box culvert under the trail berm. Upstream of the culvert, the Furlong Creek flow area is not well defined into a channel until further upstream. The Town of Brighton commissioned a Townwide drainage study in 1978 that included Furlong Creek. This study identified the Furlong Creek watershed to be 0.42 square miles. Of this area, approximately 0.35 square miles is located on the east side of the Lehigh Valley Trail (trail) contributing to the flooding. 49% of this area is located on the U of R property however the majority of this area is undeveloped natural land cover. Natural land cover provides relief to flooding by slowing, intercepting and absorbing runoff via the dense vegetation. Only 1% of the 0.35 square mile drainage area is developed (impervious) area on the U of R property. Three amenities have been identified which will remove the U of R developed runoff contribution to the Furlong Creek watershed. Refer to the following section “Post Development Project Impacts to Existing Flooding Problem Areas” for a detailed description of these amenities.

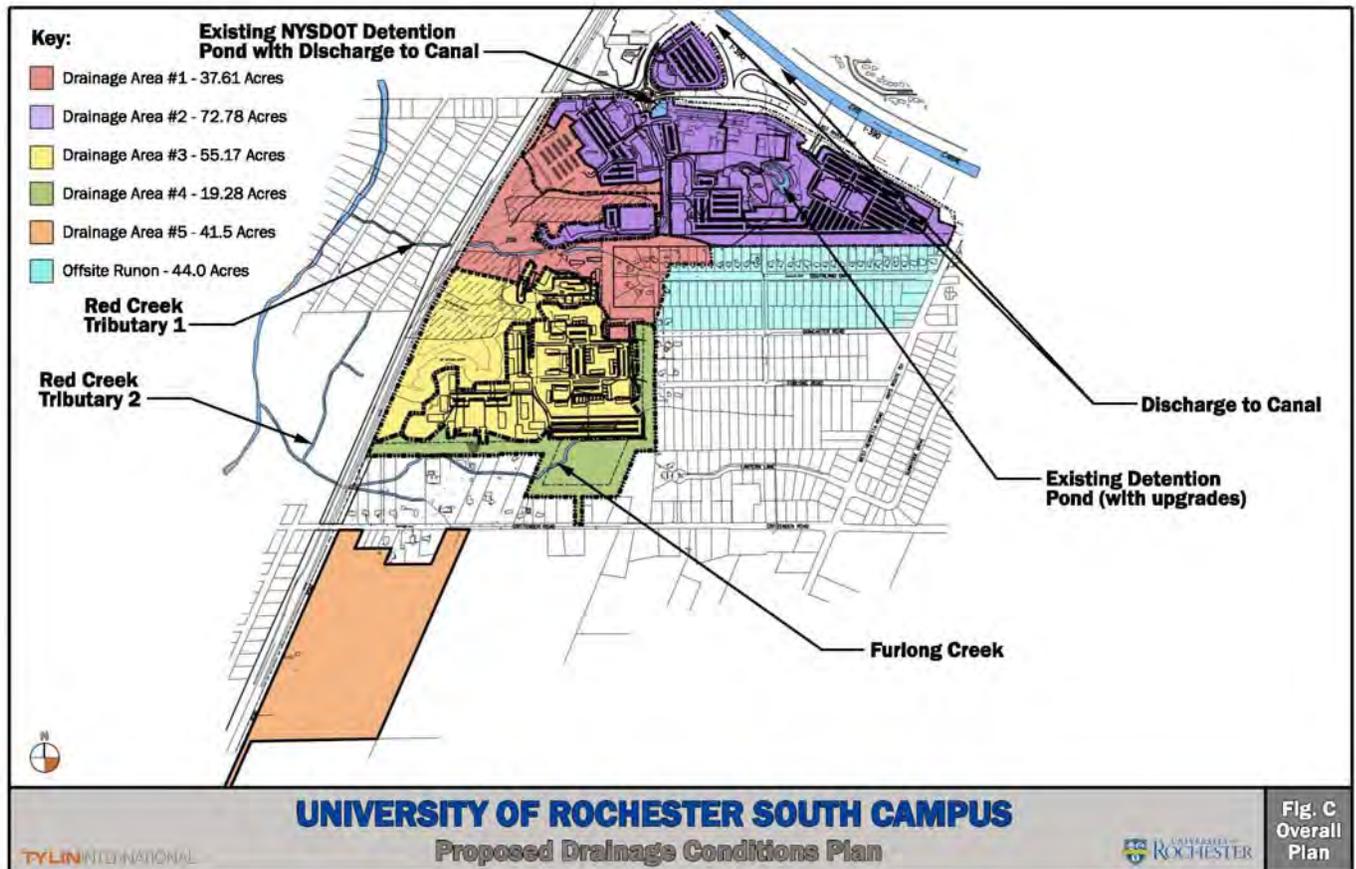
In the same area north of Crittenden Road, but west of the trail berm there is also some flooding problems by the residential properties on Norman and Helen Road. South of the residential area is a 100-year flood zone where ponding would be expected. A drainage ditch directs runoff south from the residential properties through the flood zone to Furlong Creek. Sheet drainage does not always reach the ditch and sometimes causes disruptive flooding to the residential properties.

The portion of the Furlong Creek drainage area that is located on the Rezone Property primarily consists of undeveloped natural ground cover with the exception of a 2.75 acre portion of the Whipple Park apartment complex. Drainage from that area is collected in a closed conduit storm sewer system that discharges southerly to a swale to Furlong Creek.

Future Developed Conditions

The possible development of the Rezone Property (180 +/- acres) was sectioned into the three respective drainage areas where the potential development has been identified. These areas are: Drainage areas. #1, #2, & #3. Drainage area #2 is further divided into four (4) sub areas to reflect the different discharge points via the NYSDOT storm sewer system to the Erie Canal. Drainage area 2A discharges to the existing NYSDOT detention pond. Drainage area 2B outlets from the existing U of R detention pond. Drainage area 2C sheet flows to the storm sewer system in East River Road. Drainage area 2D discharges to the storm sewer system in Murlin drive. Development is not proposed in drainage areas #4 or #5.

Refer to the Figure below for a diagram of the proposed drainage subareas.



There are six main points of interest when planning for, and analyzing, the impacts of the proposed development, as outlined below. Each of the six points of concern for the future development will be effectively mitigated to industry and regulatory standards and will match or be more beneficial than

existing conditions, as summarized below. Further detail of each point follows.

1. **Pre- vs. Post-Development Peak Runoff Rate** – To meet the New York State stormwater design requirements for compliance with General Permit GP-0-10-001, the 1-yr post-developed run-off volume should be detained for 24-hrs, (applicable to new development), or match pre-development rates, (applicable to redevelopment), and the 10-yr and 100-yr post-developed runoff should be attenuated to match existing conditions. The Town of Brighton also requires attenuation of the 100-yr post-development runoff rate to the 25-yr existing runoff rate, as well as controlling lesser events in the same manner.
2. **Post-Development Project Impacts Downstream** – The results of proposed changes should be examined to ensure the hydrologic changes do not have negative impacts downstream of the development. This involves evaluating changes to the runoff volumes and rates.
3. **Pre- vs. Post-Development Peak Runoff Volume** – The results of proposed changes should be examined to ensure that the extra runoff volume generated from the development will be directed to an appropriate location which can accept the additional volume without having negative impacts to the surrounding environment.
4. **Post Development Project Impacts to Existing Flooding Problem Areas** – The results of proposed changes should be examined to ensure they will not exasperate any existing flooding problems in the surrounding area or downstream of the project.
5. **Pre- vs. Post-Development Groundwater Recharge** – New development results in an increase runoff as a result of constructed impervious areas. This increased runoff volume is water that under existing conditions would have infiltrated into the soils contributing to groundwater recharge. The results of proposed changes to groundwater recharge should be examined to ensure the development does not have negative impacts on the surrounding environment which is dependent on the groundwater.
6. **Pre- vs. Post-Development Pollutant discharge** – Undeveloped areas which are not impervious or maintained lawn areas typically have very low pollutant discharge rates. Conversion of these areas to impervious surfaces or lawn covers has the potential to increase the pollutant discharge to receiving waters as a result of oil & gas spills, mechanical systems condensate, lawn fertilizers, etc. Practices should be implemented which are capable of providing pollutant removal rates to at or below existing conditions, prior to discharge to a receiving water.

In accordance with SPDES General Permit GP-0-10-001 (SPDES GP), a Storm Water Pollution Prevention Plan(s) (SWPPP(s)) must be developed outlining the previously discussed requirements and design guidelines as development occurs within the action area. The SWPPPs shall incorporate design standards from the Town of Brighton Code and the Irondequoit Creek Watershed Collaborative.

The development area consists of both new development and redevelopment areas. Redevelopment areas constitute any areas that had existing impervious surfaces which will be developed to be either an impervious or pervious surface or existing pervious surfaces which will remain pervious. Redevelopment areas fall under the NYSDEC Stormwater Management Design Manual (SMDM) Chapter 9 Redevelopment regulations. These requirements call for the post-developed runoff rate from the 1, 10 & 100-yr storm frequencies to be attenuated to existing conditions. Water quality volume is a certain volume representing 90% of the average annual runoff volume, which typically contains the most pollutants. 25% of the water quality volume calculated for the redevelopment area is required to be provided in the proposed development and with a standard practice. A standard practice is one that provides 80% Total Suspended Solids (TSS) removal and 40% phosphorus removal. Runoff reduction volume (RRv) is not required for redevelopment areas. New development areas constitute any areas that had existing pervious surfaces which will be developed to an impervious surface. New development areas fall under the SMDM Chap. 4 Unified Sizing Criteria, Chap. 5 Green Design and Chap. 6 Performance Criteria regulations. These requirements call for the post developed runoff volume from the 1-year storm event to be detailed over 24 hours to provide downstream channel protection volume and the 10 & 100-yr storm frequencies to be attenuated to existing conditions. The Town of Brighton further requires attenuation of the 100-yr post-developed runoff rate to the 25-yr pre-developed rate and so forth for all lesser events. This criteria applies to both new development and redevelopment areas. New development also requires a portion of the WQv to be provided through Runoff Reduction Volume (RRv) practices. RRv practices include a combination of planning practices and infrastructure practices which reduce runoff volume by reducing generation of the volume, redirecting the volume to alternative sources or promoting groundwater recharge of the volume. Each of these practices provides a certain amount of RRv credit. A minimum RRv requirement is required which is dependent on the infiltration capacity of the soils. The goal is to provide the WQv completely through RRv practices. This goal can be difficult to achieve particularly in areas with poorly infiltrating soils and high ground water tables. Figures D-F in Appendix A of the Drainage Report delineates impervious areas that are considered redevelopment. The remaining impervious areas represent new development.

Estimated development per drainage area is shown in the table on the following page.

Proposed Drainage Areas

Drainage Area	Area (acres)	Weighted CN*	Tc (hrs)
Subarea 1 Northern Red Creek Tributary	6.35 (To Pond)	90 (To Pond)	0.3 (To Pond)
	31.26 (Not to Pond)	79 (Not to Pond)	0.7 (Not to Pond)
Subarea 2A Erie Canal via NYSDOT Pond	13.9 (To Bioretention)	91.5 (To Bioretention)	0.2 (To Bioretention)
	4.1 (Not to Bioretention)	91.8 (Not to Bioretention)	0.2 (Not to Bioretention)
	4.3 (Subarea #2E)	91.4 (Subarea #2E)	0.25 (Subarea #2E)
Subarea 2B Erie Canal via Existing U of R Detention Pond	30.9 (To Bioretention)	93.2 (To Bioretention)	0.5 (To Bioretention)
	10.1 (Not to Bioretention)	85.5 (Not to Bioretention)	0.2 (Not to Bioretention)
	44.0 (offsite)	85 (offsite)	0.5 (offsite)
Subarea 2C Erie Canal via I-390 Storm Sewer System	3.78	80	0.2
Subarea 2D Erie Canal via Murlin Drive Storm Sewer	5.7	91.8	0.2
Subarea 3 No Outlet	32.4 (To Bioretention)	88.3 (To Bioretention)	0.2 (To Bioretention)
	22.8 (Not to Bioretention)	87.6 (Not to Bioretention)	0.2 (Not to Bioretention)
Subarea 4 Furlong Creek drainage area	19.3	77	0.5
Subarea 5 Lilac Park Subdivision; drains to Furlong Creek	41.5	73	0.6
Total On Site & Off Site	266.6	-	-

* The Curve Number (CN) shown is a weighted calculation based on percentages of undeveloped ground cover and impervious surfaces per subarea. Refer to the Drainage Report D for the drainage computations.

Existing impervious surfaces cover about 16% of the Rezone Property north of Crittenden Road. The potential development, as shown, would increase this coverage by 22%. The storm water runoff from the potential developed areas will be directed towards local groundwater recharge and water quality practices and regional storm water ponds for runoff rate attenuation. The runoff from undeveloped portions of the site would follow existing drainage patterns into the primary watercourses that flow off-site to Red Creek.

- 1. Pre- vs. Post-Development Peak Runoff Rate** – Will be attenuated to at or below existing conditions in compliance with the General Permit and the Town of Brighton’s design standards.

To meet the NYS stormwater design requirements for compliance with General Permit GP-0-10-001, the 1-yr post-developed run-off volume should be detained for 24-hrs and the 10-yr and 100-yr post-developed runoff should be attenuated to match existing conditions. The Town of Brighton also requires attenuation of the 100-yr post-development runoff rate to the 25-yr existing runoff rate, as well as controlling lesser events in the same manner.

The peak pre- and post-development run-off rate at the bottom of each subarea was calculated by using NRCS TR-55 methodology on Pond Pack, version 10.0, by Bentley Systems. The rainfall depths for the various storm events were taken from the “Rainfall List by County” in Drainage Study Appendix C. *These results show the runoff rates to the wetlands, where applicable, and do not take into account the restrictions from the wetlands outlets.* Refer to the Drainage Report for the complete results of the calculations and analysis.

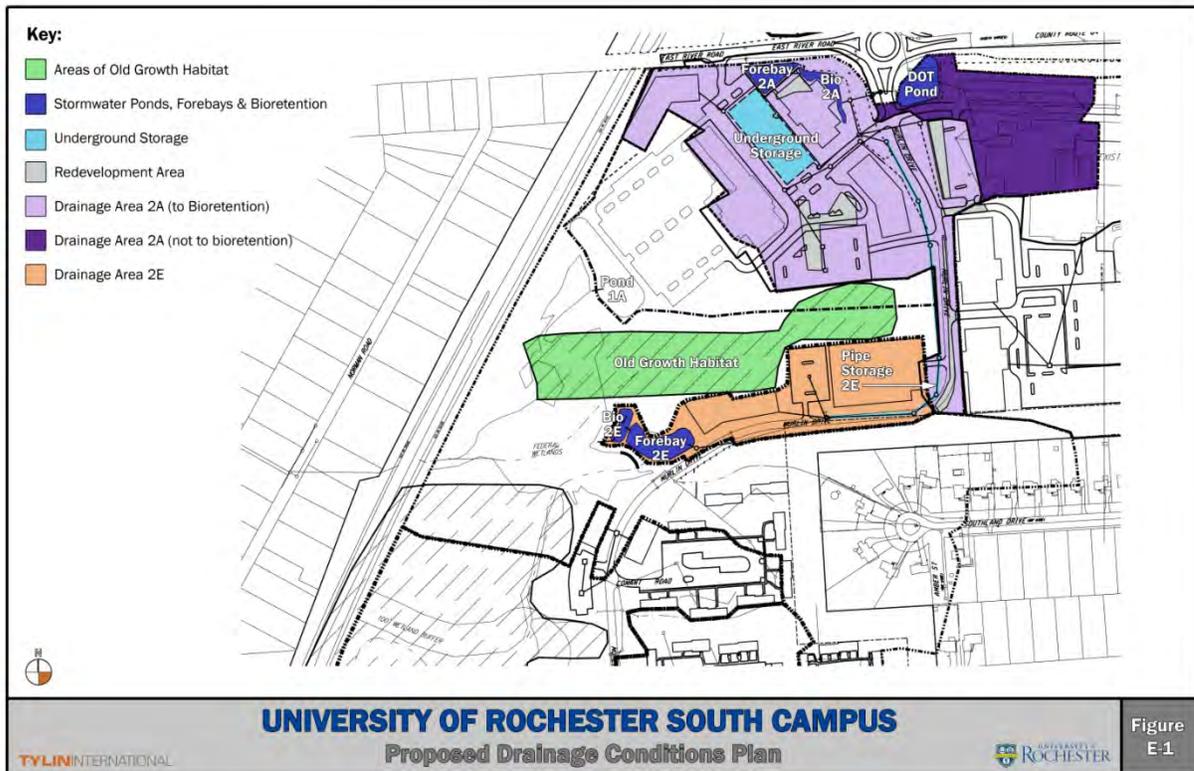
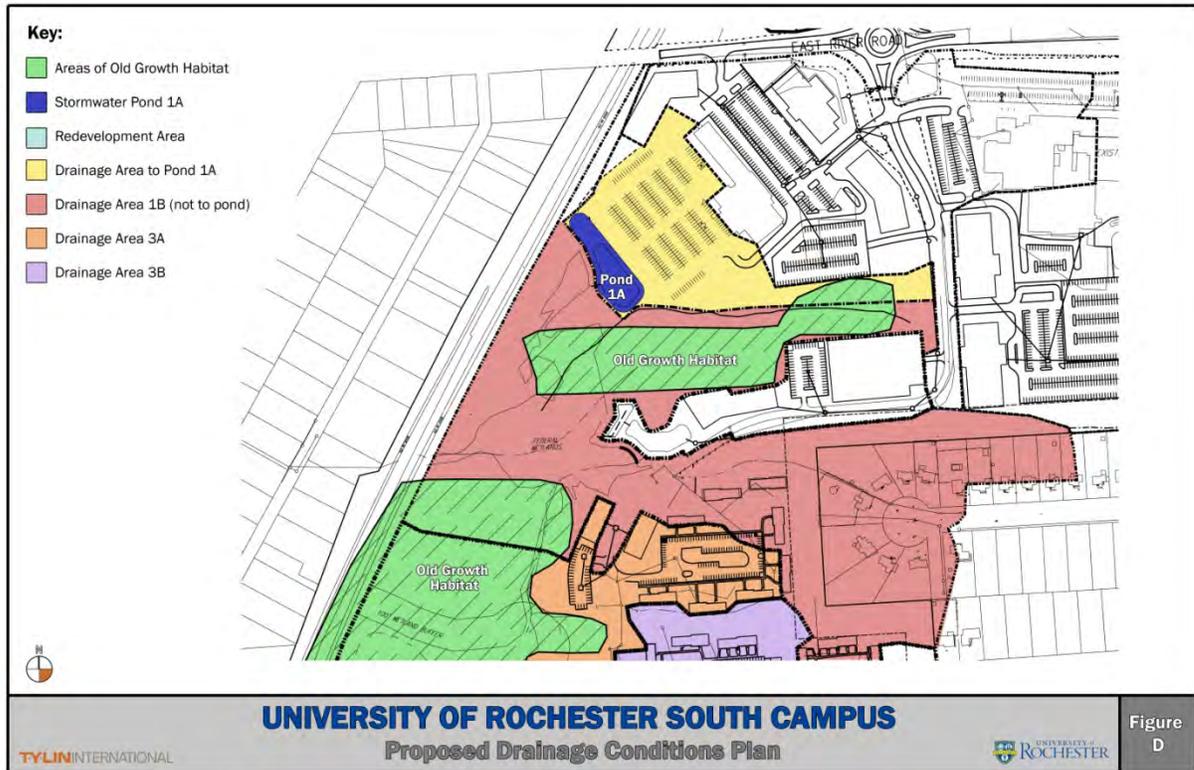
Site Run-off

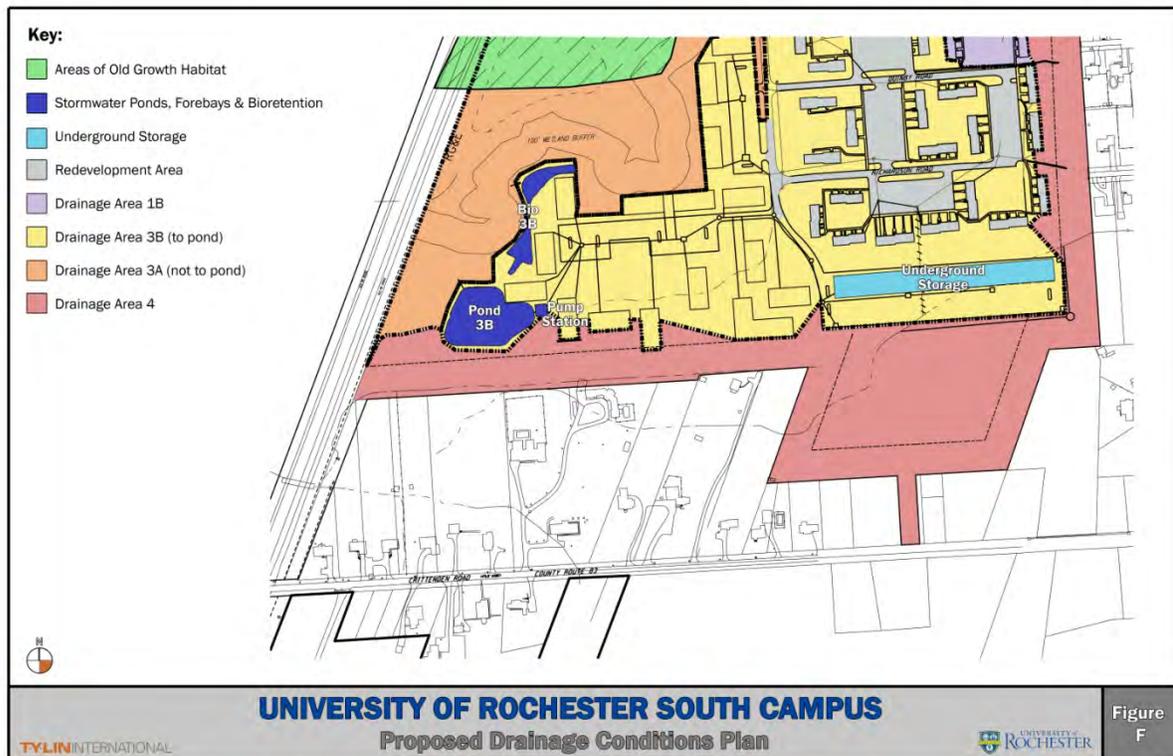
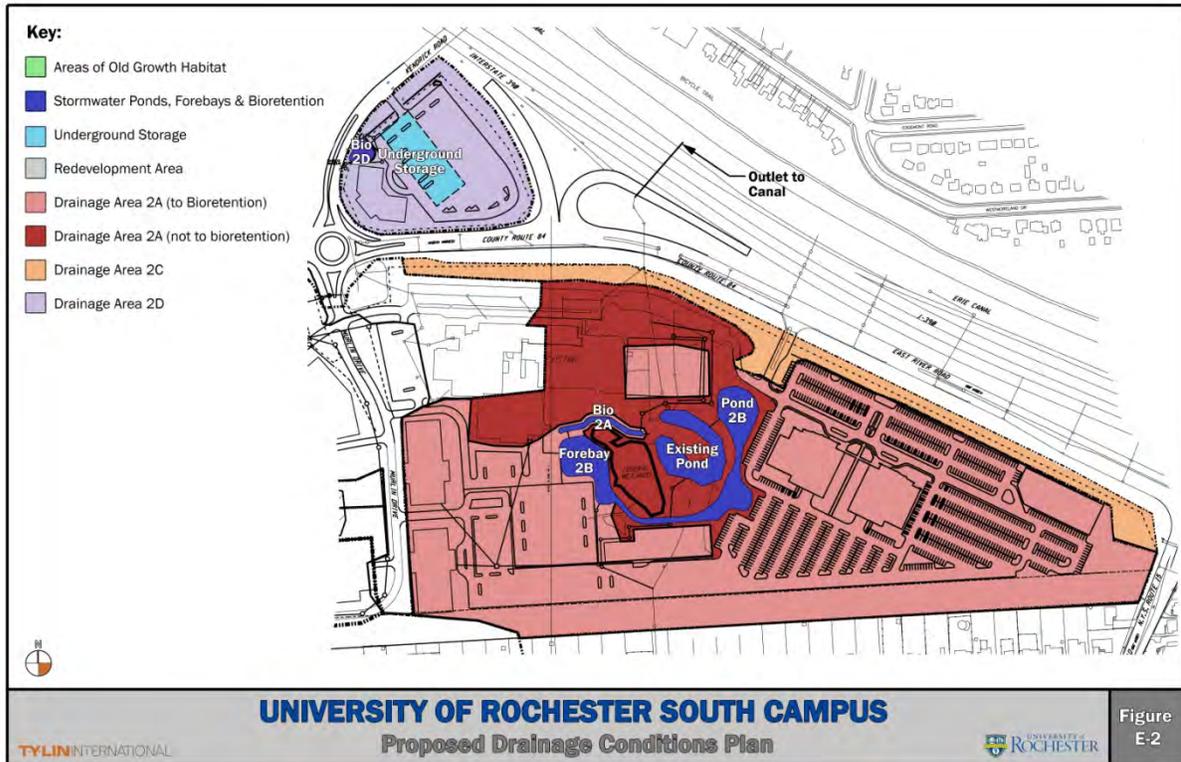
<i>Drainage Area</i>	<i>Design Storm</i>	<i>Existing Run off (cfs)</i>	<i>Proposed Run off (cfs)</i>
Subarea 1 <i>Northern Red Creek Tributary</i>	<i>1-yr</i>	21.4	11.8
	<i>2-yr</i>	27.9	15.7
	<i>10-yr</i>	53.8	32.6
	<i>25-yr</i>	66.4	41.0
	<i>100-yr</i>	87.1	54.7
Subarea 2A <i>Erie Canal via NYSDOT Detention Pond</i>	<i>1-yr</i>	15.5	14.7
	<i>2-yr</i>	19.4	17.7
	<i>10-yr</i>	34.6	29.7
	<i>25-yr</i>	41.7	35.1
	<i>100-yr</i>	53.2	43.3
Subarea 2B <i>Erie Canal via Existing Detention Pond</i>	<i>1-yr</i>	9.8	10.8
	<i>2-yr</i>	10.8	11.4
	<i>10-yr</i>	53.7	47.5
	<i>25-yr</i>	81.4	70.4
	<i>100-yr</i>	106.8	104.3
Subarea 2C <i>Erie Canal via I-390 Storm Sewer System</i>	<i>1-yr</i>	7.6	3.4
	<i>2-yr</i>	10.0	4.5
	<i>10-yr</i>	19.7	8.9
	<i>25-yr</i>	24.4	11.0
	<i>100-yr</i>	32.0	14.5
Subarea 2D <i>Erie Canal via Murlin Drive Sewer System</i>	<i>1-yr</i>	6.9	5.9
	<i>2-yr</i>	8.8	7.4
	<i>10-yr</i>	15.8	13.6
	<i>25-yr</i>	19.2	16.2
	<i>100-yr</i>	24.5	19.8
Subarea 3 <i>Southern Red Creek Tributary</i>		41.4	27.4
	<i>1-yr</i>	51.5	33.5
	<i>100-yr</i>	90.4	56.7
		108.5	67.3
		137.7	84.4
Subarea 4 <i>Furlong Creek drainage area</i>	<i>1-yr</i>	14.2	8.0
	<i>2-yr</i>	19.4	11.2
	<i>10-yr</i>	41.1	24.3
	<i>25-yr</i>	51.7	30.8
	<i>100-yr</i>	69.5	41.7
Subarea 5 <i>Lilac Park Subdivision; drains to Furlong Creek</i>	<i>1-yr</i>	9.8	9.8
	<i>2-yr</i>	30.3	30.3
	<i>10-yr</i>	36.9	36.9
	<i>25-yr</i>	48.5	48.5
	<i>100-yr</i>	68.1	68.1
Total On Site & Off Site	<i>1-yr</i>	127	92
	<i>2-yr</i>	178	132
	<i>10-yr</i>	346	250
	<i>25-yr</i>	442	320
	<i>100-yr</i>	579	431

Comparison of Pre- & Post-Development Runoff Rates

Overall the proposed stormwater management facilities will result in a decrease to the post-development runoff rate. Subareas #1 will reduce the 100-yr post-developed rate to the 25-yr pre-developed rate and the 25-yr post-developed rate to the 10-yr pre-developed rate. The 10-yr post-developed rate is not completely reduced to the 2-yr pre-developed rate but the post-developed 10-yr storm event is completely discharged through a 3-inch orifice. Rate attenuation is accomplished through stormwater management facilities which include ponds and underground storage chambers which discharge through outlet structures. Channel protection volume for the 1-year storm is applicable to developed area which discharge to natural watercourses and will be met by completely discharging this event through a 3-inch orifice. Subarea #2 discharges to a 5-th order waterbody thus attenuation is typically not required. Because this system discharges through the NYSDOT storm sewer system, post-development rates must be equal to existing conditions. For the larger storms this is achieved through ponds and underground storage. The NYSDOT storm sewer system is typically sized for a 10-year storm capacity. Storm events less than the 10-year have been attenuated to the pre-developed 10-year runoff rate. Subarea #3 is similar to Subarea #1 in that the higher storms attenuate rates to the subsequent lower storm and the 10-year storm is completely discharged through a 3-inch orifice. An interconnected above ground and below ground storage system is provided. The above ground portion allows this SMP to be regulated by a constant state pump and an outlet control structure. The outlet control will attenuate rates necessary to provide channel protection volume. Subarea #4 will reduce the post-developed runoff rate for each of the storm events by reducing the drainage area size. Development is not proposed within Subarea #4 or #5. Subarea #5 will not be affected by the proposed developments.

Stormwater management facilities designed to attenuate post-developed runoff rates have been located in subareas #1 through #3. The practices have been sized to comply with New York State Stormwater Management Design Manual's (NYS SMDM) pond requirements listed in Chapter 6.1, Refer to the following figures for locations of the proposed detention systems designs.





Stormwater Facility

Stormwater Facility	Volume of Detention Provided (acre-ft)
Pond # 1A	2.25
Underground Storage # 2A*	3.5
Pond #2B *	3.72
Underground Storage #2D*	0.5
Underground Storage #2E*	0.35
Underground Storage & Pond #3B*	8.4

* This drainage area discharges to a bioretention infiltration system prior to reaching the detention pond.

Drainage areas that discharge to a bioretention infiltration system prior to reaching the detention pond were conservatively assumed to obtain no runoff losses from infiltration and the entire drainage area runoff volume was routed to the detention system.

Description of Rate Attenuation Stormwater Management Facilities

The New York State Stormwater Management Design Manual's (NYS SMDM) specifies that ponds should be designed to detain the 1-yr post-developed run-off volume, and be outlet over a 24-hour period to provide channel protection to the downstream receiving waters. The 10-yr developed peak run-off rate should be attenuated to that of existing conditions to prevent an increase in out-of-bank flooding generated by an increase in development. The 100-yr developed peak run-off rate should be attenuated to existing run-off rates to provide for extreme flood protection. The intent of the extreme flood criteria is to prevent the increased risk of flood damage from large storm events, maintain the boundaries of the predevelopment 100-yr floodplain, and protect the physical integrity of storm water management practices. The Town of Brighton further requires the 25-yr developed run-off rate be analyzed and the 100-yr post development runoff rate be reduced to the 25-yr pre-development runoff rate and so forth for each smaller storm. Reduction of the peak post-development flows at the storm water ponds should be achieved through the use of outlet structures that will allow varying discharge rates.

Stormwater management facilities designed to attenuate post-developed runoff rates have been located in subareas #1 through #3. The practices have been sized to comply with NYS SMDM pond requirements.

- Stormwater Pond #1 is located within Subarea #1 and the outlet structure will discharge to the wetlands in Subarea #1, which flow to Red Creek.
- Stormwater Pond #2B, Underground Detention System #2 A, #2E and #2D are located within Subarea #2. These systems outlet through different points to the storm sewer system connected to the I-390 system that eventually outlets into the Erie Canal.
- Stormwater Pond #3B is a combination of a surface pond and an underground detention system. The underground detention system is linked to the surface pond via a stormwater pump. The surface pond will contain an outlet structure that will attenuate flows to meet Channel Protection requirements and pre-existing runoff rates. The pump will be equipped with floats. As storage volume becomes available in the surface pond, the pump will be triggered on and will pump water from the underground system to the surface pond. Subarea #3 will discharge to the south wetlands. Amenity implementation (as discussed in section 4) in the south wetland will cause this area to not outlet for storm events equal to or less than the 100-yr frequency occurrence. The provided underground storage along with the existing storage volume in subarea #3 is adequate to provide the required detention volume (after swale mitigation) to contain the post-developed 100-year storm event without discharging to the Furlong Creek drainage area to the south.

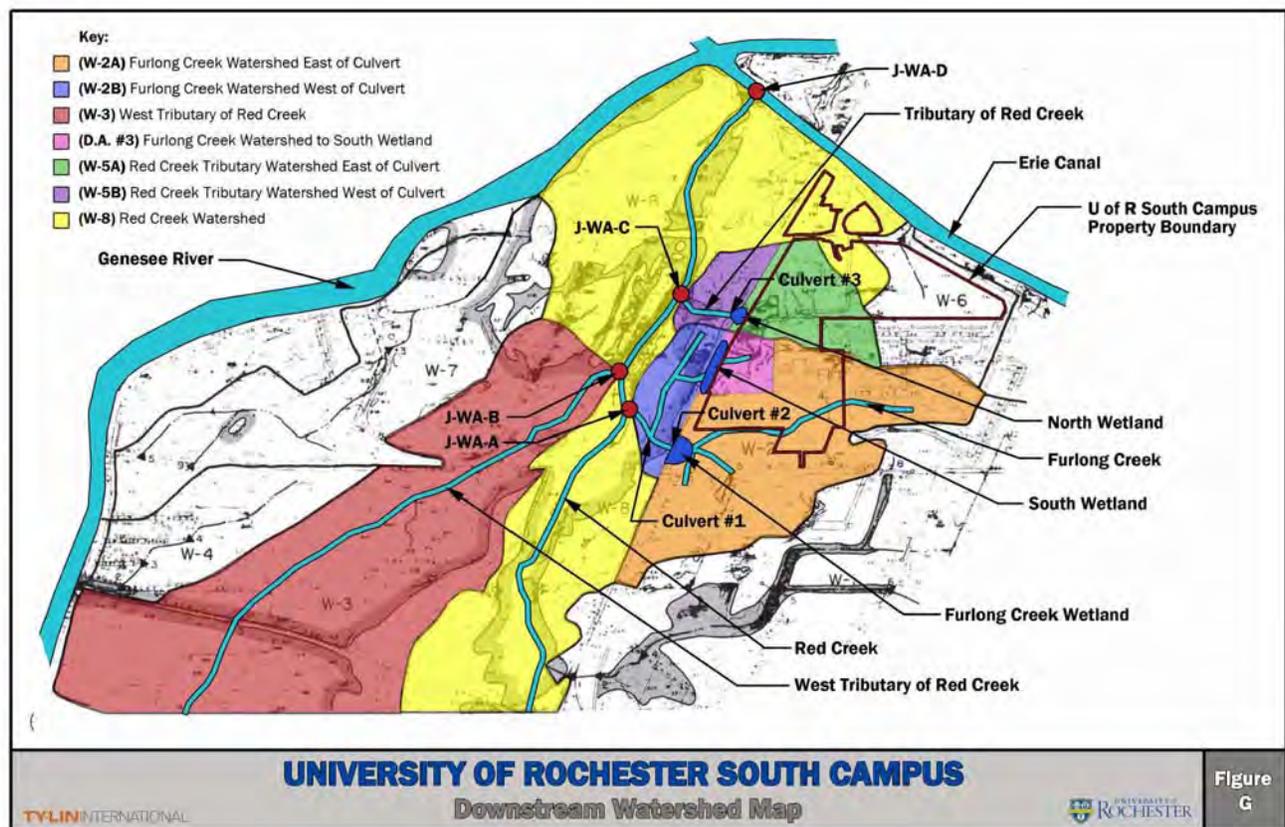
The design complies with NYSDEC and the Town of Brighton development standards for attenuation of post-development runoff rates.

- 2. Post-Development Project Impacts Downstream** – Will result in negligible changes to downstream existing conditions for the Erie Canal drainage area and will result in a positive impact to downstream flooding conditions for the Red Creek drainage areas.

The proposed development will have only positive impacts on the natural downstream watercourses and their respective drainage areas. This is accomplished by reducing the drainage area from the re-zone property to these discharge points and providing additional detention volume prior to discharge. The drainage area to the south wetlands (D.A. #3) will increase; however, storage volume has been provided for the additional runoff volume this area will receive. The ponding in the wetland area will not be higher than the lowest point in the ridge (after amenity improvements) between this area and the Furlong Creek drainage area so all runoff will be completely contained in this area. The drainage area to the Erie Canal is also proposed to be increased. The Erie Canal is a man-made 5th order water body designed to be at the bottom of the watershed.

Refer to Figure in Appendix A of the Drainage Report for Erie Canal 5th order calculation. The canal is capable of handling the additional volume without any negative downstream impacts. The drainage from the rezone property reaches the Erie Canal by four (4) different routes: the existing DOT detention pond, the existing U of R detention pond, the Kendrick Drive storm sewer system and sheet drainage to the I-390 storm sewer system. Detention has been provided upstream of each of these points to attenuate post-development runoff rates to pre-development conditions.

A downstream analysis was done to look at the effects of the proposed detention system and hydrologic changes in respect to the overall watershed drainage of Red Creek. Red Creek is located west of the site and flows north to the Erie Canal. Furlong Creek confluences with Red Creek, just upstream of the project area. This confluence point is delineated as Analysis Point ‘A’ in this report. The second major confluence is downstream where the West Tributary of Red Creek joins Red Creek. This confluence point is delineated as Analysis Point ‘B’ in this report. The next confluence point downstream is the Red Creek Tributary which joins on the east side of the creek. This confluence point is delineated as Analysis Point ‘C’ in this report. Analysis Point ‘D’ is the location where Red Creek meets the Erie Canal. Refer to the Figure below for a map of the downstream watershed.



The U of R rezone property is approximately 180 acres so in following the 10% rule outlined in the New York Stormwater Management Design Manual an area of 1,800 acres was analyzed. Due to the project's location at the bottom end of the Red Creek watershed, the study area extended from the Erie Canal upstream to a watershed area of 1,800 acres. This is approximately the point just downstream of the confluence of Red Creek with the West Tributary of Red Creek. The downstream study area therefore included Furlong Creek. As an additional measure, a general look at the watershed hydrograph for Red Creek upstream of the confluence with Furlong Creek was looked at.

Red Creek and the West Tributary of Red Creek have been studied and are detailed in the Monroe County Flood Insurance Study (FIS), last updated August 2008. The entire Red Creek watershed is approximately 22 square miles and the West Tributary of Red Creek watershed is approximately 3 square miles. The Town of Brighton Townwide Study assigned a naming convention for the downstream watersheds and culvert. A similar, but slightly modified naming convention was used in this report for a more detailed analysis. Refer to the table below for the naming convention.

Drainage Area, Culvert & Analysis Point Designations

Designation	Description	Source
W-8	Red Creek Watershed	Townwide Study
W-8 @ A	Red Creek Watershed North of confluence with Furlong Creek	TYLI Drainage Report
W-8 @ D	Red Creek watershed between confluence with Furlong Creek and confluence with Erie Canal	TYLI Drainage Report
W-3	West Tributary of Red Creek watershed	Townwide Study
W-2	Furlong Creek Watershed (includes drainage areas #3, #4 & #5)	Townwide Study
W-2A	Furlong Creek watershed east of Lehigh Valley (L.V.) Trail	TYLI Drainage Report
W-2B	Furlong Creek watershed west of L.V. Trail	TYLI Drainage Report
W-5	Red Creek North Tributary watershed	Townwide Study
W-5A	Red Creek North Tributary watershed east of L.V. Trail (is equivalent to drainage area #1)	TYLI Drainage Report
W-5B	Red Creek North Tributary watershed west of L.V. Trail	TYLI Drainage Report
#1	Analysis Point on Furlong Creek just above confluence with Red Creek	Townwide Study
#2	Culvert for Furlong Creek under L.V. trail berm	Townwide Study
#3	Culvert for North Red Creek Tributary under L.V. trail berm	Townwide Study
#7 & #8	Culverts for South Wetland under L.V. trail berm	Townwide Study

The drainage area for Furlong Creek was developed based on available topographic information and the area delineated in the Townwide Drainage Study. Based on this information, a drainage area of 0.42

square miles (271 Ac) for Furlong Creek was developed. The longest flow path was developed to determine a hydrograph for the peak runoff rate from this watershed. This information was used to review the timing of the proposed detention discharges with the Furlong Creek peak hydrograph timing. Refer to Appendix A for a map of the Furlong Creek drainage area.

A combination of record data from the Townwide Study, Streamstats and the Monroe County Flood Insurance Study (FIS), along with ground cover delineations and Pondpac was used to develop approximate hydrographs of the surrounding watersheds. Refer to the table on the following page for the existing and proposed runoff rate information.

Existing & Proposed Downstream Runoff Rates

Drainage Area	Storm Event	Exist. Runoff Rate (cfs)	Prop. Runoff Rate (cfs)
W-5B Northern Red Creek Tributary	1-Yr	24.7	24.7
	2-Yr	32.6	32.6
	10-Yr	64.8	64.8
	25-Yr	80.4	80.4
	50-Yr	96.4	96.4
	100-Yr	106.1	106.1
W-2A (includes D.A. #4 & D.A. #5) Furlong Creek	1-Yr	33.5	30.2
	2-Yr	46.3	41.8
	10-Yr	102.5	92.9
	25-Yr	130.8	118.6
	50-Yr	160.1	145.3
	100-Yr	178.2	161.7
W-2B Furlong Creek	1-Yr	17.5	17.5
	2-Yr	25.6	25.6
	10-Yr	60.7	60.7
	25-Yr	78.6	78.6
	50-Yr	97.2	97.2
	100-Yr	108.6	108.6
W-8 @ A Red Creek	1-Yr	277.6	277.6
	2-Yr	411.1	411.1
	10-Yr	1057.6**	1057.6**
	25-Yr	1409.8	1409.8
	50-Yr	1788.8**	1788.8**
	100-Yr	2027.0**	2027.0**
W-3 Red Creek	1-Yr	50.9	50.9
	2-Yr	83.1	83.1
	10-Yr	252.9**	252.9**
	25-Yr	349.9	349.9
	50-Yr	456.0**	456.0**
	100-Yr	523.3**	523.3**
W-8 @ D Red Creek	1-Yr	0	0
	2-Yr	0	0
	10-Yr	1.4	1.4
	25-Yr	3.5	3.5
	50-Yr	7.5	7.5
	100-Yr	10.9	10.9
O-W8@D Red Creek	1-Yr	316.4	313.6
	2-Yr	468.2	464.3
	10-Yr	1190.5**	1180.0**
	25-Yr	1598.5	1574.1
	50-Yr	2038.6**	2012.5**
	100-Yr	2315.7**	2286.9**

** Flow Rates closely match FIS study flow rates.

To determine the effects of the proposed developed on downstream runoff rates and flooding volumes the railroad culverts and wetland storage areas were added to the models for subareas #1 & #3. Subarea #2 is not affected by a culvert restriction. The wetland and culvert restriction for Furlong Creek was also added to the model. Refer to the Drainage Report

for the complete results of the calculations and analysis. Refer to the table below for a summary of the results.

Site Run-off w/ Culvert Restrictions & Wetland Storage

Drainage Area	Design Storm	Existing Run off (cfs)	Proposed Run off (cfs)
Subarea 1 (W-5) Northern Red Creek Tributary <i>Ex: (J-3)</i> <i>Pr: (J-3)</i>	1-yr	27.8	6.2
	2-yr	36.7	7.5
	10-yr	72.2	13.6
	25-yr	89.4	16.4
	100-yr	117.4	19.5
Subarea 3 South Wetlands <i>Ex: (S. Wetland OUT)</i> <i>Pr: (J-7)</i>	1-yr	8.1	0
	2-yr	11.1	
	10-yr	24.4	
	25-yr	30.7	
	100-yr	41.0	
Subarea W-2 (inc. DA #4 & 5) Furlong Creek <i>Ex: (J-1)</i> <i>Pr: (J-1)</i>	1-yr	33.0	24.7
	2-yr	40.4	33.5
	10-yr	73.7	70.7
	25-yr	95.4	91.0
	100-yr	133.0	125.9
Analysis Pt A Red Creek <i>Ex/Pr: (J-W8-A)</i>	1-yr	283.8	281.8
	2-yr	420.7	417.2
	10-yr	1077.1	1069.2
	25-yr	1438.9	1423.9
	100-yr	2078.3	2049.6
Analysis Pt B Red Creek <i>Ex/Pr: (J-W8-B)</i>	1-yr	314.5	311.9
	2-yr	465.8	462.2
	10-yr	1183.6	1175.4
	25-yr	1588.7	1566.8
	100-yr	2301.0	2276.0
Analysis Pt C Red Creek <i>Ex/Pr: (J-W8-C)</i>	1-yr	316.4	313.6
	2-yr	468.2	464.3
	10-yr	1189.2	1178.7
	25-yr	1596.1	1571.6
	100-yr	2311.1	2282.2
Analysis Pt D Red Creek <i>Ex/Pr: (O-W8-D)</i>	1-yr	316.4	313.6
	2-yr	468.2	464.3
	10-yr	1190.5	1180.0
	25-yr	1598.5	1574.1
	100-yr	2315.7	2286.9

The overall watershed discharge rates to the natural water bodies are decreased as a result of the project. This is accomplished by reducing the watershed area and creating a storage space in Drainage Area #3 that can completely contain the 100-year storm. Detention and attenuation in Drainage Area #1 further reduces the peak runoff rate. These rate reductions to the tributaries of Red Creek help to also have a slight decrease on the runoff rate of Red creek downstream of the project.

The following table shows the project's effects on the stormwater runoff rate and ponding elevations in the receiving wetlands: north wetland - (D.A. #1), south wetland - (D.A. #3) and Furlong Creek wetland - (D.A. #4).

Wetland Volume & Elevation

Event	Storm Event	Volume (Ac-ft)	Max Elev (ft)	Volume (Ac-ft)	Max Elev (ft)	Volume (Ac-ft)	Max Elev (ft)
		North Wetland (D.A. #1/W-5)		South Wetland (D.A. #3)		Furlong Creek Wetland (W-2)	
Existing	1-yr	0.8	526.5	1.2	525.7	6.3	521.0
	2-yr	1.0	526.7	1.6	525.8	7.2	521.3
	10-yr	2.3	527.3	2.6	525.9	12.4	522.6
	25-yr	3.0	527.6	3.2	526.0	15.4	523.2
	100-yr	4.1	527.9	4.3	526.2	21.4	523.8
Proposed	1-yr	0.4	526.1	2.7	526.3	5.7	520.8
	2-yr	0.5	526.2	3.3	526.4	6.3	521.0
	10-yr	1.3	526.8	5.5	526.7	9.7	522.0
	25-yr	1.7	527.0	7.4	526.9	11.8	522.5
	100-yr	2.1	527.2	10.6	527.2	15.4	523.2

The post-development drainage to the Red Creek tributary will have a 83% reduction in the pre-development runoff rate for the 100-yr storm event and a 38% reduction in the pre-development runoff volume. The post-development drainage to Furlong Creek will have a 5% reduction in the pre-development runoff rate for the 100-yr storm event and a 27% reduction in the pre-development runoff volume. The maximum ponding elevations for each of the storm events will decrease in the North wetland and the Furlong Creek wetland.

The ponding elevation in the South Wetland will increase as a result of the additional drainage area to this location. The ponding elevation will not overflow; to the Furlong Creek drainage area, the Lehigh Valley Trail, or the proposed outlet structure. The runoff rate to the South Wetland will be reduced significantly from existing conditions which will cause the ponding water to rise more slowly and allow the maximum extent possible to infiltrate to the soil.

The timing of the U of R discharges to the Red Creek Tributary (D.A. #1) and Furlong Creek (D.A. #3) watershed was also looked at to ensure the proposed detention did not cause the runoff rates peak to align with the receiving watersheds or Red Creek. In both instances, the project discharge peaks occurred before the receiving watershed peak and the

receiving watershed peak occurred before the Red Creek watershed peak for existing conditions. This same timing was maintained for proposed conditions.

The project will not result in negative impacts to downstream waters and may provide some positive impacts.

- 3. Pre- vs. Post-Development Peak Runoff Volume** – Will result in a decrease in site runoff volume to natural watercourses and will result in an increase in site runoff volume to the Erie Canal which is a 5th order man-made water body.

Any development which replaces pervious ground cover with impervious ground cover will result in a higher runoff volume from the developed area. The soils in the rezone area are not believe to be conducive to infiltration and many areas have a high ground water table which limits the extent volume infiltration practices can be employed. However, infiltration practices have been designed to take advantage of any infiltration capacity the soils may possess in reducing runoff volume. As discussed in Point #2, the post-developed stormwater management plan will redirect this additional volume, plus some existing runoff volume to locations with practices designed to promote infiltration. The practices promote infiltration by replacing the soil below the practice with engineered soil designed for infiltration. Underdrain is provided at the bottom of the infiltration soil layers as an additional drainage measure in the event that the natural soils below this layer do not infiltrate runoff. A conservative approach was taken in the volume runoff analysis. The practices were assumed to not infiltrate runoff and all runoff volume was assumed to reach the receiving water through overland or closed conduit flow.

The infiltration practices proposed in the post-developed stormwater management plan include: bioretention systems and proprietary filtration devices compliant with the NYSDEC requirements. Additional practices to achieve further volume infiltration such as: dry swales, disconnected rooftop runoff and vegetated swales may be incorporated into the final design plans if desired to further increase the runoff reduction volume provided; however, the current plan complies and exceeds the minimum NYSDEC requirements.

The existing and proposed runoff volume to the receiving waters are listed in the table on the following page.

Pre- & Post-Development Volume Comparison for Receiving Waters

Drainage Area	Storm Event	Exist Volume (Ac-ft)	Prop. Volume (Ac-ft)
North Tributary of Red Creek (J-3)	1-yr		
	2-yr	5.0	1.8
	10-yr	6.4	2.5
	25-yr	12.0	4.5
	100-yr	14.8	5.8
	100-yr	19.5	7.4
Erie Canal (O-2)	1-yr		
	2-yr	8.0	11.7
	10-yr	10.1	14.4
	25-yr	18.4	23.9
	100-yr	22.4	28.5
	100-yr	29.4	35.7
Furlong Creek (J-1)	1-yr		
	2-yr	13.8	9.8
	10-yr	18.1	13.0
	25-yr	35.9	26.7
	100-yr	44.8	33.6
	100-yr	59.8	45.4

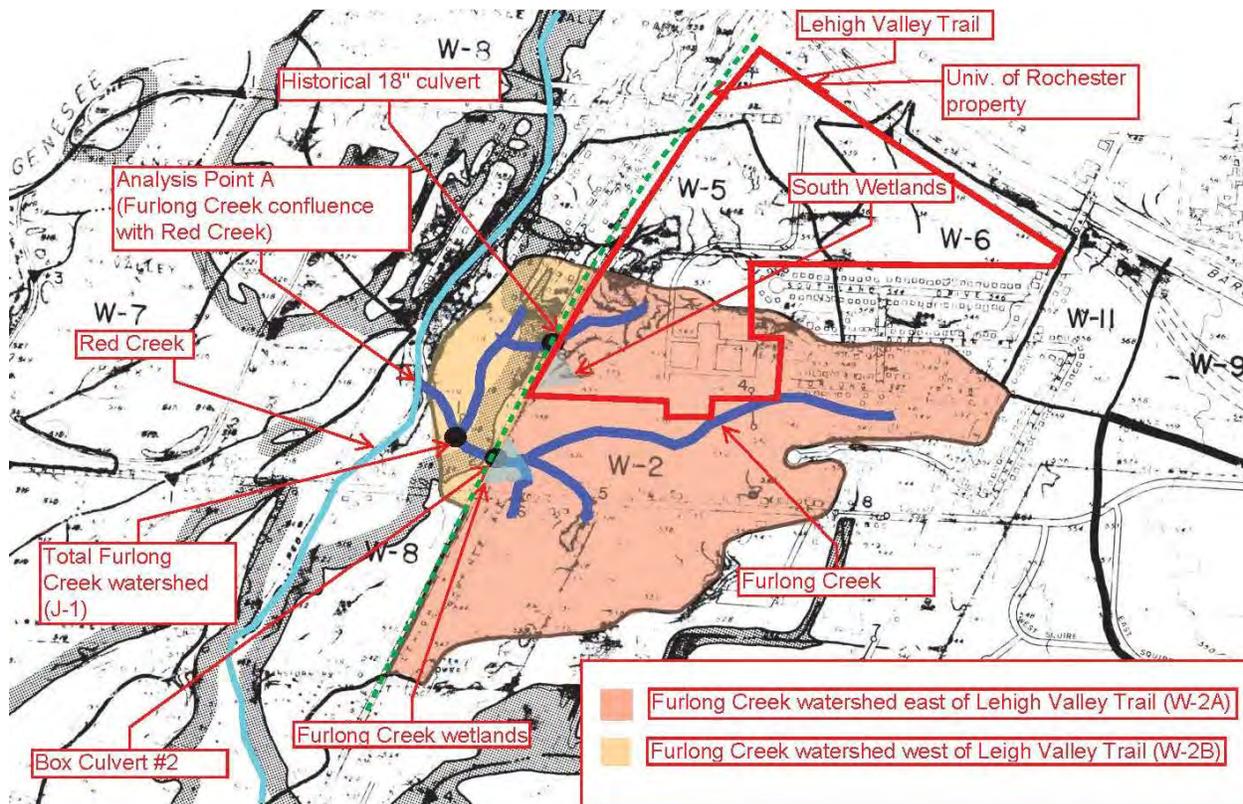
The project will not result in an increase in runoff to any natural receiving water body. Areas that will receive a volume increase are appropriately sized to handle the increased volume.

- 4. Post Development Project Impacts to Existing Flooding Problem Areas –** Existing flooding problems will not worsen over time due to the re-zone development proposed by the University.

Residential properties located along the north side of Crittenden Road adjacent to the Lehigh Valley Trail berm experience significant and disruptive flooding in their rear yards. The flooding is from drainage in the Furlong Creek watershed. This watershed is restricted by a box culvert under the trail berm. Upstream of the culvert, the Furlong Creek flow area is not well defined into a channel until further upstream. In the same area north of Crittenden Road, but west of the trail berm there is also some flooding problems by the residential properties on Norman and Helen Road. South of the residential area is a 100-year flood zone where ponding would be expected. A drainage ditch directs runoff south from the residential properties through the flood zone to Furlong Creek. Sheet drainage does not always reach the ditch and sometimes causes disruptive flooding to the residential properties.

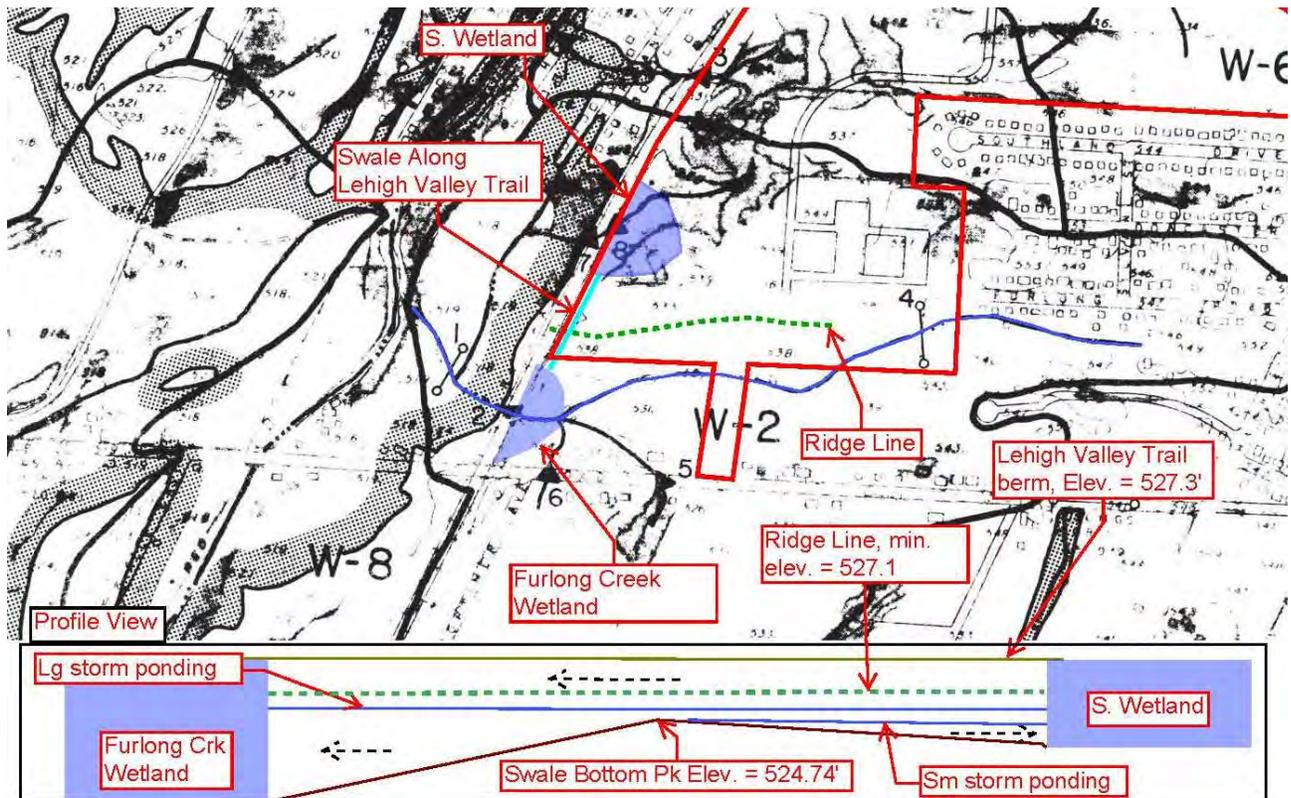
The Town of Brighton commissioned a Townwide Drainage Study in 1978 that included Furlong Creek. This study identified the Furlong Creek watershed to be 0.42 square miles. Of this area, approximately 0.35 square miles is located on the east side of the Lehigh Valley Trail (trail). The Town report refers to the Furlong Creek watershed with the delineation “W-2”. This report further subdivides the watershed into “W-2A” for the watershed on the east side of the trail and “W-2B” for the watershed on the west side of the trail. Furlong Creek is restricted at the Lehigh Valley trail location by a 2.5’ by 3’ stone culvert that passes under the trail (referred to as culvert #2 in the Town report). Upstream of the culvert, the Furlong Creek flow area is not well defined into a channel until further upstream. There is a swale that runs parallel to the residential rear property line’s that collects this drainage and routes it to the culvert. A large wetland area exists on the U of R property referred to in this report as the “south wetland” in Drainage Area #3 (D.A. #3). It is believed an 18” culvert once drained this wetland and conveyed drainage under the trail to the west and then south through a drainage ditch to Furlong Creek. This drainage pattern is shown in the map included in the Town Drainage Study. Refer to the figure below for a copy of the Townwide Drainage Study Map. Color and call-outs have been added for clarity.

Furlong Creek Drainage Area



Despite the historical information, a culvert outlet for the south wetlands could not be found by multiple parties. The south wetlands contain a large volume of standing water and storage potential. The standing water exhibits stagnant behavior. Discharge from this wetland area occurs two ways. The first is through slow ground infiltration and evapotranspiration. This would occur over a long period of time for smaller, intermitted storm events. The second discharge point occurs through a swale that runs along the Lehigh Valley embankment. This swale connects the south wetland to the Furlong Creek drainage area to the south. A well defined ridge separates these two drainage areas except for this swale. The swale has a peak in the bottom elevation of it at the ridge line thus directing runoff away in opposing directions from the peak. Large storm events in the south watershed (D.A. #3) that exceed the capacity of the storage area will surmount the high point in the swale and flow south into the Furlong Creek watershed, specifically the Furlong Creek wetland area east of the Lehigh Valley Trail. Refer to the figure below for a diagram of this drainage pattern.

South Wetland Overflow Swale to Furlong Creek



The drainage patterns were modeled in Pondpac with the outflow from the South Wetland directed over the swale high point (via a weir) to the Furlong Creek Watershed.

The following tables are the Pondpac hydrologic analysis results for the runoff rates to the South Wetland, Furlong Creek Wetland and Furlong Creek watershed for existing and proposed conditions. Also listed are the existing ponding elevations.

Existing Ponding Elevations & Volumes

<i>Storm Event</i>	<i>S. Wetland Elev. (ft)</i>	<i>S. Wetland Vol. (Ac-ft)</i>	<i>Furlong Creek Wetland Elev. (ft)</i>	<i>Furlong Creek Wetland Vol. (Ac-ft)</i>
1-Yr	525.69*	1.2	521.03	6.3
2-Yr	525.77*	1.6	521.29	7.2
10-Yr	525.94*	2.6	522.60	12.4
25-Yr	526.03*	3.2	523.19	15.4
50-Yr	526.11*	3.9	523.62	19.1
100-Yr	526.16*	4.3	523.80	21.4

*Ponding elevation overtops high point in swale (524.74'), so a portion of the drainage would flow south to Furlong Creek wetlands watershed in the swale; does not surmount ridge line/ground surface above swale (527.1') or Lehigh Valley Trail berm (527.3').

Existing Runoff Rates

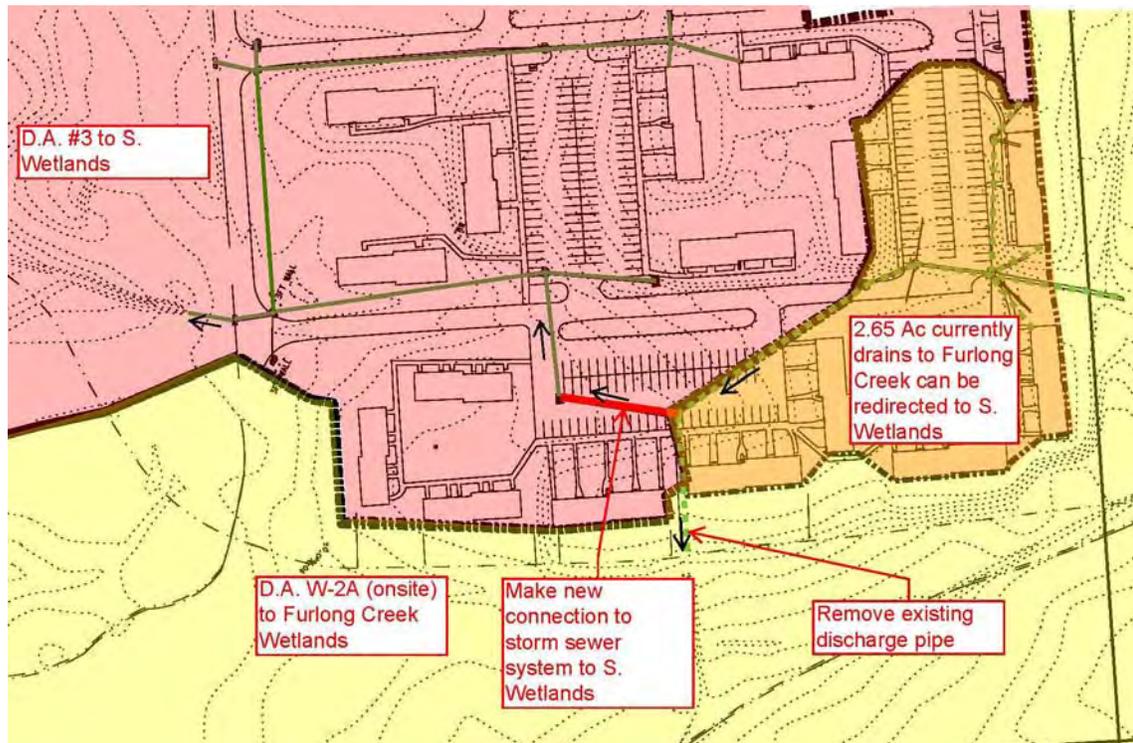
<i>Storm Event</i>	<i>D.A. #3 to S. Wetland (cfs)</i>	<i>S. Wetland to Furlong Creek Wetland (cfs)</i>	<i>W-2A to Furlong Creek Wetland (cfs)</i>	<i>Furlong Creek Wetland culvert discharge (Culv. #2) (cfs)</i>	<i>Total Furlong Creek watershed (cfs)</i>
1-Yr	41.4	8.1	33.5	30.9	33.0
2-Yr	51.5	11.1	46.3	37.9	40.4
10-Yr	90.4	24.4	102.5	62.6	73.7
25-Yr	108.5	30.7	130.8	70.8	95.4
50-Yr	126.8	37.1	160.1	76.3	118.5
100-Yr	137.7	41.0	178.2	78.5	133.0

Pre-Development Potential Flooding Improvement Amenities

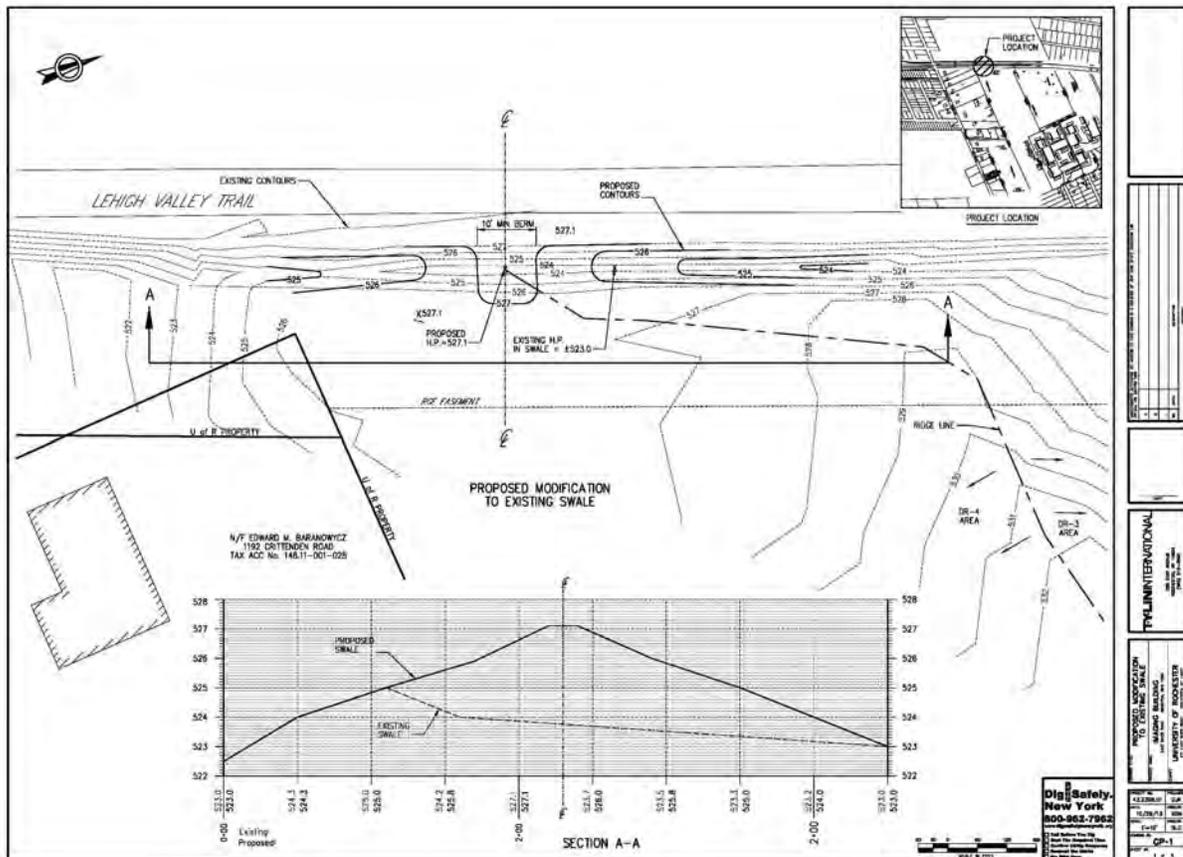
Three actions were identified that have the potential to improve the flooding experienced by the property owners east of Lehigh Valley trail along Crittenden Road.

- The first amenity is to redirect runoff from the developed portion of the University of Rochester property that currently drains to the Furlong Creek watershed. A connection can be made in the storm sewer system that will re-route this runoff to the south wetland. This will remove 2.65 acres from the Furlong Creek watershed east of the Lehigh Valley trail where ponding is experienced. Refer to the figure below for the first amenity location.

New Storm Sewer Connection

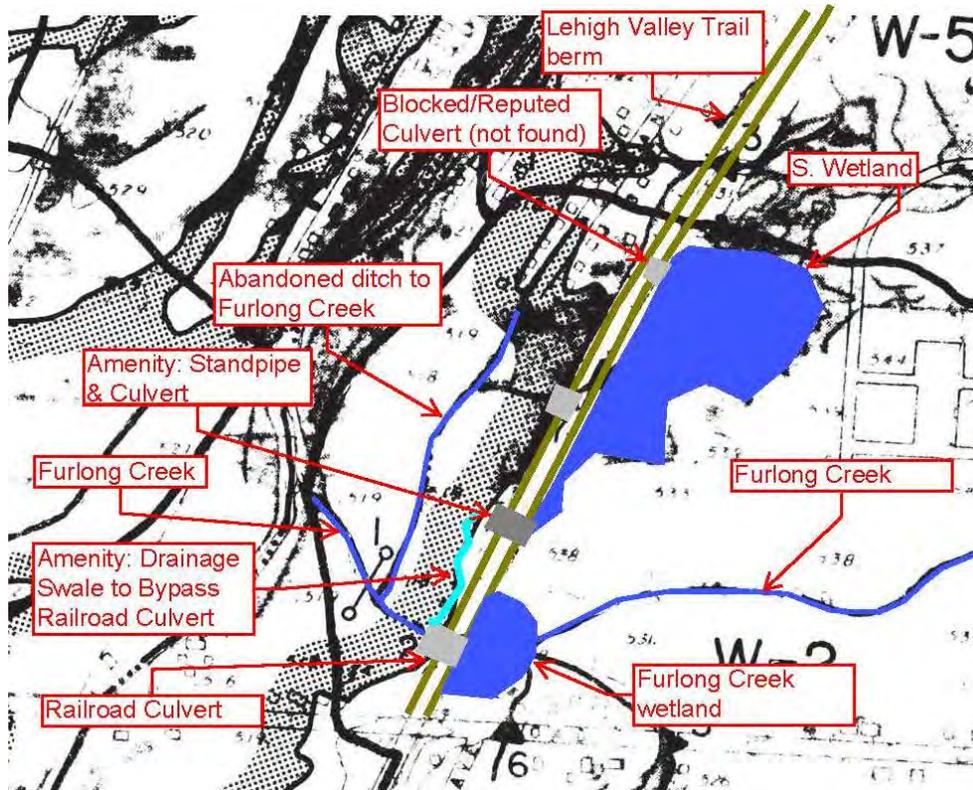


- The second amenity is to close the swale that connects the South Wetland to the Furlong Creek watershed by creating a berm in it. This will raise the elevation for ponding in the South Wetlands by 2.4 ft prior to it overflowing the ridge into the Furlong Creek watershed. Refer to the berm modification figure on the following page.



- The third amenity is to construct an outlet structure in the South Wetland to control the ponding elevation thus reducing the potential for it to overtop the ridge and enter the Furlong Creek watershed. The outlet structure will consist of a stand pipe with a top elevation at the proposed conditions 100-year ponding elevation. The stand pipe will discharge through a culvert under the Lehigh Valley Trail. It will be equipped with perforations to allow a minimal amount of discharge which will cause the wetland to slowly return to a base water surface elevation between storm events. A defined drainage channel can be constructed on the west side of the trail berm to direct runoff towards Furlong Creek where the sheet flow currently reaches the residential properties. This amenity will help to redirect some of the flooding volume around the existing railroad culvert. Refer to the figure on the following page for a diagram of the South Wetland discharge.

South Wetland Discharge



These amenities have the potential to help reduce flooding by redirecting some of the flooding volume away from the problem areas. However, Furlong Creek has a large upstream drainage area consisting of dense natural vegetation and relatively flat topography; only a small portion of this Furlong Creek drainage area resides on the U of R south campus. Though the proposed amenities on the U of R property will provide some improvement from existing conditions, the majority of the flow to Furlong Creek comes from off-site areas to the east and south of Crittenden Road that are not in the rezone area. Implementation of amenity measures will result in only undeveloped areas on the U of R property contributing runoff to this drainage area. The results of the amenities on the Furlong Creek drainage area are shown in the tables on the following page.

Existing Ponding Elevations & Volumes after Amenities Inclusion

Storm Event	S. Wetland Elev. (ft)*	S. Wetland Vol. (Ac-ft)	Furlong Creek Wetland Elev. (ft)	Furlong Creek Wetland Vol. (Ac-ft)
1-Yr	526.0	3.3	520.8 (-0.2')	5.7 (-0.6)
2-Yr	526.2	4.2	521.0 (-0.3')	6.3 (-0.9)
10-Yr	526.6	7.6	522.0 (-0.6')	9.9 (-2.5)
25-Yr	526.7	9.2	522.5 (-0.7')	12.1 (-3.3)
50-Yr	526.9	10.6	523.1 (-0.5')	14.6 (-4.5)
100-Yr	527.0	11.5	523.3 (-0.5')	16.0 (-5.4)

*Wetland discharge at standpipe elevation (527.0).

Existing Runoff Rates After Amenities Inclusion

Storm Event	D.A. #3 to S. Wetland (cfs)	S. Wetland to Furlong Creek Wetland (cfs)	W-2A to Furlong Creek Wetland (cfs)	Furlong Creek Wetland culvert discharge (Culv. #2) (cfs)	Total Furlong Creek watershed (cfs)
1-Yr	44.3 (+2.9)	0 (-8.1)	30.1 (-3.4)	22.3 (-8.6)	24.4 (-8.6)
2-Yr	55.1 (+3.6)	0 (-11.1)	42.0 (-4.3)	30.7 (-7.2)	33.4 (-7.0)
10-Yr	96.7 (+6.3)	0 (-24.4)	95.8 (-6.7)	52.9 (-9.7)	70.3 (-3.4)
25-Yr	116.1 (+7.6)	0 (-30.7)	123.1 (-7.7)	61.5 (-9.3)	90.7 (-4.7)
50-Yr	135.7 (+8.9)	0 (-37.1)	151.6 (-8.5)	69.2 (-7.1)	112.3 (-6.2)
100-Yr	147.4 (+9.7)	0 (-41.0)	169.1 (-9.1)	72.0 (-6.5)	125.8 (-7.2)

There will be a reduction both in runoff rate and volume to the Furlong Creek wetland area on the east side of the culvert and from the Furlong Creek culvert to the drainage area on the west side of the trail berm. Drainage Area #3 will receive significantly more runoff volume at a slightly higher rate. The amenities allow this area to contain the volume and release it slowly over time so the contribution during the storm and ponding event will be negligible.

Further mitigation would be provided with the post-development stormwater management conditions by again reducing the drainage area to Furlong Creek east of the culvert. This would result in a 5% reduction in

the pre-development runoff rate for the 100-yr storm event and a 25% reduction in the pre-development runoff volume from existing conditions. The proposed mitigation measures will help to reduce some of the flow, but the flooding in low-lying areas will persist during wet periods due to the fact that the runoff from the U of R is only a small contributor to this volume in relation to the offsite drainage area. Additional storage will be provided in Drainage Area #3 to reduce flow rates into the South Wetlands back to existing conditions.

The results of the post-development conditions on the South Wetland and Furlong Creek drainage areas are shown in the tables below.

Table 9.5 - Proposed Ponding Elevations & Volumes

Storm Event	S. Wetland Elev. (ft)	S. Wetland Vol. (Ac-ft)	Furlong Creek Wetland Elev. (ft)	Furlong Creek Wetland Vol. (Ac-ft)
1-Yr	526.3 (+0.6)	2.7 (+1.5)	520.8 (-0.2)	5.7 (-0.6)
2-Yr	526.4 (+0.6)	3.3 (+1.7)	521.0 (-0.3)	6.3 (-0.9)
10-Yr	526.7 (+0.8)	5.5 (+2.9)	522.0 (-0.6)	9.7 (-2.7)
25-Yr	526.9 (+0.9)	7.4 (+4.2)	522.5 (-0.7)	11.8 (-3.5)
50-Yr	527.1 (+1.0)	9.3 (+5.4)	523.0 (-0.6)	14.1 (-4.9)
100-Yr	527.2 (+1.1)	10.6 (+6.3)	523.2 (-0.6)	15.4 (-5.6)

**Does not surmount ridge line (527.1') or Lehigh Valley Trail berm (527.3').*

Proposed Runoff Rates

<i>Storm Event</i>	<i>D.A. #3 to S. Wetland (cfs) (#3A + #3B)</i>	<i>S. Wetland to Furlong Creek Wetland (cfs)</i>	<i>W-2A to Furlong Creek Wetland (cfs)</i>	<i>Furlong Creek Wetland culvert discharge (Culv. #2) (cfs)</i>	<i>Total Furlong Creek watershed (cfs)</i>
1-Yr	27.4 (-14.0)	0 (-8.1)	30.6 (-2.9)	22.6 (-8.3)	24.7 (-8.3)
2-Yr	33.5 (-18.0)	0 (-11.1)	42.3 (-4.0)	30.8 (-7.1)	33.5 (-6.9)
10-Yr	56.7 (-33.7)	0 (-24.4)	93.6 (-8.9)	52.0 (-10.6)	70.7 (-3.0)
25-Yr	67.3 (-41.2)	0 (-30.7)	119.4 (-11.4)	60.3 (-10.5)	91.0 (-4.4)
50-Yr	78.0 (-48.8)	0 (-37.1)	146.2 (-13.9)	67.7 (-8.6)	112.5 (-6.0)
100-Yr	84.4 (-53.3)	0 (-41.0)	162.6 (-15.6)	70.9 (-7.6)	125.9 (-7.1)

There will be a reduction both in runoff rate and volume to the Furlong Creek wetland area on the east side of the culvert and from the Furlong Creek culvert to the drainage area on the west side of the trail berm. Drainage Area #3 will receive significantly more runoff volume. Detention volume is provided to account for this increase. An outlet structure from the detention facility will attenuate runoff rates to the south wetlands to at or below pre-developed conditions. The proposed design allows this area to contain the volume and release it slowly over time so the contribution during the storm and ponding event will be negligible.

Downstream Analysis

In order to ensure that the hydrologic changes designed for the Furlong Creek watershed will not exasperate flooding concerns the timing of the hydrographs was also looked at in relation to Red Creek. The peak flooding from the Furlong Creek watershed occurs before the peak from the Red Creek watershed. This allows some of the Furlong Creek flooding volume to store in areas that would otherwise be used by Red Creek. The proposed conditions timing of the Furlong Creek hydrograph in relation to the peak Red Creek hydrograph is not changed. The peak runoff rate is slightly less as a result of the mitigation and amenities. The reason the timing has not changed is because the Furlong Creek drainage area is so large compared to the amount of it that is on the University of Rochester site.

The second problem area is downstream of the project along the Red Creek tributary. Flooding is experienced by residential property owners

west of the Lehigh Valley Trail embankment. The post-development drainage to the Red Creek tributary will have a 83% reduction in the pre-development runoff rate for the 100-yr storm event and a 64% reduction in the pre-development runoff volume.

Downstream flooding conditions will not be made worse as a result of the U of R re-zone development.

- 5. Pre- vs. Post-Development Groundwater Recharge** – Will result in negligible changes to groundwater recharge conditions as a result of infiltration practices.

Portions of the project are considered “new development” because impervious surfaces are proposed on what is currently pervious land. This type of surface cover change could result in a decrease of localized groundwater recharge and increase in offsite runoff volume, particularly if the runoff from the impervious surface is collected and channeled to a large basin. In order to prevent this, the project has incorporated many green practices which encourage infiltration of runoff. The five step Green Infrastructure process outlined in the New York State Stormwater Management Design Manual (NYS SMDM) was followed.

Step #1: Avoid or minimize land disturbance by preserving natural areas.

-This was done through careful planning and documentation of critical environmental areas. Critical environmental areas on the site include wetlands, wetland buffers, old growth habitat, and significant trees.

Step #2: Determine Water Quality Treatment Volume (WQv).

-This was completed for each of the drainage areas with existing or proposed development (impervious surfaces): D.A. #1A, #2A, #2B, #2D, #2E, #3B. These results are provided in the Drainage Report.

Step #3: Reduce the WQv through RRV practices.

-This requirement has been met through the use of bioretention facilities. Detailed discussions of these practices and other alternatives along with the results of the bioretention design are provided in the Drainage Report.

Step #4: Apply Stormwater Management Practices to Address Remaining WQv.

-This requirement is met through the use of pretreatment forebays, vegetated swales and filtration devices approved for new development.

The results of the calculations are provided in the Drainage Study, Appendix A.

Step #5: Apply volume and peak rate control practices if still need to meet requirements.

-This requirement is generally not applicable. The drainage areas to the natural watercourses that receive discharge from the site have been reduced such to reduce the runoff volume and rate. This criteria does not apply to 5th order or larger water bodies such as the Erie Canal. Detention volume has been provided in the drainage with no outlet to ensure this area has enough storage volume available for additional runoff volume. Detention volume has also been provided in the drainage areas to the Erie Canal to attenuate post-development runoff rates to pre-developed conditions to meet the NYSDOT requirements and release runoff at a rate that downstream storm sewer system has capacity to handle. The results of the detention design are presented in the Drainage Study, Appendix A.

The NYS SMDM requires a percentage of the calculated water quality volume (WQv) for new development to be provided as Runoff Reduction Volume (RRv). The RRv a green practice provides is dependent on the contributing drainage area and impervious area. The project must meet the minimum RRv requirement which is dependent on the soil type. The WQv required to be provided through a standard practice is reduced by the RRv that is provided. The goal is to provide the maximum RRv possible or meet the WQv requirement completely through RRv reduction. Refer to the table below for a summary of the required RRv.

Summary of Runoff Reduction Volume (RRv)

Drainage Area	Area (Ac)	New Imp. Area (Ac)	WQv (Ac-ft)	Soil Type	Min. Reqr'd RRv (Ac-ft)	Prov'd RRv (Ac-ft)*
Subarea #2A	18.0	6.6	0.5	D	0.08	0.23
Subarea #2B	41.0	22.6	1.5		0.29	0.60
Subarea #2D	5.7	2.6	0.2		0.03	0.10
Subarea #2E	4.3	2.3	0.2		0.03	0.07
Subarea #3B	4.3	9.5	0.7		0.12	0.40

The green practices for the proposed development area are:

- bioretention facilities

Green Practices which were not taken credit for:

- Tree Planting & Preservation: RRv credit is given for certain existing trees on the site that are maintained and trees planted as a part of

the project. To achieve credit, the trees must be a certain caliber and native to the area. The U of R site is composed of wooded areas, with some of these areas containing significant old growth trees that would qualify for this credit. At this time it is also not possible to speculate the quantity of proposed trees that would qualify. Therefore, this report conservatively excludes any credit given for trees at this time. As specific projects are proposed they may evaluate the applicability of the credit and further exceed the RRv quantity stated in this report.

- **Disconnected Impervious Area:** This practice “disconnects” rooftop downspouts from the storm sewer system and directs them to a filter strip designed to promote infiltration. These practices are favorable because generally rooftop runoff is relatively free of pollutants and ideal to recharge back into the environment. The filter strip requires a longitudinal area at least equal to the drainage length of the rooftop constructed at a minimal slope. The practice should drain to an area capable of receiving runoff. This practice was not incorporated into the re-zone stormwater management plan because all rooftop runoff has already been directed to bioretention systems. The goal in developing the stormwater management plan was to concentrate the infiltration practices into regions so they could be reserved from development and easily monitored and maintained once constructed. This also leaves additional options for the final design to comply with the green development requirements.
- **Swales:** swales are vegetated swales that promote infiltration through a gradual longitudinal slope and wide bottom. They are constructed with engineered soils conducive to infiltration. This practice was not incorporated into the re-zone stormwater management plan because all the development runoff is already being directed to bioretention systems. Swales may be appropriate to use as an additional treatment measure along roads or parking areas in place of a closed conduit system. A goal in developing the stormwater management plan was to preserve all trees of value. Many of these trees are located in and around the development. Swales were avoided to limit disturbance around these trees and to their roots. This also leaves additional options for the final design to comply with the green practices requirements should the tree disturbance be determined not to be a detrimental impact in certain locations.
- **Alternative Practice/Runoff Reuse:** Capturing runoff volume and reusing it for non-potable uses is an excellent practice to reduce both runoff volume off-site and potable water usage. The U of R is open to exploring the possibility of employing this technology during

the final design stages. At this point in the conceptual design, it would only be speculation as to the amount of runoff volume which could be repurposed. Other measures such as green roofs, planters or pervious pavement may also be considered in final design, however, to ensure adequate land is available for stormwater management, these practices were conservatively excluded from consideration. This also leaves additional options for the final design to comply with the green practices requirements.

For each of the drainage areas, the provided RRv exceeds the minimum required RRv. This meets the NYS SMDM requirements and helps reduce runoff volume from the developed site. Refer to the table below for a comparison of required to proposed RRv.

Practice	Subarea #2A	Subarea #2B	Subarea #2D	Subarea #2E	Subarea #3	Total Runoff Reduction Volume (Ac-ft)
Bioretention	0.23	0.60	0.10	0.07	0.40	1.4

Minimum required RRv (Ac-ft) = 0.55

For each of the drainage areas, the provided RRv exceeds the minimum required RRv. This meets the NYS SMDM requirements and helps reduce runoff volume from the developed site.

6. Pre- vs. Post-Development Pollutant discharge – Will result in decrease in pollutant loading to the natural receiving watercourses.

Development involving increasing impervious area and conversion of wooded areas to lawn areas has the potential to increase pollutant discharge, particularly Total Suspended Solids (TSS) and Total Phosphorus (TP). The highest concentration of pollutants present in stormwater occurs during the lower intensity rainfall events, more specifically in approximately the first 1/2-inch of run-off. This runoff is calculated as the Water Quality Volume (WQv). Pollutant discharge is mitigated through practices which temporarily hold this volume to allow for infiltration or settling of pollutants. For new development, WQv should be provided so that 80% removal of the annual TSS and 40% TP is achieved. WQv should be provided in the form of Runoff Reduction Volume (RRv) and/or WQv provided as a standard practice. For redevelopment areas, 25% of the calculated WQv should be provided in a standard practice. The future development of the IPD is a combination of new development and redevelopment. For new development areas, a percentage of the required WQv has been provided as RRv. The remaining required water quality

volume for new development was added to the redevelopment water quality volume for an overall required WQv to be provided with a standard practice. This volume will be provided in the stormwater ponds which will be “undercut” with deep pools to retain 100% of the water quality volume. The water quality criteria will be achieved by providing these “deep pool” areas at the inlet and outlet to the stormwater pond. These measures along with meeting the standard design practices as included in the New York State Stormwater Management Design Manual will provide for adequate TSS and Phosphorus removal. Refer to the table below for a summary of the WQv calculations.

Water Quality Volume Summary

Drainage Area	Req'r'd. WQv from New Development (Ac-ft)	Req'r'd. WQv from Redevelopment (Ac-ft)	Req'r'd WQv for Bioretention Pretreatment (Ac-ft)	Total Required WQv (Ac-ft)	Provided WQv (Ac-ft)
Subarea #1	-	0.06	-	0.06	0.96
Subarea #2A	0.23	0.09	0.32	0.64	0.67
Subarea #2B	0.89	0.14	1.00	2.03	2.38
Subarea #2D	0.07	0.02	0.12	0.21	0.21
Subarea #2E	0.08	0.01	0.05	0.14	0.56
Subarea #3B	0.28	0.15	0.42	0.85	0.91

Using green and/or standard practices sized to the WQv requirements in the NYS SMDM is generally accepted as meeting the required TSS and TP removal. This can be verified with further analysis using the ‘Simple Method’ (Schueler, 1987) in the NYS SMDM. This method applied a pollutant loading to each cover delineation and a removal rate to each practice. Refer to the tables on the following pages for a summary of the pollutant loading using the Simple Method.

TSS Comparison of Pre- & Post Construction Pollutant Loading

Drainage Area	Existing Pollutant Loading (mg/l)	Pollutant Removal from WQv Practices (mg/l)	Proposed Pollutant Loading (Post-WQv Practice) (mg/l)	Decrease in Pollutant Loading Post-Development (Post WQv practice)
D.A. #1	2,389,176	108,665	1,715,449	28%
D.A. #2	11,226,382	13,250,243	14,181,703	-26%
D.A. #3	1,693,944	6,819,166	403,177	76%
D.A. #4	51,737	0	0	100%

TP Comparison of Pre- & Post Construction Pollutant Loading

Drainage Area	Existing Pollutant Loading (mg/l)	Pollutant Removal from WQv Practices (mg/l)	Proposed Pollutant Loading (Post-WQv Practice) (mg/l)	Decrease in Pollutant Loading Post-Development (Post WQv practice)
D.A. #1	8,496	457	6,137	28%
D.A. #2	40,426	40,481	55,506	-37%
D.A. #3	6,211	26,107	161	97%
D.A. #4	301	0	0	100%

Pollutant Loading Per Cover Delineation

Cover Delineation	-	Roof	Street	Lawn	Pkg	Wds/Mdw	Water
Pollutant Conc. (°C) (mg/l)**	TSS	9.00	468.00	602.00	27.00	3	2
	TP	0.14	0.00	2.10	0.15	0.10	0.10

**From Appendix A of the NYS SMDM.

Annual Runoff for Pollutant Loading Contribution (in)

Drainage Area	% Impervious			Annual Runoff (in)		
	Exist. D.A.	Prop. D.A.	D.A. to Practice	Exist. D.A.	Prop. D.A.	D.A. to Practice
D.A. #1	15%	15%	61%	26	28	110
D.A. #2	21%	61%	71%	37	110	126
D.A. #3	21%	32%	55%	38	58	98
D.A. #4	4%	0%	0%	7	0	0

Pollutant Removal Practices and Net Efficiency Removal Rate

Drainage Area	Pollutant Removal Practices	Net Poll. Removal Efficiency Rate	
		TSS	TP
D.A. #1	Bioretention & Det. Pond	97%	80%
D.A. #2	Veg. Swale, Bioret. & Det. Pond	100%	88%
D.A. #3	Veg. Swale, Bioret. & Det. Pond	100%	100%
D.A. #4	Reduction of Drainage Area and removal of all impervious area in D.A.	-	-

The project will result in a higher pollutant loading rate as a result of the increase in development. After the post-constructions stormwater management best management practices (BMP's) are considered, though the project will result in a decrease pollutant loading rate to natural receiving systems.

Mitigation

Stormwater management and mitigation measures that will be used when buildings are built will meet and exceed the NYS DEC and Town of Brighton code requirements. With the proposed stormwater mitigation measures in place, stormwater volumes and runoff rates leaving the site and directed to natural receiving water bodies will be reduced to 20% less (minimum) from what they are today. A larger amount of runoff will be directed towards the Erie Canal. Water quality measures will be installed to remove runoff pollutants prior to discharge from all developed points on the site.

Stormwater detention facilities – ponds and underground storage and conveyance piping - will be installed upstream of each of the Rezone Property stormwater discharge points to attenuate post-development runoff rates and volumes to less than pre-development conditions. The ponds will include ‘deep pools’ at the inlet and outlet ends to provide settling areas for runoff pollutant removal.

Existing flooding conditions that have been experienced along the north side of the Crittenden Road properties will not be made worse as a result of the future development of the South Campus.

The green practices for the proposed development, to reduce runoff volumes and improve water quality, will include installation of bioretention facilities and installation of vegetated swales. These treatment facilities receive and treat stormwater runoff from paved areas. The swales and bioretention ponds slow or pool the flow and remove contaminants and sedimentation as water is filtered through grass strips, planted soil and other planted materials, then infiltrating into underlying organic soils and sand beds.

Wetlands will be protected and avoided, or enhanced as endorsed and approved by the regulatory agencies and the Town. Enhancements will include expanded habitat in and around the existing wetland areas which adjoin existing habitat areas. By constructing wetland mitigation areas adjacent to existing wetlands, a higher quality, contiguous habitat area will be achieved. The wetland mitigation areas will not consist entirely of open water, but will include a fringe area which will be planted with native plant materials which will naturalize and provide habitat as well as serve as a buffer protecting the wetland area. This area of vegetated shallows will have a depth of zero to 36 inches, will provide a good environment for aquatic plants and wildlife.

In addition to the proposed stormwater management facilities, other amenity features are proposed to reduce runoff to the Furlong Creek area where residents along Crittenden Road experience flooding. Proposed amenities to reduce flooding include:

- Revising storm sewer connections on the developed portion of the South Campus (in Whipple Park) to redirect drainage away from flooding area
- Re-grading a channel to pond stormwater north of that area, avoiding some of the runoff from entering the Furlong Creek channel
- Construct an outlet in the south wetland area to control ponding elevation (thus reducing the potential to overtop the berm and cause flooding)

Implementation of these amenity features will help to reduce some of the flow to low-lying areas, but will not eliminate the flooding conditions during wet periods due to the fact that the runoff from the U of R is only a small contributor to this volume in relation to the offsite drainage area.

Refer to the Drainage report in Appendix A for additional detail on Stormwater Management and mitigation plans.

C. Terrestrial and Aquatic Ecology

The following sections of the DGEIS remain unchanged, and are therefore incorporated by reference. Please refer to the November 2005 DGEIS Section VI. C. Page 55.

- 1) Vegetation
- 2) Wildlife
- 3) Critical Environmental Areas

Below is a brief summary comparison of the potential impacts of the DGEIS Concept Plan as compared to the current Master Plan Concept plan. More detailed information on Woodlots and Wetlands follows.

DGEIS Concept Plan	S-DGEIS / Master Plan
<p>The Rezone Property is partially developed. Approximately 85 acres of the Rezone area are developed with impervious surface (buildings, pavement) or otherwise mowed or maintained areas. The lands contain federal wetlands, an extension of a state wetland, and some wooded areas, some of which are mapped as Woodlot EPODs.</p> <p>The wildlife species are common year-round or seasonal varieties that prefer shrub thickets and forest edges as habitat. The chorus frog habitat will remain undisturbed or be mitigated. Sufficient amount of habitat and greenspace will remain upon full buildout of the Rezone Property.</p> <p>The site contains 140 trees, of varying size, species, and health that meet the Town's criteria as being "significant trees" (defined as greater than 30-inches in diameter at breast height, dbh). Only 14 of the 140 trees were listed in Good condition; many are located in protected buffer areas. The University has committed to meet with the Conservation Board on-site to examine significant trees. The University proposed to limit future development to ensure retention of a minimum of 25 percent of the woodlot EPODs on the property, though it would be likely that far more than this would remain undisturbed.</p> <p>There are no Critical Environmental Areas on the Rezone Property</p>	<p>Potential growth areas as shown in the Master Plan are clustered around existing areas of development, including adding housing near the southern portion where housing already exists, and concentrating all other development to the north portion of the property near the highway and along Murlin Drive. The potential disturbed area shown on the Master plan is similar in size and location as compared with the concept plan in the DGEIS.</p> <p>As identified in the DGEIS: sufficient amount of habitat and greenspace will remain upon full buildout of the Rezone Property; wetland areas will be protected and additional buffer areas will remain; significant tree locations will be considered when future site plans are being prepared for review and approval by the Town. As indicated in the Master Plan, the change of use from institutional buildings to more residential use south of the Laser Lab and a shift of building area further to the east will result in lesser potential impacts to the woodlot areas.</p> <p>Based on the current Master Plan Concept Site Plan (“The Plan”), the University proposes to limit future development to ensure retention of wetlands and old growth habitat, to ensure retention of woodlot EPODs on the property as much as is practicable.</p>

4) Woodlot EPOD – areas of disturbance

The Woodlot Quality Assessment completed as part of the 2005 DGEIS identified woodlot areas which fell within the proposed development pods. An updated analysis of the existing on-site Woodlot EPOD areas has analyzed and identified all Woodlot EPOD areas which exist on the South Campus parcel. These Woodlot EPOD areas are depicted on Figure 7.

The development pod concept depicted in the DGEIS has been replaced by the current Master Plan. Potential development areas have been revised per the Master Plan design process, and to address comments received during the DGEIS public review process. The Rezone Property contains approximately 97 acres of Woodlot EPOD, as depicted in Figure 7. The action of rezoning the parcel will not jeopardize any of the woodlots, and future development will be sensitive to wooded areas and significant tree locations.

In October and December of 2013, the South Campus tree survey was updated, woodlots were reviewed in the future development area, and significant trees were identified. In addition, the old growth habitat areas have been identified as preservation areas, and the Master Plan has been revised to avoid future development in those zones. Please refer to Figure 7 for old growth habitat areas, and Figure 8 for locations and conditions of significant trees in the South Campus. The significant tree survey can be found in Appendix B. Also located in Appendix B is an update to the tree survey conducted in 2005. Urban Forestry, LLC conducted an update to the tree survey in December of 2013, revisiting the site and the updating the data collected in 2005 in order to bring it current.

As the South Campus site begins to be developed, the U of R will implement a replanting program that focuses on re-planting and replacement of trees with species that are native to the South Campus site. Tree placements will be carefully planned to complement the existing natural habitats, and to enhance the existing and proposed buffer areas. Proposed disturbance to areas of Woodlot EPOD will be subject to Town review on a case by case basis as the build out contemplated by the Master Plan is done over time.

5) Wetlands

The DGEIS identified wetland areas located on the Rezone Property, and these areas were recently revisited in order to update mapping through the performance of a new on-site wetland delineation. The S-DGEIS contains the data from the updated wetland delineation which was completed in the Fall of 2013. The new delineation boundary is being coordinated with the Army Corps of Engineers and the NYS DEC. The Master Plan layout was modified to acknowledge changes which occurred to the wetland boundaries, and the

associated 100' buffer around the NYSDEC regulated wetland. Refer to Appendix C for the updated wetland documentation and mapping.

As demonstrated in the past, the U of R will make every effort to avoid disturbances in and near wetlands, and follow guiding principles to maintain significant natural areas around the wetlands in excess of the required amount.

As each proposed project in the South Campus becomes a reality, the wetlands areas will be re-evaluated and re-mapped at that time to investigate any ongoing changes to the wetland boundaries.

Mitigation

There are approximately 97 acres of woodlots on the South Campus parcel; based on the Master Plan Concept Site Plan, approximately 57 percent will remain undisturbed. The areas of old growth habitat fall within the woodlot zone which will not be disturbed.

The wetland areas will be avoided or enhanced to maintain or provide improvements to wetland quality and habitat areas.

Maintaining these habitat areas will preserve large segments of the site's natural character. The 100 foot buffer placed adjacent to the neighboring residential properties will ensure a natural band or wooded areas along the perimeter of the site, with large areas of woodlot, old growth, and wetlands following the western edge of the site adjacent to the Lehigh Valley Trail. In addition, the parcel in the northwest corner of the South Campus property (West of Kendrick Road and North of East River Road) will not be developed.

Some portions of Woodlot EPOD which will be impacted during development will be restored through the implementation of a replanting program. Species selection will be comprised of a list of native tree species that can already be found on the South Campus site. The survey of existing trees noted that the site is comprised of a variety of maple species, oaks, ash, beech, and willow, among others. Areas slated for replanting will receive a mix of species in order to prevent a monoculture, and to mimic the diversity that naturally occurs on-site. To avoid the perception of unnatural straight rows, the trees will be planted in an irregular, offset manner. Spacing the trees irregularly will establish a stand that is seemingly natural in its placement, and will produce a more significant natural buffer, as visual penetration through the stand of trees will be reduced.

Saplings with trunks of one to two inches in diameter will be densely planted in the areas designated for woodlot restoration. Bare root plants may be utilized if they are planted in early spring, otherwise container grown or balled and burlapped stock will be employed. Planting will occur in either spring or fall to ensure the highest rate of success. Areas will be slightly overplanted, with tree

spacing of eight to 12 feet, keeping in mind that some trees will die out in favor of others.

In order to ensure successful plantings, a post planting maintenance program will be established to initially control competing vegetation until the trees begin to become established. Watering is the most crucial maintenance procedure to ensure plant establishment and survivability. When seasonal rainfall is inadequate to provide sufficient soil moisture for good tree establishment, the newly planted areas will be routinely provided water until the areas become self sufficient. A thorough watering every five to seven days is considered ample when rainfall is insufficient to maintain soil moisture content. The use of water-holding containers with small drain holes may be employed. Shredded hardwood mulch rings will be placed and maintained which will help keep the base of the tree free of competing vegetation, and help to retain moisture in the soil. Tall growing weeds that can hinder the establishment of saplings will be controlled in a large enough area around the plant to ensure competition from the weeds does not adversely affect survival of the tree.

D. Land Use and Zoning

This section of the DGEIS remains unchanged, except as noted below, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section VI. D. Page 70.

The 'pods' are no longer referenced in the potential build area. Also, the total square footage of potential build-out has been reduced. Please refer to Section I. C. for the description and graphics of the Concept Plan changes and comparisons from the DGEIS to the S-DGEIS. Refer to Figure 4 for the current Master Plan development plan.

The following is a list of building square footages based on the revised Master Plan:

Residential: (4 floor buildings)

SC-1:	24,000 gsf
SC-2:	24,000 gsf
SC-3:	46,400 gsf
SC-4:	24,000 gsf
SC-5:	24,000 gsf
SC-9:	24,000 gsf
SC-7:	24,000 gsf
SC-8:	24,000 gsf
SC-9:	24,000 gsf
SC-10:	46,000 gsf
SC-11:	24,000 gsf
SC-12:	24,000 gsf
SC-13:	24,000 gsf
SC-14:	24,000 gsf
SC-15:	24,000 gsf
SC-16:	24,000 gsf
SC-18:	24,000 gsf
SC-19:	24,000 gsf

Subtotal:	476,400 gsf
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Office/Research/Clinical: (1-5 floor buildings*)

SC-20:	125,000 gsf* up to 90 ft. in height
SC-21:	100,000 gsf
SC-22:	125,000 gsf
SC-23:	100,000 gsf
SC-24:	100,000 gsf
SC-25:	100,000 gsf
SC-26:	100,000 gsf
SC-27:	100,000 gsf
SC-28:	100,000 gsf
SC-29:	20,000 gsf
SC-30:	140,050 gsf
SC-31:	105,000 gsf
SC-32:	75,000 gsf

Subtotal:	1,290,050 gsf
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In addition to having made refinements to the Master Plan, the U of R has also moved forward with plans to develop what will be the first building constructed from the Master Plan. A new imaging building is proposed to be located in the eastern portion of the South Campus property along East River Road. The location of the proposed imaging building can be found on Figure 4, illustrated as building SC-30 on the Master Plan. The proposed imaging building is being

planned to ultimately be four stories in height with a total square footage of 121,000 gross square feet. However, initially it will be constructed as a three story building with a 34,000 square foot footprint and 29,000 square feet each on floors two and three. The facility will expand the University of Rochester Medical Center’s ability to provide convenient access for outpatient imaging and autism services for children.

Below is a brief summary comparison of the potential impacts of the DGEIS Concept Plan as compared to the current Master Plan Concept plan.

DGEIS Concept Plan	S-DGEIS / Master Plan
<p>The DGEIS identified 1,972,200 square feet of expansion of office/research and supporting uses on the Rezone Property. Expansion of residential uses was not proposed. Uses were consistent with the University’s current uses, as outlined in the DGEIS. To minimize potential impacts of University expansion in areas adjacent to existing residential neighborhoods, natural screening and proposed buffer areas and infill planting were proposed. Visual assessments and photo simulations were provided</p>	<p>Reduction of overall full build-out square footage to 1,766,450 square feet. As compared to the DGEIS concept plan, the Master Plan indicates an addition of 476,400 square feet of residential buildings, and a decrease in institutional use of over 682,000 square feet. Office/Research and Clinical uses are anticipated. The residential buildings are located near the existing residential land uses, and the institutional uses have been pushed northerly along the highway corridor. In addition, and as identified in the DGEIS, expanded buffer zones and infill plantings are proposed to minimize potential impacts to the surrounding residential neighborhoods. The residential buildings will be limited to 2-4 stories; the taller buildings have been moved northerly, away from the residential uses. Refer to Figures 2 and 3.</p>

IPD area and density calculations are outlined below:

- Total site area 180 acres
- Total area of wetlands/buffer on-site +/-20 acres*
- Total site area less wetland area +/- 160 acres

- Existing developed area +/- 44 acres
- New developable area +/- 80 acres

- **Existing Building Area** 813,250 GSF
 - Laser Lab 297,571 GSF
 - Alumni & Advancement Center 133,191 GSF
 - Whipple Park 338,600 GSF
 - U of R Offices 43,888 GSF
- **Proposed building area** 1,766,450 GSF
 - (Institutional 1,290,050 GSF)
 - (Residential 476,400 GSF)

- **Total building area, existing + proposed** 2,535,812 GSF
(43,888 GSF being removed)

Existing Density (current conditions)

Existing Building area on total project area
 $813,250 \text{ GSF} / 160 \text{ acres} = 5,085 \text{ GSF/acre}$
 Floor area ratio (FAR) = 0.12

Density as proposed in the original DGEIS*

Total Building area (existing & proposed) on total project area
 $2,643,478 \text{ GSF} / 160 \text{ acres} = 16,520 \text{ GSF/acre}$
 Floor area ratio (FAR) = 0.38

Proposed Density of current plan

Total Building area (existing & proposed) on total project area
 $2,535,812 \text{ GSF} / 160 \text{ acres} = 15,850 \text{ GSF/acre}$
 Floor area ratio (FAR) = 0.36

*Note: Wetlands were not subtracted from the total site area in the DGEIS, as it was completed prior to the Town of Brighton adopting regulations requiring the subtraction of wetlands from density calculations. The wetlands have been subtracted from the total site area for this SDGEIS, therefore, the results yield a higher density than the DGEIS, despite a reduction in the proposed developable gross square footage.

Please refer to Appendix H for the current Master Plan concept site plan and the draft ordinance for the proposed IPD. These together constitute the “Current Plan”.

Mitigation

As compared to the original DGEIS, the current plan reduces the overall proposed square footage of full build out, reduces the institutional use by 682,000 square feet and increases the residential component by 476,400 square feet. The concept site plan has been updated to shift the institutional buildings to the north, primarily along the along the roadway corridors and to cluster other buildings to better protect wetlands and woodlot habitats and to avoid 11 acres of old growth habitat areas. Buffer areas have been increased and infill plantings are proposed to enhance screening.

Over the passage of time, the University and Medical Center have continued to grow and expand services to the community. The current hospital expansion will require the consolidation and relocation of its outpatient imaging facilities. The South Campus is the proposed location for the relocation of those facilities via the Imaging Sciences Building, which would be the first proposed building in the Rezone Property. The University would implement the mitigation measures outlined in this document for the construction of the building, including wetland protection, stormwater management, replanting of trees, water line extension, buffering and landscaping.

E. Historical and Archeological Resources

This section of the DGEIS remains unchanged, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section VI. E. Page 75.

Below is a brief summary comparison of the potential impacts of the DGEIS Concept Plan as compared to the current Master Plan Concept plan.

DGEIS Concept Plan	S-DGEIS / Master Plan
The DGEIS recommends that further assessment of impacts be completed at the time a particular project is proposed, since the proposed action relates to rezoning only, and a specific site plan is not proposed at this time	As outlined in the DGEIS, the same logic applies to the Master Plan; further assessment of potential impacts to be completed at the time a specific project is proposed. The Master Plan land use along with the proposed, enhanced buffers will likely avoid any impacts to potential historic structures on neighboring properties.

Mitigation

No impacts are anticipated, therefore, no mitigation is proposed.

F. Traffic / Transportation Network

The Traffic Impact Study (TIS) has been updated and is included as Appendix D of this document.

Future Development

A comprehensive analysis of the surrounding street network was performed to determine what impacts the proposed rezoning, and resulting potential future development would have on the street network. As there is no specific development associated with the rezoning action there will be no immediately noticeable impacts. However, the intensity of uses associated with an Institutional zoning designation is much greater than that of a residential zoning designation. If the property were used entirely for residential development, the number of trips generated would total 161 trips and 215 trips during the weekday morning and weekday evening peak hours, respectively. The Institutional development would generate greater volume increases, though numbers would vary depending on building uses. Accordingly, there would be an increase in impacts to the adjacent street network, over those likely to be experienced if the property were used for residential development purposes, which are illustrated below by using two example build-out scenarios.

The future development will be served by one (1) main drive, the re-aligned Murlin Drive at the newly constructed roundabout (by NYS DOT), and one (1) additional existing driveway on East River Road. Murlin Drive is approximately half a mile long, into the Rezone Property, which provides access to Whipple Park Apartments. A second point of access is on East River Road at the existing driveway to the University's Laboratory for Laser Energetics (LLE). This existing driveway is proposed to access any development that would take place along E. River Road, east of LLE.

Future Build Conditions

Two build-out scenarios for the South Campus, from 130,000 sf to 1,766,450 sf, have been analyzed up to the year 2027 to show effects of the future development at different stages. The future analysis periods examined the roadway geometry with the currently planned NYSDOT improvements. There are several improvement projects programmed for the transportation network in the vicinity of the South Campus that will have a dramatic and positive impact on the current roadway network.

Recently constructed, the first phase is comprised of the new East River Road on-ramp to I-390 southbound. The second phase includes a new on-ramp to I-390 northbound from Kendrick Road and is currently under construction. These two

projects also include associated lane additions and other improvements that will further alleviate congestion in the area. The Kendrick Road ramp will be completed by the fall of 2014.

The next phase planned by NYS DOT is the proposed on-ramp to I-390 from W. Henrietta Road – a ¼ cloverleaf to serve northbound traffic heading to I-390 northbound which will further eliminate the left-turn movements that cause most of the congestion and back-ups. This project is currently out to bid and is scheduled for completion in 2015.

The last phases; E. Henrietta Road bridge over the Erie Canal, and the I-390 ramp improvements at E. Henrietta Road interchange are under design. Those projects are scheduled to be completed by 2019. These projects, along with future NYS DOT projects outlined in the Southern Corridor Mobility Study, will continue to be coordinated over time, as each project takes place. Please refer to Appendix C for the NYS DOT's I-390 Plan.

Trip Generation and Distribution

The proposed rezoning itself will not generate additional traffic volumes to the South Campus. However, when future development takes place in the South Campus, new trips would be generated. New traffic volume projections were estimated based on information published in the Institute of Transportation Engineers' (ITE) *Trip Generation, 9th Edition, Volume Two*. The land uses proposed for the South Campus include Office, Research, Education, Clinical, and Residential developments. Of the 903 total trips to be generated by the full-build (1,766,450 SF in 2027) during the weekday morning peak hour, 626 trips are anticipated to enter the site and 187 trips are anticipated to exit the site. During the weekday evening peak hour 989 total trips are projected; 334 trips are anticipated to enter the site and 655 trips are anticipated to exit the site. A 5-year and 20-year full-build out analysis is presented in the TIS. These build scenarios were developed to show the likely pattern of phased improvements over the course of the next 20 years. The trip generation calculations are presented in Appendix 'B' of the TIS located in Appendix 'D' of this document.

The anticipated traffic to be generated by future growth in the South Campus was distributed on the adjacent highway system through the use of the Genesee Transportation Council's (GTC) Tmodel2 computer software program. The software data is taken from the GTC's year 2000 and 2025 travel demand models for the morning and evening peak hours. The surrounding population centers, existing traffic patterns, and logical routing were also taken into consideration and anticipated approximately 85 percent of the traffic generated to and from the South Campus would use the I-390 and I-590 expressway systems. Therefore, the vast majority of the anticipated traffic volumes related to future South Campus development will have negligible impact to the neighborhood streets. The trip distribution and traffic volume figures are presented in Appendix 'C' of the TIS located in Appendix 'D' of this document.

Summary of Traffic Impacts

The analysis concluded that the adjacent roadway network will accommodate the 20-year full build scenario once the first three phases of the ongoing NYS DOT improvements are in place. All three phases will be completed by 2019. The results also indicated that the study area has the capacity at this time to handle traffic generated by approximately 130,000 square feet of the development, without the need for a signal at the E. River Road site drive.

A majority of the traffic generated to and from the South Campus area is anticipated to use the expressway system. As a result the local roadways will have insignificant delays associated with the 130,000 square feet and the 1.7 million square feet of future development. Portions of the four studied I-390 interchange intersections currently operate under heavy traffic conditions and are anticipated to continue to operate under heavy volumes during the morning and/or evening peak hours.

Due to the different types of land use anticipated as part of the future south campus growth, projected traffic volumes will vary. For example, 250,000 square feet of research buildings will generate less traffic than 250,000 square feet of office buildings. Therefore, it is feasible that up to 1.2 million square feet of development primarily devoted to research could be built with minor mitigation measures. As each proposed project within the south campus becomes a reality over the next 20-25 years, the associated trip generation and potential impacts to affected transportation system areas will be assessed. Associated mitigation measures, as necessary, will be identified and compared to the mitigation measures outlined in the GEIS. The University has also committed to updating the University's regional Traffic Study every 5 years (via City of Rochester legislation) to monitor and assess the traffic impacts of future growth. In addition, the University will submit a trip generation assessment on each project application for review and submittal by the Town and the state and county DOTs. An assessment or analysis will be made to determine potential impacts to the area roadway network. The Town shall be reimbursed for all costs associated with the review of each submitted traffic study.

Transit, Pedestrian and Bicycle links

The South Campus is currently served by both the University's Shuttle system, which extends into Whipple Park via Murlin Drive, and by public transit on E. River Road. The need for more frequent shuttle trips is anticipated into both the residential and institutional areas as growth begins. The University will continue to work with RGRTA to extend bus stops to new growth areas along E. River Road.

The growth in the South Campus will generate the need to extend the existing pedestrian network from the public sidewalk system down Murlin Drive and into both the residential and institutional growth areas. Several private trails exist throughout the old growth habitat and wetland areas on the western portion of the South Campus. It is anticipated that the building sidewalk systems will be

linked with the private trail networks throughout the South Campus. Formalized trails are not being proposed through the woodlot areas in order to protect wetland areas, the areas of old growth habitat, and considerable areas of woodlot will be preserved to maintain natural habitat for the benefit and enjoyment of those living and working on the South Campus site.

The Town's Bicycle/Pedestrian Master Plan has also been reviewed. The Town Trail is located along the entire length of the western boundary of the South Campus, where there are links to the Lehigh Valley Trail and several existing, private trail connections. While the initial growth will likely occur along East River Road, opportunities for additional pedestrian and bicycle connectivity will continue to be explored as future growth evolves into the interior of the South Campus.

Refer to Appendix H, "The Plan", for figures showing existing and future transit, bicycle and pedestrian paths and links.

Mitigation

The NYS DOT and the University propose mitigation measures within the corridor to minimize the impacts of the additional traffic on the area roadway network. The NYS DOT completed the I-390/E. River Road ramp construction project in 2013. Several other NYS DOT projects are underway, at various stages of construction, planning or design. Since 85 percent of the traffic generated would use the expressway system, the locations of major improvements are limited to the expressway intersections and ramps, and East River Road, which serves as the University's main. The NYS DOT will be completing all those projects.

Listed below are additional mitigation measures recommended for the adjacent street network to accommodate the 5-year and 20-year plans. Existing and proposed lane configurations are provided in Appendix 'C' of the TIS.

5-Year Plan

The following improvements are recommended to accommodate the proposed development for the 5-year build condition:

Laser Lab driveway on East River Road:

- When the first building project is underway on East River Road, the University will widen the existing service road from one lane to two lanes to accommodate the queues for vehicles exiting the South Campus and turning onto East River Road.

Improved operational levels of service (LOS) will be provided by optimizing signal timings, phasing and/or coordination at the following intersections:

- Elmwood Avenue & Kendrick Road

- Elmwood Avenue & Eastman Dental Driveway
- Elmwood Avenue & East Drive
- Elmwood Avenue @ Mt. Hope Avenue,
- Crittenden Boulevard @ Kendrick Road,
- Crittenden Boulevard @ Mt. Hope Avenue,
- Westfall Road & Mt. Hope Avenue,
- Westfall Road @ East Henrietta Road,
- East River Road & West Henrietta Road

As each project is proposed, the University will evaluate the potential impacts at these intersections and coordinate the necessary signal timing changes with the NYS DOT, Monroe County DOT and the Town.

20-year Plan

In addition to the measures recommended above for the 5-year build, the following improvements are recommended to accommodate the future development for the 20-year build condition:

Laser Lab driveway on East River Road:

- The University will install a two-phase coordinated traffic signal; the estimated timeframe is 2018.

Elmwood Avenue & Kendrick Road:

- The University will construct an additional WB left-turn lane; the estimated timeframe is 2024.

East River Road & West Henrietta Road

- Install an exclusive WB right-turn lane and two, through lanes
- Install an exclusive SB right-turn lane

It is anticipated that cost of this work would be shared by the University and other contributing developers; the anticipated timeframe is 2028.

Westfall Road & Mt. Hope Avenue

- Modify the existing 2-lane WB approach to 1 left-turn lane and a shared left-turn/through/right-turn lane
- Split-phase the eastbound and westbound movements

It is anticipated that cost of this work would be shared by the University and other contributing developers; the anticipated timeframe is 2028.

Improved operational levels of service (LOS) will be provided by optimizing signal timings, phasing and/or coordination at the following intersections:

- Elmwood Avenue & Kendrick Road

- Elmwood Avenue & Eastman Dental Driveway
- Elmwood Avenue & East Drive
- Elmwood Avenue @ Mt. Hope Avenue
- Crittenden Boulevard @ Kendrick Road
- Crittenden Boulevard @ Mt. Hope Avenue
- Westfall Road & Mt. Hope Avenue
- Westfall Road @ East Henrietta Road
- East River Road & West Henrietta Road
- East Henrietta Road @ South Avenue
- East Henrietta Road & Iola Circle
- West Henrietta Road & Crittenden Road

As each project is proposed, the University will evaluate the potential impacts at these intersections and coordinate the necessary signal timing changes with the NYS DOT, Monroe County DOT and the Town.

Synchronize traffic signals along Kendrick Road at the following intersections:

- Kendrick Road @ Alpha Road (proposed street per University Master Plan)
- Kendrick Road @ Lattimore Road
- Kendrick Road @ Westmoreland Avenue
- Improved pedestrian clearance times where appropriate

The University will evaluate the timing of the needed synchronization of traffic signals as development evolves. Work will be coordinated with the NYS DOT, Monroe County DOT, the Town and the City.

The roadway mitigation measures identified above have been provided to serve as an indicator of the magnitude of the improvements required to meet the desired operational levels of the street/highway network. Improvements within the I-390 corridor will be completed well before the 20-year full-build timeframe, so only minor changes would be required to the adjacent street network. The additional lanes along E. River Road were added to relieve congestion and to provide additional capacity and queue lengths for the increased traffic. The University donated some land along E. River Road for right-of-way dedication to accommodate the necessary roadway widening.

G. Utilities / Energy

This section of the DGEIS remains unchanged, with the exception of the water usage, as described below, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section VI. G. Page 79.

Below is a brief summary comparison of the potential impacts of the DGEIS Concept Plan as compared to the current Master Plan Concept plan.

DGEIS Concept Plan	S-DGEIS / Master Plan
<p>It was concluded that the existing water distribution and sanitary collection systems were adequate for the proposed expansion of the South Campus. Further, the rezone would result in a lower water demand on the system than the possible developments under the existing zoning and projected zoning for the Town of Brighton Comprehensive Plan. The full build out of the Rezone Property would require extensions of the private utilities (for additional power, gas usage and telecommunications systems).</p>	<p>The Master Plan decreases the amount of institutional land use and increases the amount of residential land use. As compared to the DGEIS, a minor increase to the water demand would likely result. Based on recently completed water system analysis for the proposed Imaging Building on E. River Road, a new 8-inch service loop is proposed to connect the existing Murlin Drive main to the existing water main loop surrounding the adjacent LLE building. The study concluded there is adequate flow, but that fire and domestic booster pumps may need to be added to new buildings, to provide adequate pressure at the building, as necessary. During final design of each future project, further analysis and water reports will be prepared and submitted to the Town. The University currently has no other plans for major expansion into the South Campus. The University is also actively working at reducing water demand throughout their facilities via water saving fixtures and other sustainable initiatives. Detailed water calculations and demands on the public systems will be required and evaluated as each future site plan is submitted to the Town.</p>

Mitigation

The South Campus is served by adequate public water and sanitary sewer systems, as well as electric, gas and telecommunications systems. The University will continue to work with the Town and the County to construct utility service extensions into the South Campus as future development is proposed. Water and sanitary sewer systems will be analyzed as each new building is proposed to ensure management of flows without impacting the surrounding area.

Based on recently completed water analysis for the proposed Imaging Building, a new on-site water line ‘loop’ extension will be constructed by the University. Pumps will be installed in the building to ensure adequate fire protection. The University is currently seeking approval of this work from Monroe County Water Authority (MCWA), which has agreed to provide service to the site.

With the completion of the new electric substation on Kendrick Road, there will be more than adequate electric supply for the community, including the full build-out of the South Campus.

H. Community & Neighborhood Character

Since completion of the DGEIS, the University has completed work on two major initiatives: development on a new strategic plan and a comprehensive master plan. The two plans have been developed in concert, resulting in a Master Plan that is complementary with the objectives of the strategic plan addressing the quality and growth of the University. The Campus Master Plan was adopted by the University in 2009.

Community resources

In response to comments received during the public comment period of the DGEIS, the Concept Plan for the South Campus portion of the Master Plan was re-drafted to increase the residential component and decrease the potential areas of the institutional building component, as outlined below.

- **Residential:** The original concept plan in the DGEIS did not include proposed residential square footage. The Master Plan added approximately 476,400 square feet of residential buildings, which will increase the housing area in the south Campus from 338,600 to 815,000 square feet.
- **Office/Research/Clinical care:** As compared to the concept plan in the DGEIS, the Master Plan proposes a reduction in the planned build out of these types of uses by approximately 682,000 square feet. These building locations are proposed along the Rte. 390/ E. River Road corridors, away

from the residential neighbors and streets. Anticipated building heights are 4-5 stories high maximum.

- **Buffers:** An expanded buffer surrounding all uses from existing residences. The non-residential buildings are concentrated along the highway and E. River Road, much further away from the adjacent residential neighborhoods, as compared to the concept plan included in the DGEIS as part of the original application.

Regarding potential visual impacts, the DGEIS identified measures to mitigate via building siting, buffering and additional plantings. The Master Plan concept plan provides further mitigation measures for buffering, building siting and density, as detailed above.

Please refer to Section VI. Paragraph I. below regarding proposed changes to potential Police activities in response to police service calls.

In the rezoning process, by way of the incentive zoning mechanism provided in the Town's Comprehensive Development Regulations, the University will work with the Town Board to fashion an appropriate amenity that will serve to reduce fiscal impacts to the Town's budget caused by the buildout of the South Campus and other consequent impact on Town services. At the same time, this amenity will serve as a mitigation to impacts to Town services. As an aside, it should be noted that, by removing the approximately 3.14 acre parcel dedicated to the RGE Substation from the IPD lands (refer to Section I.B above: "Changes and Additions to the DGEIS", p.1, first bullet point), the University has put back on the tax rolls a parcel that will add significantly to the Town tax revenues in amounts far beyond any impacts to the Town budget.

Impacts to other commercial facilities

The University is a tenant in a number of properties in Brighton including Clinton Crossing, Corporate Woods and Brighton Business Park. Leasing provides the University with the flexibility to adapt and respond to market demands and economics. It affords the University greater flexibility than just only relying on owned facilities. The use of Leases is strategic and growing. Currently the University leases approximately of 700,315 square feet of space in the Town of Brighton. The November 2005 DGEIS reported a total of 388,614 square feet of space, so the amount of U of R lease space in Brighton has nearly doubled since 2005. This figure is dynamic and constantly changing subject to University needs.

The University has no plan to simply vacate wholesale its leased facilities in the Town of Brighton and relocate them to the South Campus or anywhere else. Any adjustment to its leased facilities or, for that matter, any owned facilities, will always be made on a case by case basis The only planned

building at this time on the South Campus property in Brighton will principally house out-patient clinical programs in imaging science and pediatrics currently located at Strong. This will enable us to decompress the main campus of the Medical Center in the City of Rochester to allow for facility improvements for enhanced inpatient services.

The proposed action is sensitive to the intent of the Comprehensive Plan of the Town of Brighton, especially north of the north line of Whipple Park, which called for that acreage to be developed for Institutional use and substantively to the south with residential development.

Mitigation

The Master Plan reflects a conscious effort to lessen impacts to the adjacent neighborhood through a reduction in the intensity of the proposed development. The South Campus boundary which runs along the north side of the properties fronting Southland Drive has been used as a limit to the zone in which institutional uses will be developed. A 100 foot buffer has been placed along the campus edge adjacent to residential uses, consistent the current IPD regulations. Preservation of this natural buffer will help to screen future development from existing residences. Additionally, these buffers will be supplemented, where needed, by a replanting program (as discussed above) to increase the effectiveness of the buffer edge as a screening mechanism.

In response to comments received, the University has decreased the proposed square footage of institutional use by 682,000 square feet in favor of increasing the residential use by 476,400 square feet, thus lessening the intensity of the proposed development from that which was presented in the DGEIS. The southern half of the site will be developed with residential buildings, and no direct connection will be made to Crittenden Road. In addition to the 100 foot buffer, a 3-acre parcel of land at the southern end of the site adjacent to Crittenden Road will be left in its natural state both to serve as an added buffer, and in an effort to have a successive decrease in intensity from the East River Road area, moving south to Crittenden Road.

The Master Plan will integrate with the adjacent neighborhood by connection to the existing sidewalk system along the south side of East River Road, and the Lehigh Valley Trail. Following reconstruction of the Kendrick Road Bridge, the South Campus site will have improved accommodations for pedestrians and bicyclists to the vast off-road trail network found throughout the area.

As described above, the University will work with the Town Board to fashion an appropriate amenity that will serve to reduce fiscal impacts to the Town's budget and impact on Town services caused by the buildout of the South Campus. This amenity will serve as mitigation to impacts to Town services. By removing the approximately 3.14 acre parcel dedicated to the RGE Substation

from the proposed IPD lands, the University has put back on the tax rolls a parcel that has added to the Town tax revenues.

I. Police/ Fire/ Ambulance Service

In addition to the existing Security staff at U of R, the University has undertaken a program to add sworn Peace Officers at the campus. Trainees underwent training, and 24 began work in October 2013. An additional 21-26 officers will complete the training and will be sworn in and ready for work in 2014.

The anticipated make-up of the staffing is as follows:

	Sworn Officers				
	Peace Officers	Supervisors	Crime prevention specialist	Patrol Manager	Investigator
2013	16	5	1	1	1
2014	16-21	5			
Totals	32-37	10	1	1	1

Below is a brief summary comparison of the potential impacts of the DGEIS Concept Plan as compared to the current Master Plan Concept plan.

DGEIS Concept Plan	S-DGEIS / Master Plan
The number of service calls placed by the South Campus property is relatively modest. The University will work with the Town and its service providers to determine what resources will be needed to adequately provide these services without detriment to the rest of the Brighton Community.	<p>Though there is a potential for a higher number of calls with the Master Plan shift to more residential land use, the potential for increased calls will also be offset by overall reduction in square footage at full build-out. The introduction of University sworn Peace Officers will greatly reduce the potential impact to service calls on the Town Police force. The University will continue to work with the Town and its service providers to determine resources needs for the South Campus.</p> <p>Response levels will vary with building type and program and potential impacts reviewed at the time of individual project approvals.</p>

Mitigation

Police/Fire/Ambulance Service

The introduction of up to 50 University sworn Peace Officers will greatly reduce the potential impact to service calls on the Town Police force. Currently 24 Peace Officers are active, with up to an additional 26 scheduled to complete training and be sworn in during 2014.

The University will continue to work with the Town and its service providers to determine resource needs for the South Campus.

Response levels will vary with building type and program and potential impacts reviewed at the time of individual project approvals

J. Recreational Opportunities

This section of the DGEIS remains primarily unchanged, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section VI. J. Page 92.

However, the Master Plan concept site plan has been updated to incorporate preservation of old growth habitats. Avoidance of future growth in those areas, and maintaining the woodlots and adjacent wetland areas provides further long term preservation of significant natural resources and habitats.

Mitigation

While formalized trails are not being proposed through the woodlot areas in order to protect wetland areas, the areas of old growth habitat, and considerable areas of woodlot will be preserved to maintain natural habitat for the benefit and enjoyment of those living and working on the South Campus site. As mentioned above, a connection to the Lehigh Valley Trail will be available at East River Road, which will allow direct access to the surrounding trail network. As buildings along Murlin Drive are constructed, a sidewalk and/or shared use trail will also be developed to ensure that the South Campus development fully accommodates pedestrians and bicyclists. Doing so will reduce the dependence on motor vehicles for students who may prefer to bike to the Medical Campus and River Campus via the Kendrick Road Bridge.

K. Growth Inducement Aspects

This section of the DGEIS remains unchanged, and is therefore incorporated by reference. Please refer to the November 2005 DGEIS Section VI. K. Page 92.

No spin-off development is anticipated from the facility improvements and further development of the South Campus. The adjacent areas in the vicinity of South Campus are already served by water and sanitary services, and upgrades to the

utility services needed to fully develop the Master Plan are minimal. Much of the area adjacent to the site is either already developed or designated parkland. Therefore, the Master Plan development is not expected to trigger additional growth in the area.

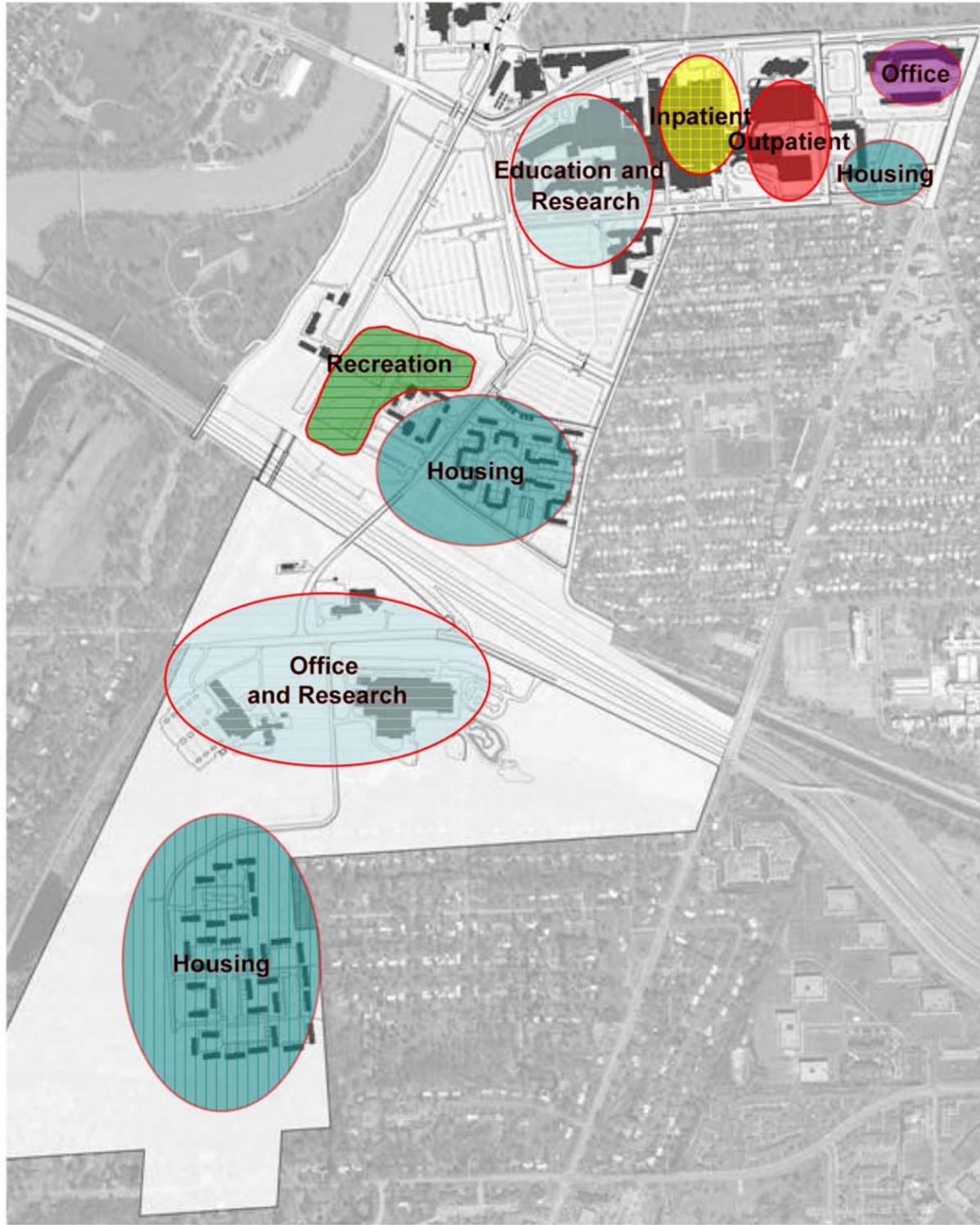
Mitigation

No spin-off development is anticipated from the facility improvements and further development of the South Campus. The adjacent areas in the vicinity of South Campus are already served by water and sanitary services, and upgrades to the utility services needed to fully develop the Master Plan are minimal. Much of the area adjacent to the site is either already developed or designated parkland. Therefore, the Master Plan development is not expected to trigger additional growth in the area.

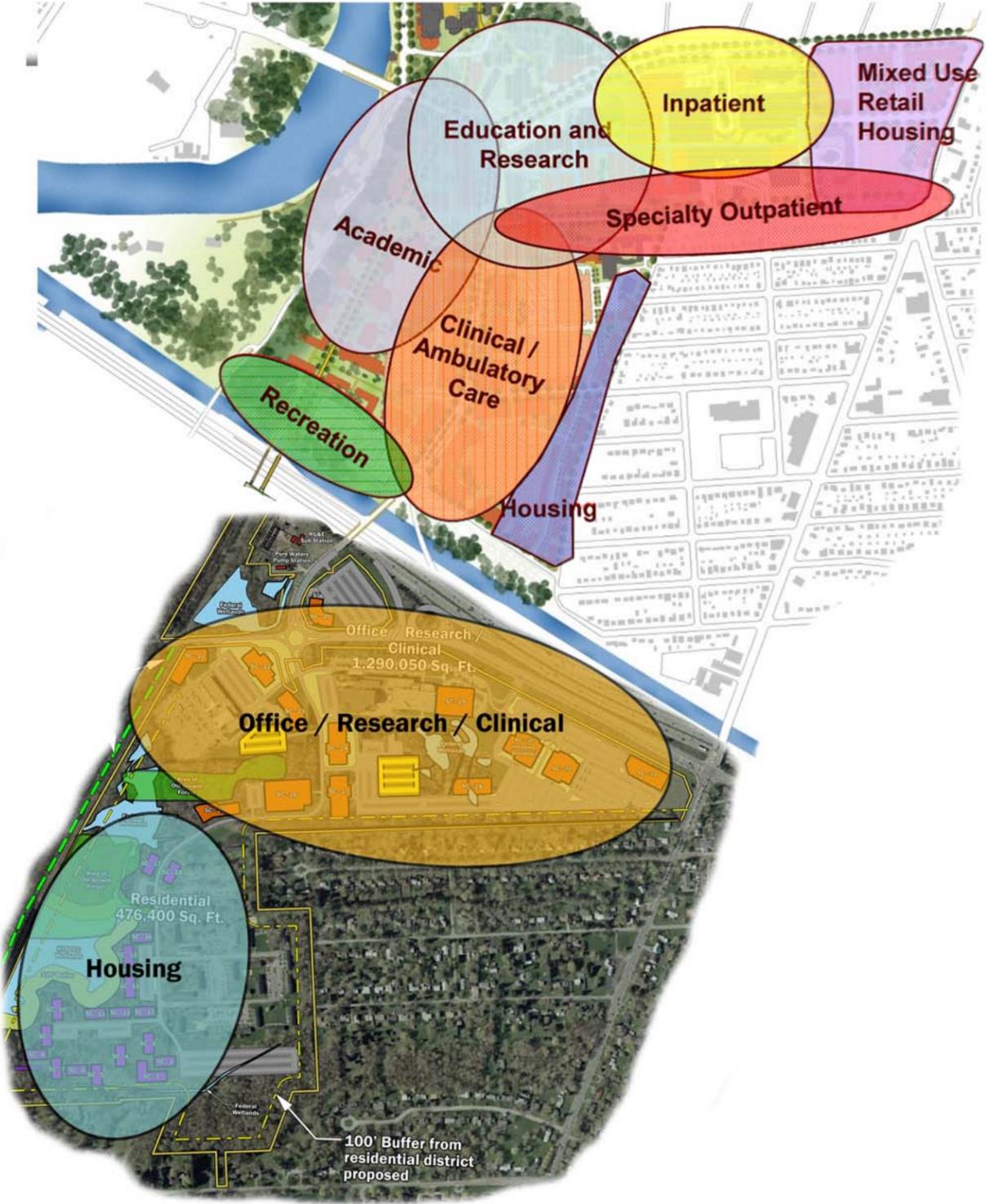


UNIVERSITY OF ROCHESTER SOUTH CAMPUS

Existing Land Uses



Campus Wide Existing Land Uses



Campus Wide Proposed Land Uses



UNIVERSITY OF ROCHESTER SOUTH CAMPUS

Campus Wide Existing and Proposed Land Uses



IPD Application Materials - DGEIS

Existing Residential:	338,600 GSF
Existing Office/Research:	332,671 GSF
Proposed Office/Research/Clinical:	1,972,207 GSF
Overall Total At Full Build:	2,643,478 GSF



Current Master Plan for South Campus

Existing Residential:	338,600 GSF
Existing Office/Research:	430,762 GSF
Proposed Residential:	476,400 GSF
Proposed Office/Research/Clinical:	1,290,050 GSF
Total New Proposed:	1,766,450 GSF
Overall Total At Full Build:	2,535,812 GSF



UNIVERSITY OF ROCHESTER SOUTH CAMPUS

Proposed Development Comparison - DGEIS to SDGEIS

Residential: (4 floor buildings)

- SC-1: 24,000 gsf
- SC-2: 24,000 gsf
- SC-3: 46,400 gsf
- SC-4: 24,000gsf
- SC-5: 24,000 gsf
- SC-9: 24,000 gsf
- SC-7: 24,000 gsf
- SC-8: 24,000 gsf
- SC-9: 24,000 gsf
- SC-10: 46,000 gsf
- SC-11: 24,000 gsf
- SC-12: 24,000 gsf
- SC-13: 24,000 gsf
- SC-14: 24,000 gsf
- SC-15: 24,000 gsf
- SC-16: 24,000 gsf
- SC-18: 24,000 gsf
- SC-19: 24,000 gsf
- Subtotal: 476,400 gsf**

Office/Research/Clinical: (1-5 floor buildings)

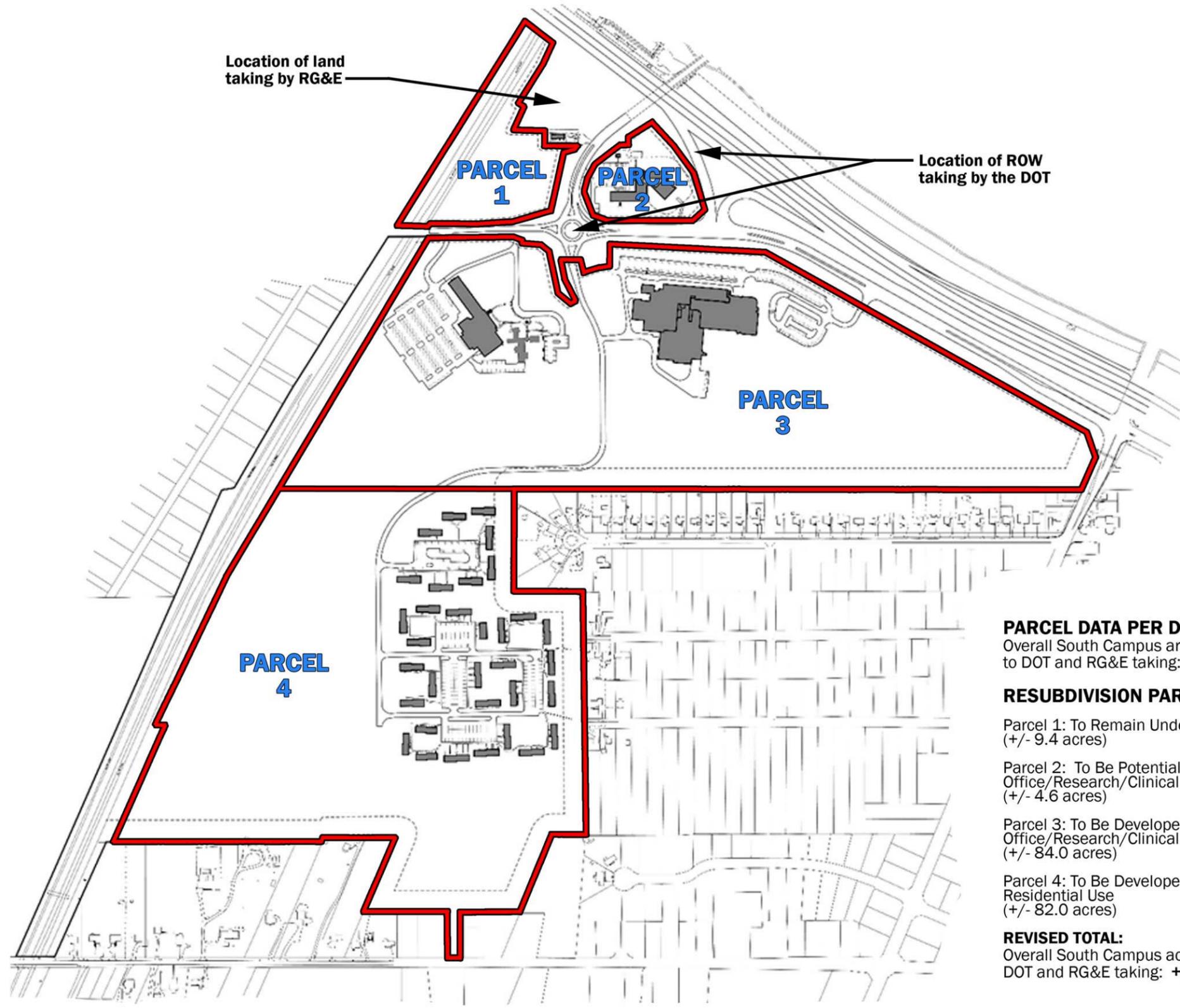
- SC-20: 125,000 gsf
- SC-21: 100,000 gsf
- SC-22: 125,000 gsf
- SC-23: 100,000gsf
- SC-24: 100,000 gsf
- SC-25: 100,000 gsf
- SC-26: 100,000 gsf
- SC-27: 100,000 gsf
- SC-28: 100,000 gsf
- SC-29: 20,000 gsf
- SC-30: 140,050 gsf
- SC-31: 105,000 gsf
- SC-32: 75,000 gsf
- Subtotal: 1,290,050 gsf**

- Institutional Buildings (SC-20 - SC-32)
- Parking Structures (multi level)
- Residential Buildings (SC-1 - SC-18)



UNIVERSITY OF ROCHESTER SOUTH CAMPUS

Master Plan with Building Square Footages



PARCEL DATA PER DGEIS:
 Overall South Campus area prior to DOT and RG&E taking: +/- **188 acres**

RESUBDIVISION PARCEL DATA:

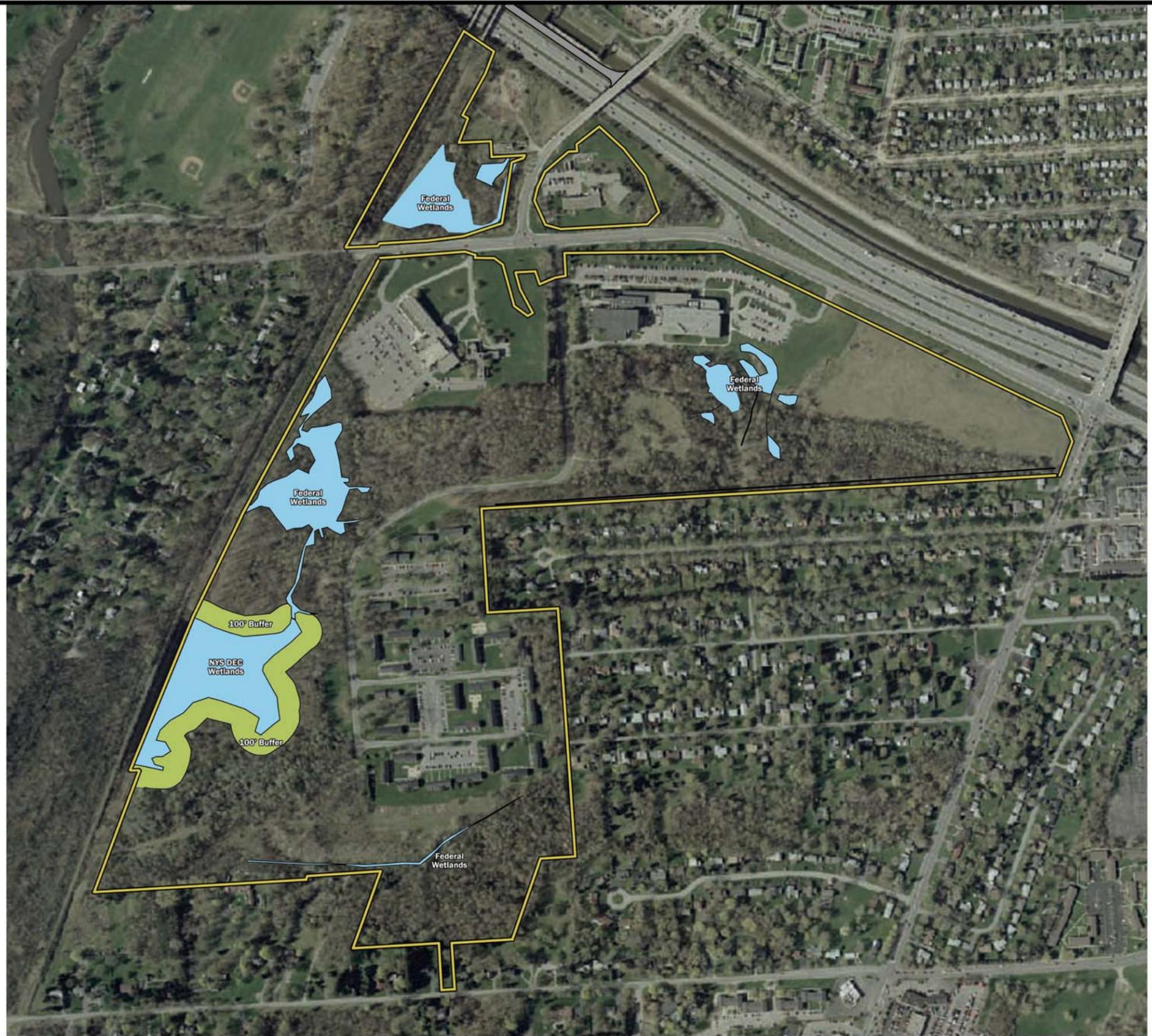
- Parcel 1: To Remain Undeveloped (+/- 9.4 acres)
- Parcel 2: To Be Potentially Redeveloped Office/Research/Clinical Use (+/- 4.6 acres)
- Parcel 3: To Be Developed Office/Research/Clinical Use (+/- 84.0 acres)
- Parcel 4: To Be Developed Residential Use (+/- 82.0 acres)

REVISED TOTAL:
 Overall South Campus acreage post DOT and RG&E taking: +/- **180 acres**



UNIVERSITY OF ROCHESTER SOUTH CAMPUS

IPD Land Areas



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Updated Mapping of Site Wetlands





Woodlot EPOD:
Area = 96.6 Acres

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Woodlot EPOD and Old Growth Forest Areas





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 Location of Significant Trees Within Area of Development



UNIVERSITY OF ROCHESTER SOUTH CAMPUS
 Master Plan with Significant Tree Locations Indicated





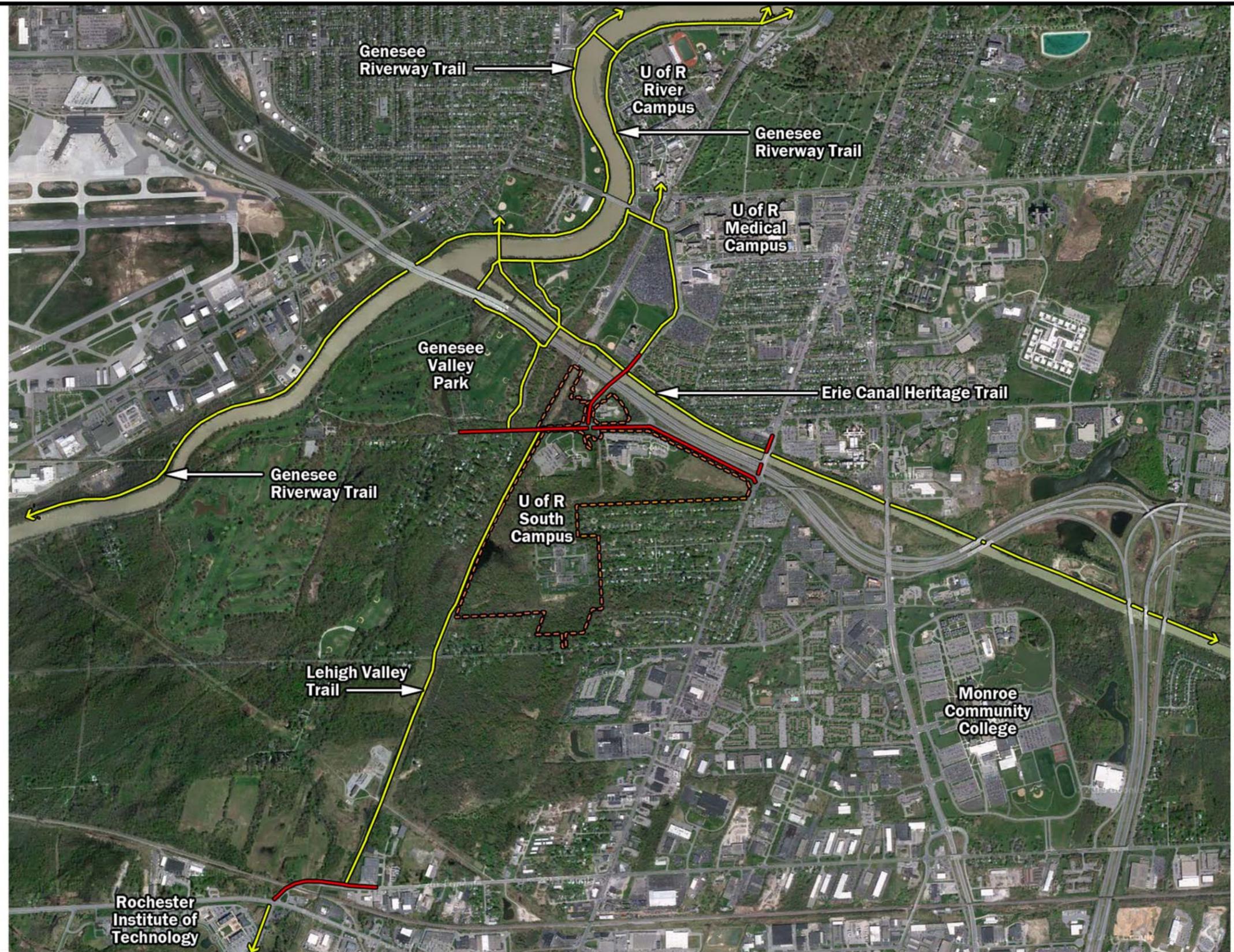
Woodlot EPOD:
 Area = 96.6 Acres

**Developable Area
 Within Woodlot EPOD =**
 41.3 Acres (+/-43%)

UNIVERSITY OF ROCHESTER SOUTH CAMPUS

Developable Area within Woodlot EPOD





UNIVERSITY OF ROCHESTER SOUTH CAMPUS

Existing Regional Trail/Sidewalk Connections



UNIVERSITY OF ROCHESTER SOUTH CAMPUS

Full Build Internal Trail/Sidewalk Network

APPENDIX A

Drainage Report & Supporting Data

Drainage Report

University of Rochester
IPD Rezoning

Crittenden Road to East River Road
Town of Brighton
Monroe County
New York

1. Introduction

The following drainage report addresses the existing site stormwater runoff conditions, as well as probable stormwater mitigation measures and pollution prevention devices that would be required for future development within the proposed rezoning and Institutional Planned Development (IPD) of the University of Rochester's South Campus, based on probable use and allowable zoning for compliance with the Town of Brighton Code, the Irondequoit Creek Watershed Collaborative, and the Phase II requirements of the New York State Pollutant Elimination System (SPDES) General Permit GP-0-10-001 for stormwater discharges associated with construction activity. The proposed area for rezoning is located between Crittenden Road and East River Road from the Lehigh Valley Rail Trail to West Henrietta Road in the Town of Brighton, Monroe County, New York. Here-in referred to as the IPD Rezoning Action. Refer to Figure A of Appendix A for a map of the IPD Rezone area.

This report is intended to describe the existing land use, topography, watercourses, drainage patterns, existing drainage problems, and all areas draining through the proposed rezoning area. Additionally, this document is intended to assess future post-development drainage conditions, storm water runoff requirements, and to provide recommendations for alleviating any existing drainage problems. The report describes potential development, possible site limitations, potential impacts to natural resources, runoff quantities, and effects on receiving waters. Potential storm water management facilities are identified, along with an overall approach for design.

This Plan was created with the guidance of the New York State Stormwater Management Design Manual (NYS SMDM) dated 2010 and the New York State Standards and Specifications for Erosion and Sedimentation Control, and documents stormwater mitigation measures to comply with the requirements of GP-0-10-001.

2. Background Information

2a. Owner Information

The University of Rochester
612 Wilson Boulevard
Rochester, NY 14620

2b. Mapping

Figures A, B, C, D, E & F of Appendix A provide information to locate the action site, important physical features, and other information relevant to the action. Figure A is a map of the IPD District. Figure B-1 is an existing conditions map which includes the boundaries of each subarea. Figure B-2 is a plan that shows modifications that can be made to the existing drainage system to improve flooding conditions to the properties on Crittenden Road. Figure C is a map of the proposed conditions entire action site, which includes the major watercourses and the boundaries of each designated drainage subarea. Figures D, E & F show the stormwater management practices proposed in each of the subareas.

2c. Project Description

The University of Rochester (the "University") owns hundreds of acres in the Town of Brighton and City of Rochester and is a leading employer in Monroe County. Among the property owned is what is called "South Campus", which totals 180+/- acres. This property is fully in the Town of Brighton and is bounded on the north by Interstate Route 390, on the west by the former Lehigh Railroad right of way, on the east by West Henrietta Road, and on the south by Southland Drive

and Crittenden Road. The property also includes the Lilac Park Subdivision located to the south of Crittenden Road and east of the Lehigh Railroad ROW. Total University of Rochester land holdings in the Town of Brighton are 255 +/- acres. Of this 255 +/- acres, approximately 42 acres lie south of Crittenden Road as either former railroad right of way or as part of the former Lilac Park Subdivision. Additionally, the University (since the start of this rezoning proceeding) has sold approximately 25 acres to the Town of Brighton, which is currently used as the Lehigh Valley Recreational Trail.

The proposal by the University consists of the rezoning (with incentive zoning treatment) of approximately 180± acres (3 parcels) of the South Campus property (the land to be rezoned is the "Rezone Property") from residential to Institutional Planned Development ("IPD") in the Town of Brighton, New York (the "Town").

At the request of the Town, a conceptual plan was developed indicating potential building layouts, densities, and uses. This conceptual plan was outlined in a Draft Generic Environmental Impact Statement (DGEIS). The Town determined that enough changes had taken place to warrant the preparation of a Supplemental Draft Generic Environmental Impact Statement (S-DGEIS) dated March 2013. A summary of the changes includes:

- Removal of approximately 6 acres of U of R lands from the proposed IPD District developable land because of acquisition of some acreage by the NYSDOT to make way for I-390 corridor improvements and the use of other acreage for an RG&E Substation.
- Commencement of construction of new I-390 on ramps by NYSDOT.
- Preparation of a revised Concept Master Plan for South Campus
- A clinical building in the South Campus – 140,000 GSF (max.) known as the "Imaging Building" to be built as soon as possible. (This would be the first project for the South Campus comprising this IPD District.)
- ROW to NYSDOT for Kendrick Road traffic circle and Merlin Drive re-alignment.

The development area consists of both new development and redevelopment areas. Redevelopment areas constitute any areas that had existing impervious surfaces which will be developed to be either an impervious or pervious surface or existing pervious surfaces which will remain pervious. Redevelopment areas fall under the NYSDEC Stormwater Management Design Manual (SMDM) Chapter 9 Redevelopment regulations. These requirements call for the post-developed runoff rate from the 1, 10 & 100-yr storm frequencies to be attenuated to existing conditions. Water quality volume is a certain volume representing 90% of the average annual runoff volume, which typically contains the most pollutants. 25% of the water quality volume calculated for the redevelopment area is required to be provided in the proposed development and with a standard practice. A standard practice is one that provides 80% TSS removal and 40% phosphorus removal. These practices are listed in Chapter 6 of the SMDM. Runoff reduction volume (RRv) is not required for redevelopment areas. New development areas constitute any areas that had existing pervious surfaces which will be developed to an impervious surface. New development areas fall under the SMDM Chap. 4 Unified Sizing Criteria, Chap. 5 Green Design and Chap. 6 Performance Criteria regulations. These requirements call for the post developed runoff volume from the 1-year storm event to be detailed over 24 hours to provide downstream channel protection volume and the 10 & 100-yr storm frequencies to be attenuated to existing conditions. The Town of Brighton further requires attenuation of the 100-yr post-developed runoff rate to the 25-yr pre-developed rate and so forth for all lesser events. This criteria applies to both new development and redevelopment areas. New development also requires a portion of the WQv to be provided through Runoff Reduction Volume (RRv) practices. RRv practices are listed in Chap. 5 and include a combination of planning practices and infrastructure practices which reduce runoff volume by reducing generation of the volume, redirecting the volume to alternative sources or promoting groundwater recharge of the volume. Each of these practices provides a certain amount of RRv credit. A minimum RRv requirement is required which is dependent on the infiltration capacity of the soils. The goal is to provide the WQv completely through RRv practices. This goal can be difficult to achieve particularly in areas

with poorly infiltrating soils and high ground water tables. Figures D-F in Appendix A delineates impervious areas that are considered redevelopment. The remaining impervious areas represent new development.

2d. Site Limitations

Slope – The topography of the action site is generally flat. There are some small, local variations in slope. The flat to varying topography of the site presents few limitations for potential development. There will be areas of the site that will require cut and fill practices and re-grading of the existing topography for any potential future development.

Soil Erodibility – There is potential for erosion both during and after any future construction. Most of the soil types on site have a moderate potential for runoff due to slow infiltration rates. A few small areas consist of soils with high runoff potential. These factors will not limit future development, provided erosion control measures, both temporary and permanent, are employed to ensure that erosion does not occur more frequently than under existing conditions.

Depth to Bedrock – According to the Monroe County Soils Survey, the depth to bedrock is greater than 4 – 6 feet. The bedrock is not anticipated to limit any future site development however it may restrict the type of stormwater management practice that can be employed. Refer to the soil survey reference data in Appendix B.

Water Table – According to the Monroe County Soils Survey, the depth to the seasonal high water table throughout the majority of the site is greater than 18 to 24 inches. There are also several regions where it can rise to within 6 to 12 inches of the surface. The seasonal water table is not anticipated to limit any future development; however it may restrict the type of stormwater management practice that can be employed. Future construction activities may require dewatering procedures, such as pumping, during excavations. In areas of poor drainage, the water table can actually rise to or above the surface level. These areas are typically located in wetland areas and will severely limit or preclude development. Refer to the soil survey reference data in Appendix B.

Infiltration Capacity – The soils on the majority of the site have a slow infiltration rate when thoroughly wetted. They consist chiefly of soils with a layer that impedes downward movement of water or soils with a moderately fine texture. There are a few areas that consist of soils with somewhat better infiltration, as well as few areas with much worse infiltration capacity. The areas with the worst infiltration typically consist of clay soils with a high swelling potential or soils with a permanent high water table. The infiltration capacity and permeability of the soils are also much less around the wetlands. For the majority of the action site, however, infiltration capacity will not limit future development however it may restrict the type of stormwater management practice that can be employed. Information is based on the Monroe County Soils Survey. Refer to the soil survey reference data in Appendix B.

2e. Potential Impacts to Natural Resources

Erosion, flooding and water quality concerns are the three main ways that storm water from this project could potentially impact natural resources. The stormwater management facilities and erosion control measures proposed for the site will mitigate these concerns. Potential impacts to specific natural resources are discussed below.

Receiving Waters

The following waters receive runoff from the project:

- Red Creek
- Tributaries to Red Creek
- Furlong Creek
- Erie Canal
- Wetlands

The potential development, as shown, will not have a negative effect on the receiving waters. The rate of runoff reaching these waters will not increase; any potential future development area will have post-development runoff rates less than or equal to existing peak run off rates. Furthermore, the proposed plan will redirect runoff from downstream areas with historical flooding problems to the Erie Canal. Each of the natural receiving waters will have a significant reduction in both runoff rate and quantity with the post-developed improvements. Additional mitigation measures have been identified separate from the proposed re-zone development which will provide relief to the flooding the properties along Furlong Creek experience. The quality of the runoff leaving the site will be improved as a result of the proposed stormwater management practices which will provide pollutant removal. The proposed stormwater management facilities meet the design standards of the NYS Stormwater Management Design Manual (NYSSMDM) which; for new development, require runoff to be captured, treated, and, to the extent possible, recharged to the groundwater as close as possible to the source of generation. Redevelopment areas will also receive water quality treatment. Temporary erosion control devices will be put in place during construction to minimize any pollutants from potentially reaching the downstream waters.

Green Space

The existing site is predominantly undeveloped, with a relatively small amount of existing development consisting of university buildings. The undeveloped area to the south of Crittenden Road to be deeded to the Town of Brighton (Lilac Park Subdivision) covers about 42 acres. This leaves approximately 180 acres left to the University of Rochester to be Institutional Planned Development. Refer to Figure B of Appendix A. Of the 180 acres, the potential development will include about 112 acres (including existing areas to remain). Currently about 74% of the part of the action site to remain U of R property is green space. The proposed development will reduce the amount of green space and open space by approximately 13%, leaving a remaining 61% undeveloped.

State & Federal Wetlands

A wetland delineation report for this site was originally prepared by Environmental Resources. On January 6, 2006, Environmental Resources and NYSDEC revisited the site to update this report. During this visit they determined that one of the wetlands on the property (referred to as Wetland G) was found to be contiguous and therefore considered a state jurisdictional wetland. Refer to the letter prepared by the NYSDEC titled "Review of Wetland Delineation" in Appendix C for details. The wetlands were re-delineated in October 2012 and found to be very similar in size; several new 'pockets' and a linear ditch area were flagged and surveyed. The updated development plan reflects the updates. The wetland areas mapping has been updated once again with a more current wetland delineation. The S-DGEIS contains the data from this updated wetland investigation and delineation, which was completed in the Fall of 2013. The Master Plan reflects changes to the wetlands boundaries, and the 100' buffer around the NYSDEC regulated wetlands. Refer to Appendix C of the S-DGEIS for wetland documentation and mapping updates.

Floodplains

The Rezone Property is not located in the 100-yr floodplain as shown on the Federal Emergency Management Agency (FEMA) floodplain maps (Community – Panel No: 36055C0332G, Effective Date: August 28 2008). The Red Creek Floodplain extends to the western edge of the Lehigh Valley Trail approximately 500-ft north of Crittenden Road (approximately where Furlong Creek passes through a culvert beneath the Lehigh Valley Trail). There will be no future development within the floodplain boundaries. Refer to Appendix C for a copy of the FIRMette.

3. Existing Site Conditions

The general topography of the University of Rochester IPD Rezoning Action site is relatively flat. A series of shrub and forested wetland areas are located throughout the region and many small depressional points occur as well. There are several areas of poor drainage and standing water. Some minor topographic features include small, slightly elevated knobs and ridges that direct storm water runoff short distances into adjacent watercourses and depressional areas. The area to the south of Crittenden Road that is to be deeded to the Town of Brighton has a general slope to the north. The rest of the site, while also sloping generally to the north and west, has slopes directed in more various directions, though few are very steep.

3a. Existing Land Use

The University of Rochester IPD Rezoning Action area is predominantly vacant and undeveloped. However, there are areas of development such as the university apartment complex located in U of R Property 10, and various institutional and industrial buildings. There are two institutional buildings on the action site; one is located on the west side of Merlin Drive and one on the right side. There are two industrial buildings on the site; one is a nuclear research facility and the other is a Monroe County Pure Waters sanitary pump station. These buildings are located on the properties in the northwest and north east quadrant of the East River Road and Merline Drive intersection. The area south of Crittenden Road, the Lilac Subdivision, is also vacant and undeveloped.

3b. Existing Drainage

The Rezone Property study area was divided into 5 separate drainage areas (subareas), as shown on Figure B to determine the existing drainage patterns. Subarea 1 consists of 44.98-acres located in the northwest portion of the Rezone Property, Subarea 2 consists of 66.0-acres located in the northeast portion of the Rezone Property, Subarea 3 consists of 39.08-acres located in the middle portion of the Rezone Property including the Whipple Park Apartments, Subarea 4 consists of 31.01-acres located in the southern portion of the Rezone Property, north of Crittenden Road, and Subarea 5 consists of 41.5-acres located south of Crittenden Road (Lilac Park Subdivision). Within the boundaries of the Rezone Property there are five primary watercourses / drainage ways. The watercourses serve as receiving locations for storm water runoff from the adjacent topography and direct the discharge to the Erie Canal or ultimately to Red Creek.

The drainage from Subarea #2 discharges to the Erie Canal which is not considered a natural watercourse. Subarea #2 has been divided into four sub-subareas to account for the four separate systems this drainage area uses to reach the Canal. The first Subarea #2A consists of the western portion of Merlin Drive and some of the existing buildings and parking areas on the east side of Merlin Drive. This area sheet drains or is directly discharged to the existing detention pond located in the south-east quadrant of the East River Road and Merlin Drive intersection.

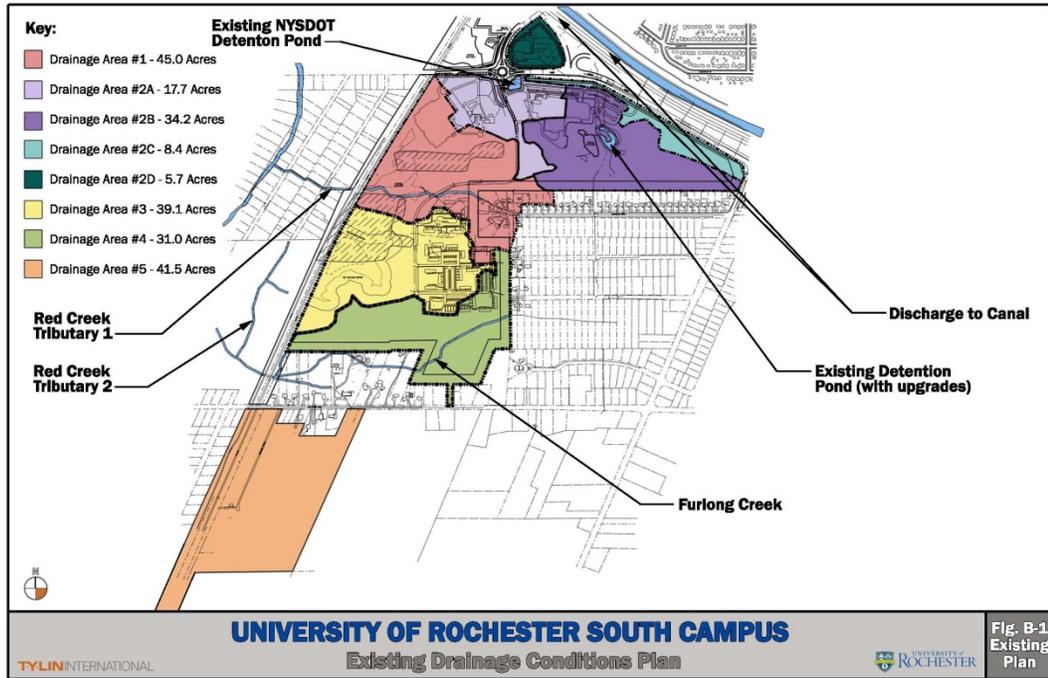
This detention pond was recently constructed as part of the NYSDOT I-390 and E River Road improvements. The pond outlets via an outlet structure directly to the Erie Canal. The second subarea #2B primarily consists of the eastern portion of Subarea #2 from Merlin Drive. This area sheet drains or is directly discharged to an existing detention pond located east of the Laser Lab. The detention pond discharges via a large outlet structure and storm sewer to the Erie Canal. There is an off-site area that drains through this subarea. It consists of approximately 44-acres and includes the residential area to the east of the Whipple Park Apartments and south of the Laser Lab/COI, containing the residences located along Southland Drive, Sylvia Road, and Doncaster Road. The storm water runoff is collected in a closed conduit drainage system that conveys the storm water to the existing detention pond. Subarea #2C receives sheet drainage from eastern portions of Subarea #2 that do not discharge to the existing detention pond. This consists mainly of lawn areas south of East River Road. The fourth sub-area is Subarea #2D which consists of the parcel north of East River Road, a University building. This area is collected in a closed conduit storm sewer system and discharged into a storm sewer system in Kendrick Road. This system outlets directly into the Erie Canal. Refer to Figure B-2 in Appendix A.

The first natural watercourse collects drainage from Subarea #1 and is located on the west side of the South Campus. The upstream end of the watercourse is located immediately north of the Whipple Park Apartments and flows from east to west. The discharge from this watercourse is directed to Red Creek. It is located primarily within a forested wetland area. Storm water runoff is received predominantly from regions to the north and east of the watercourse. The topography to the north slopes in the southwest direction. The slope on the east side directs runoff approximately due west into the watercourse. A minor drainage-way, which flows southwardly with storm water runoff collected from the immediate surrounding topography, merges into the main watercourse from wooded wetlands to the north. Beyond the western boundary of the Rezone Property, the watercourse continues to direct storm water west through a small section of residential subdivision, and discharges to Red Creek. Refer to Figure B-2 in Appendix A.

The second natural watercourse within the Rezone Property collects drainage from Subarea 3 and is located in the south-west portion of the South Campus. This area generally flows east to west towards a large wetland area herein referred to as the 'South Wetlands'. No outlet for this watercourse could be located. A culvert is reputed to direct runoff from the wetlands under the Lehigh Valley Trail to a drainage ditch that runs south to Furlong Creek west of the trail. The culvert could not be found by multiple parties and is believed to be completely plugged and/or buried. The bottom of this subarea/watercourse contains a large area of standing water and storage potential. The standing water exhibits stagnant behavior and discharges through slow ground infiltration to the west and evapotranspiration. A natural ridge separates the south wetland drainage area from the Furlong Creek drainage area to the south. A drainage swale runs along the east side of the Lehigh Valley trail berm connecting the Furlong Creek and South wetland drainage areas. The swale has a natural high point at the ridge and directs runoff in opposing directions from this point. Large storm events that exceed the capacity of the storage area surmount the ridge point in the swale and flow south to the Furlong Creek drainage area. Refer to Figure B-2 in Appendix A.

The third natural watercourse collects drainage from Subarea #4 & #5 and discharges to Furlong Creek, a tributary of Red Creek. This area consists of the southern portion of the Rezone Area, north of the residential properties on Crittenden Road. Furlong creek crosses the Lehigh Valley Trail before discharging to Red Creek. The topography on the southeast edge of this section of the stream slopes to the west, while slopes on the northwest side of this section incline in a southeastern direction towards Furlong Creek. There is a second watercourse from the northwest that confluent with Furlong Creek. Runoff entering the watercourse at the forked section predominantly originates from regions to the north with slopes directed southeasterly. Refer to Figure 3.1 for a map of the drainage areas. This figure is also provided as B-2 in Appendix A.

Figure 3.1 – Existing Drainage Areas Map



Refer to Table 3.1 for a summary of the existing drainage areas and Appendix D for detailed calculations.

Table 3.1 – Existing Drainage Areas

Drainage Area	Area (acres)	Weighted CN*	Tc (hrs)
Subarea 1 Northern Red Creek Tributary	44.98	82	0.75
Subarea 2A Erie Canal via NYSDOT Detention Pond	17.71	86 to swale	0.5 to swale
Subarea 2B Erie Canal via Existing U of R Detention Pond	34.19 (onsite) 44.0 (offsite)	81.8 (onsite) 85 (offsite)	0.7 (onsite) 0.5 (offsite)
Subarea 2C Erie Canal via I-390 Storm Sewer System	8.38	80	0.2
Subarea 2D Erie Canal via Merlin Drive Storm Sewer	5.74	83.7	0.2
Subarea 3 Furlong Creek by South Wetland	39.1	86	0.3
Subarea 4 Furlong Creek	31.0	78	0.5
Subarea 5 Lilac Park Subdivision; drains to Furlong Creek	41.5	73	0.6

* The Curve Number (CN) shown is a weighted calculation based on percentages of undeveloped ground cover and impervious surfaces per subarea. Refer to Appendix D for the drainage computations.

3c. Existing Drainage Concerns

Residential properties located along the north side of Crittenden Road adjacent to the Lehigh Valley Trail berm experience significant and disruptive flooding in their rear yards. The flooding is from drainage in the Furlong Creek watershed. This watershed is restricted by a box culvert under the trail berm. Upstream of the culvert, the Furlong Creek flow area is not well defined into a channel until further upstream. The Town of Brighton commissioned the Townwide Drainage Study in 1978 that included Furlong Creek. This study identified the Furlong Creek watershed to be 0.42 square miles. Of this area, approximately 0.35 square miles is located on the east side of the Lehigh Valley Trail (trail) contributing to the flooding. 49% of this area is located on the U of R property however the majority of this area is undeveloped natural land cover. Natural land cover provides relief to flooding by slowing, intercepting and absorbing runoff via the dense vegetation. Only 1% of the 0.35 square mile drainage area is developed (impervious) area on the U of R property. Three amenities have been identified which will remove the U of R developed runoff contribution to the Furlong Creek watershed. Refer to section #9 for a detailed description of these amenities.

In the same area north of Crittenden Road, but west of the trail berm there is also some flooding problems by the residential properties on Norman and Helen Road. South of the residential area is a 100-year flood zone where ponding would be expected. A drainage ditch directs runoff south from the residential properties through the flood zone to Furlong Creek. Sheet drainage does not always reach the ditch and sometimes causes disruptive flooding to the residential properties.

3d. Soils

The natural soils occurring within the boundaries of the University of Rochester IPD Rezoning area consist of eleven different natural soil types, according to Monroe County Soil Survey information. Refer to the soil survey reference data in Appendix B. These soil types include soils from the Cosad, Colonie, Claverack, Elnora, Hilton, Cayuga, Lakemont, Odessa, Schoharie, and Collamer series. There is a twelfth, made soil type occurring in a thin strip on the northern boundary, under Interstate 390, along the Erie Canal waterfront.

Table 3.2 - Soils

Soil Type	Soil Name	Slope	Estimated Percent Coverage of Site	Approx. Location on Site (Property #'s)
Cu	Cosad loamy fine sand	-----	34%	1-9, 12
CoB	Colonie loamy fine sand	0% - 6%	24%	1-6, 9, 10, 12
CkA	Claverack loamy fine sand	0% - 2%	15%	3, 4, 9, 10, 12
EIA	Elnora loamy fine sand	0% - 2%	5%	9, 11, 12
HIA	Hilton loam	0% - 3%	4%	12
CeB	Cayuga silt loam	2% - 6%	3%	12
Le	Lakemont silt loam	-----	3%	4, 9-12
Oda	Odessa silt loam	0% - 2%	3%	4
Mb	Made land along canal	-----	3%	1, 2
SeA	Schoharie silt loam	0% - 2%	2%	1
CoC	Colonie loamy fine sand	6% - 12%	2%	12
CIA	Collamer silt loam	0% - 2%	1%	9, 11
SeB	Schoharie silt loam	2% - 6%	1%	12

4. Proposed Developed Conditions

The proposed action by the University of Rochester consists of the rezoning and incentive zoning of approximately 180 acres of land from residential to Institutional Planned Development (IPD). The area is bounded on the north by the intersection of the former Lehigh Railroad with Interstate Route 390, on the west by the former Lehigh Railroad (Lehigh Valley Trail) and, on the east by West Henrietta Road, and on the south by Southland Drive and Crittenden Road. The action area also includes the Lilac Park Subdivision located to the south of Crittenden Road and east of the Lehigh Railroad, which will be deeded to the Town of Brighton for open space as part of the proposed action.

The possible development of the Rezone Property (180 +/- acres) was sectioned into the three respective drainage areas where the development is proposed (Subarea #1, #2, & #3). New

development is not proposed in drainage areas #4 or #5. Estimated development per drainage area is shown in table 4.1.

Existing impervious surfaces cover about 16% of the Rezone Property north of Crittenden Road. The potential development, as shown, would increase this coverage by 22%. The storm water runoff from the potential developed areas will be directed towards local groundwater recharge and water quality practices and regional storm water ponds for runoff rate attenuation. The runoff from undeveloped portions of the site would follow existing drainage patterns into the primary watercourses that flow off-site to Red Creek. Refer Figure 4.1 for a map of the proposed drainage areas. Proposed drainage area maps are also provided as Figures C through F in Appendix A.

Figure 4.1 – Proposed Drainage Areas Map

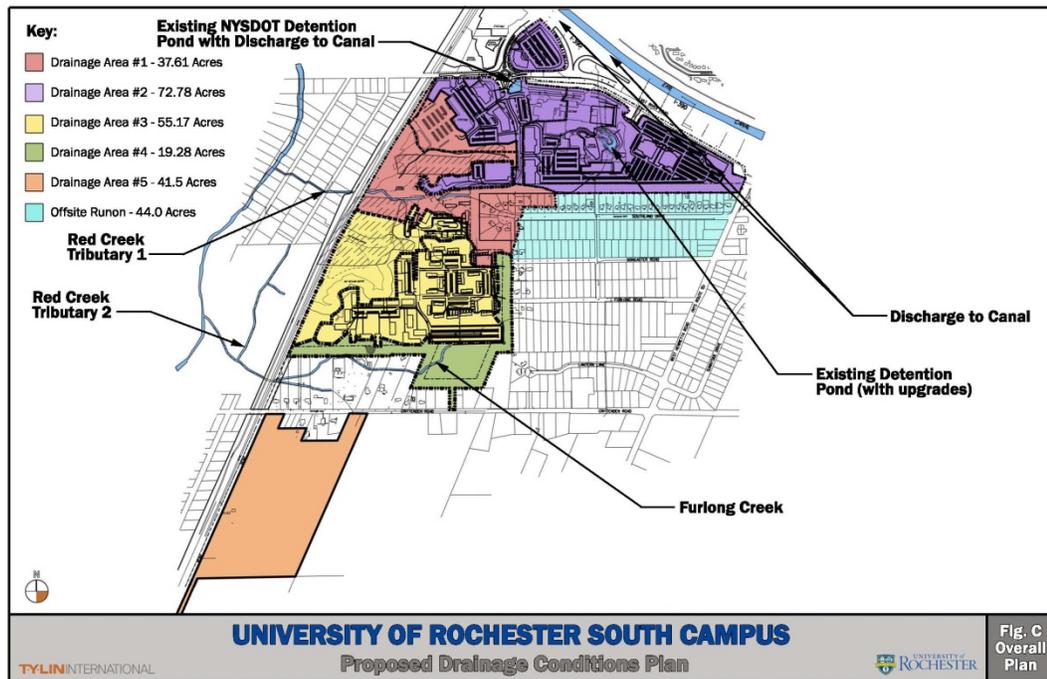


Table 4.1 – Proposed Drainage Areas

Drainage Area	Area (acres)	Weighted CN*	Tc (hrs)
Subarea 1 Northern Red Creek Tributary	6.35 (To Pond) 31.26 (Not to Pond)	90 (To Pond) 79 (Not to Pond)	0.3 (To Pond) 0.7 (Not to Pond)
Subarea 2A Erie Canal via NYSDOT Pond	13.9 (To Bioretention) 4.1 (Not to Bioretention) 4.3 (Subarea #2E)	91.5 (To Bioretention) 91.8 (Not to Bioretention) 91.4 (Subarea #2E)	0.2 (To Bioretention) 0.2 (Not to Bioretention) 0.25 (Subarea #2E)
Subarea 2B Erie Canal via Existing Detention Pond	30.9 (To Bioretention) 10.1 (Not to Bioretention) 44.0 (offsite)	93.2 (To Bioretention) 85.5 (Not to Bioretention) 85 (offsite)	0.5 (To Bioretention) 0.2 (Not to Bioretention) 0.5 (offsite)
Subarea 2C Erie Canal via I-390 Storm Sewer System	3.78	80	0.2
Subarea 2D Erie Canal via Merlin Drive storm sewer system	5.74	91.8	0.2
Subarea 3 Furlong Creek by South Wetlands	32.4 (To Bioretention) 22.8 (Not to Bioretention)	88.3 (To Bioretention) 87.6 (Not to Bioretention)	0.2 (To Bioretention) 0.2 (Not to Bioretention)
Subarea 4 Furlong Creek	19.3	77	0.5
Subarea 5 Lilac Park Subdivision; drains to Furlong Creek	41.5	73	0.6

* The Curve Number (CN) shown is a weighted calculation based on percentages of undeveloped ground cover and impervious surfaces per subarea. Refer to Appendix D for the drainage computations.

5. Stormwater Management Facilities

There are six main points of interest when planning for, and analyzing, the impacts of the proposed development. These six points are:

1. Pre- vs. Post-Development Runoff Rate
2. Post-Development Project Impacts Downstream
3. Pre- vs. Post-Development Runoff Volume
4. Post Development Project Impacts to Existing Flooding Problem Areas (Furlong Creek Study)
5. Pre- vs. Post-Development Groundwater Recharge
6. Pre- vs. Post-Development Pollutant discharge

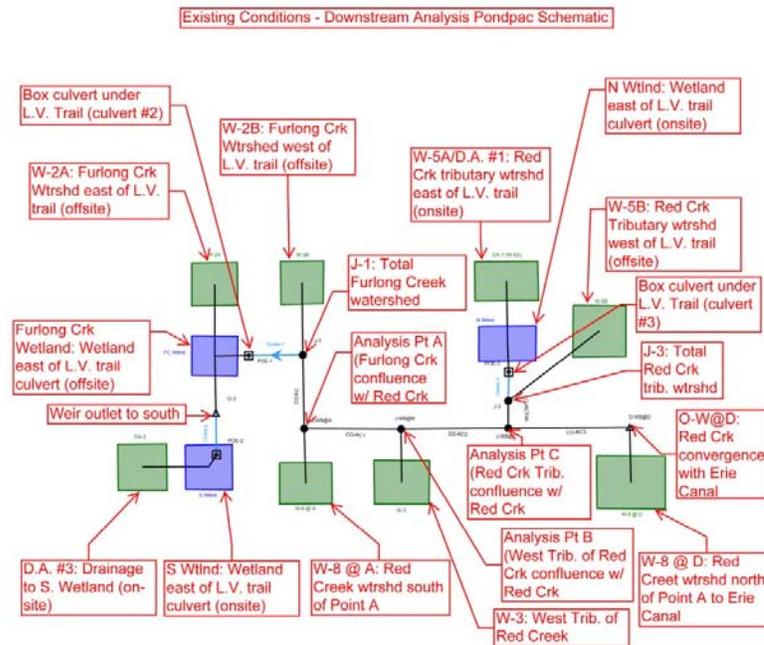
Each of these points are discussed in detail in the following sections.

6. Point #1: Pre-vs. Post-Development Runoff Rate

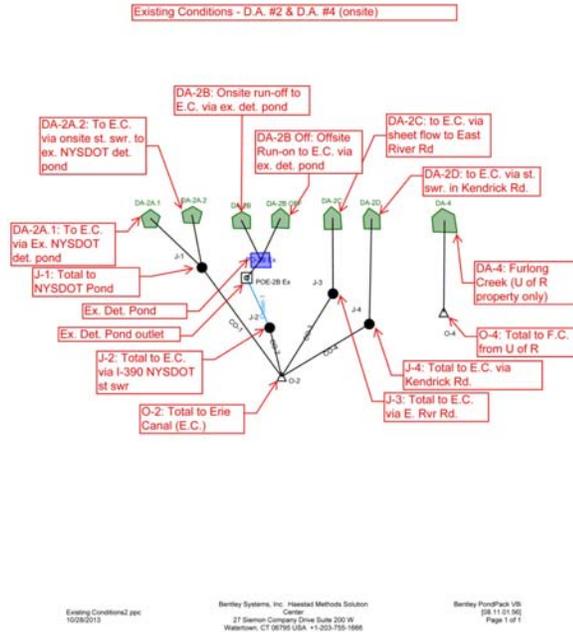
To meet the New York State stormwater design requirements for compliance with General Permit GP-0-10-001, the 1-yr post-developed run-off volume should be detained for 24-hrs and the 10-yr and 100-yr post-developed runoff should be attenuated to match existing conditions. The Town of Brighton also requires attenuation of the 100-yr post-development runoff rate to the 25-yr existing runoff rate, as well as controlling lesser events in the same manner.

The peak pre- and post-development run-off rate at the bottom of each subarea was calculated by using NRCS TR-55 methodology on Pond Pack, version 10.0, by Bentley Systems. The rainfall depths for the various storm events were taken from the "Rainfall List by County" in Appendix C. A type II synthetic rainfall distribution curve was used in the computations. The following schematics were used to model the watersheds.

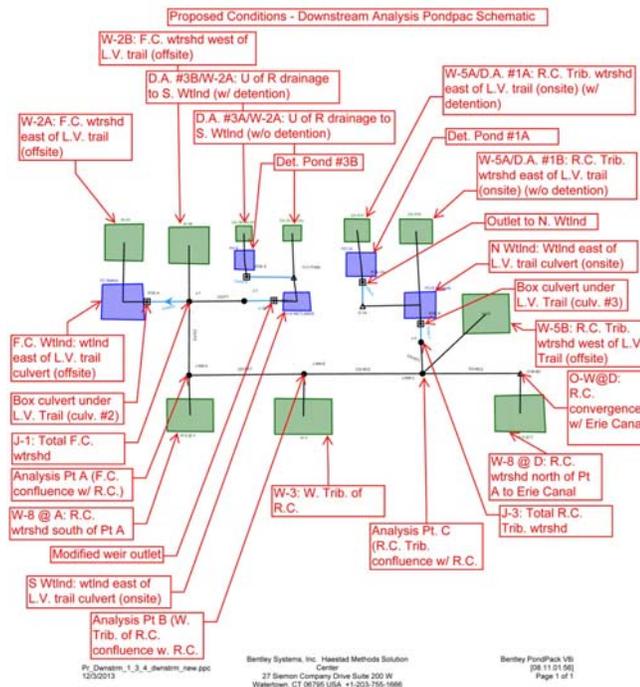
Existing Drainage Area #1 & #3



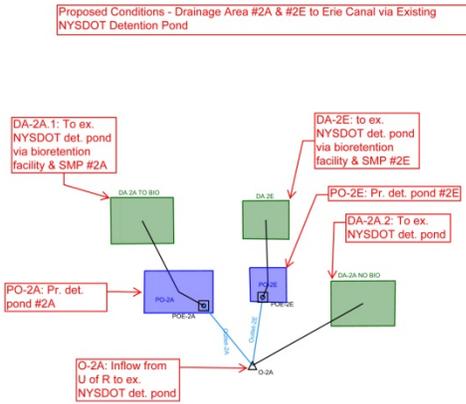
Existing Drainage Areas #2 and #4



Proposed Drainage Area #1 & #3



Proposed Drainage Area #2A & #2E to Existing NYSDOT Detention Pond

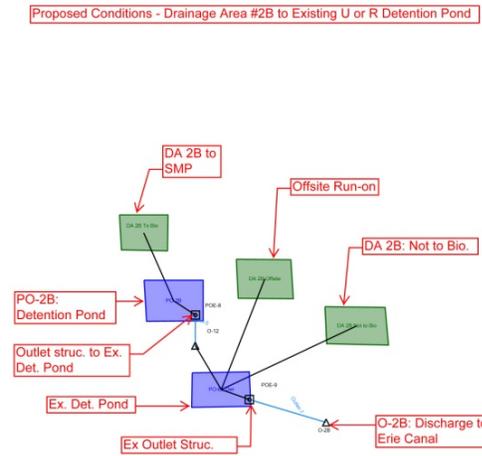


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Page 1 of 1

Proposed Drainage Area #2B to Existing U of R Detention Pond

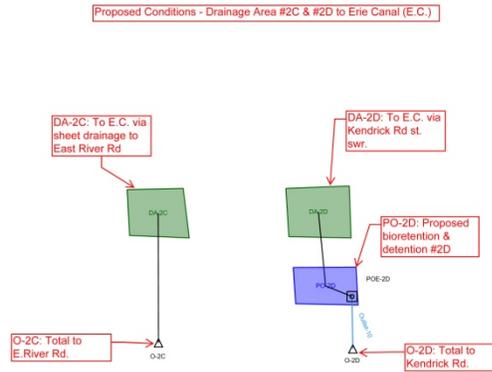


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Proposed Drainage Area #2C & #2D to Existing U of R Detention Pond



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Refer to Appendix D for the complete results of the calculations and analysis. Refer to tables 6.1 for a summary of the results. *These results show the runoff rates to the wetlands, where applicable, and do not take into account the restrictions from the wetlands outlets.*

Table 6.1 - Site Run-off

Drainage Area	Design Storm	Existing Run off (cfs)	Proposed Run off (cfs)
Subarea 1 Northern Red Creek Tributary <i>Ex: (DA-1/W5-A)</i> <i>Pr: (PO-N Wetlands IN)</i>	1-yr	21.4	11.8
	2-yr	27.9	15.7
	10-yr	53.8	32.6
	25-yr	66.4	41.0
	100-yr	87.1	54.7
Subarea 2A Erie Canal via NYSDOT Detention Pond <i>Ex: (J-2A)</i> <i>Pr: (O-2A)</i>	1-yr	15.5	14.7
	2-yr	19.4	17.7
	10-yr	34.6	29.7
	25-yr	41.7	35.1
	100-yr	53.2	43.3
Subarea 2B Erie Canal via Existing Detention Pond <i>Ex: (J-2B)</i> <i>Pr: (O-2B)</i>	1-yr	9.8	10.8
	2-yr	10.8	11.4
	10-yr	53.7	47.5
	25-yr	81.4	70.4
	100-yr	106.8	104.3
Subarea 2C Erie Canal via I-390 Storm Sewer System <i>Ex: (DA-2C)</i> <i>Pr: (O-2C)</i>	1-yr	7.6	3.4
	2-yr	10.0	4.5
	10-yr	19.7	8.9
	25-yr	24.4	11.0
	100-yr	32.0	14.5
Subarea 2D Erie Canal via Merlin Drive Sewer System <i>Ex: (DA-2D)</i> <i>Pr: (O-2D)</i>	1-yr	6.9	5.9
	2-yr	8.8	7.4
	10-yr	15.8	13.6
	25-yr	19.2	16.2
	100-yr	24.5	19.8
Subarea 3 Southern Red Creek Tributary <i>Ex: (DA-3)</i> <i>Pr: (PO-S Wetlands IN)</i>	1-yr	41.4	27.4
	2-yr	51.5	33.5
	10-yr	90.4	56.7
	25-yr	108.5	67.3
	100-yr	137.7	84.4
Subarea 4 Furlong Creek drainage area <i>Ex: (DA-4)</i> <i>Pr: (O-4)</i>	1-yr	14.2	8.0
	2-yr	19.4	11.2
	10-yr	41.1	24.3
	25-yr	51.7	30.8
	100-yr	69.5	41.7
Subarea 5 Lilac Park Subdivision; drains to Furlong Creek <i>(DA-5)</i>	1-yr	9.8	9.8
	2-yr	30.3	30.3
	10-yr	36.9	36.9
	25-yr	48.5	48.5
	100-yr	68.1	68.1
Total On Site & Off Site	1-yr	127	92
	2-yr	178	132
	10-yr	346	250
	25-yr	442	320
	100-yr	579	431

6a. Comparison of Pre- & Post-Development Runoff Rates

Overall the proposed stormwater management facilities will result in a decrease to the post-development runoff rate. Subareas #1 will reduce the 100-yr post-developed rate to the 25-yr pre-developed rate and the 25-yr post-developed rate to the 10-yr pre-developed rate. The 10-yr post-developed rate is not completely reduced to the 2-yr pre-developed rate but the post-developed 10-yr storm event is completely discharged through a 3-inch orifice. Rate attenuation is accomplished through stormwater management facilities which include ponds and underground storage chambers which discharge through outlet structures. Channel protection volume for the

1-year storm is applicable to developed area which discharge to natural watercourses and will be met by completely discharging this event through a 3-inch orifice. Subarea #2 discharges to a 5-th order waterbody thus attenuation is typically not required. Because this system discharges through the NYSDOT storm sewer system, post-development rates must be equal to existing conditions. For the larger storms this is achieved through ponds and underground storage. The NYSDOT storm sewer system is typically sized for a 10-year storm capacity. Storm events less than the 10-year have been attenuated to the pre-developed 10-year runoff rate. Subarea #3 is similar to Subarea #1 in that the higher storms attenuate rates to the subsequent lower storm and the 10-year storm is completely discharged through a 3-inch orifice. An interconnected above ground and below ground storage system is provided. The above ground portion allows this SMP to be regulated by a constant state pump and an outlet control structure. The outlet control will attenuate rates necessary to provide channel protection volume. Subarea #4 will reduce the post-developed runoff rate for each of the storm events by reducing the drainage area size. Development is not proposed within Subarea #4 or #5. Subarea #5 will not be affected by the proposed developments.

Stormwater management facilities designed to attenuate post-developed runoff rates have been located in subareas #1 through #3. The practices have been sized to comply with New York State Stormwater Management Design Manual's (NYS SMDM) pond requirements listed in Chapter 6.1, Refer to tables 6.3 through 6.9 for details of the proposed detention systems designs.

Table 6.3: Drainage Area #1A – Proposed Detention Pond #1A

Storm Event	Inflow (cfs)	Outflow (cfs)	Volume (Ac-ft)	Max Elev (ft)
1-yr	8.8	0.2	0.6	529.0
2-yr	10.5	0.2	0.6	529.1
10-yr	17.2	0.3	1.2	530.2
25-yr	20.2	0.3	1.4	530.4
100-yr	25.0	0.5	1.7	531.0

Outlet Structure: Composite Outlet Structure 1A

- Culvert: 20' – 30" diameter pipe (n=0.011) @ 0% slope
- Orifice: 3" diameter @ 528.0 ft
- Riser: 2.5'x2.5' box @ elev. 531.0 ft
- Weir: 50-ft long rectangular weir @ 531.0 ft
- Tailwater: Wetland #1

Table 6.4: Drainage Area #2A - Underground Storage #2A

Storm Event	Inflow (cfs)	Outflow (cfs)	Volume (Ac-ft)	Max Elev (ft)
1-yr	26.4	4.8	0.8	530.1
10-yr	31.3	6.5	0.9	530.3
25-yr	49.3	13.4	1.4	531.0
100-yr	57.4	16.2	1.6	531.3
	70.3	19.6	2.0	531.9

Outlet Structure: Composite Outlet Structure #2A

- Culvert: 114' – 24" diameter pipe (n=0.011) @ 0.4% slope
- Tailwater: Free Outfall

This drainage area discharges to a bioretention infiltration system prior to reaching the detention pond. To be conservative, it was assumed no runoff losses were obtained from infiltration and the entire drainage area runoff volume was routed to the detention system.

Table 6.5: Drainage Area #2B – Existing Detention Pond #2B

Storm Event	Inflow (cfs)	Outflow (cfs)	Volume (Ac-ft)	Max Elev (ft)
1-yr	72.2	10.8	3.1	532.3
2-yr	85.2	11.4	3.7	532.9
10-yr	124.4	47.5	4.8	533.8
25-yr	135.9	70.4	5.1	534.1
100-yr	149.4	104.3	5.8	534.7

Outlet Structure: Composite Outlet Structure 1

- Culvert: 50' – 36" diameter pipe (n=0.013) @ 3.5% slope
- Orifice: 2' x 0.5' (v:h) orifice @ 525.75 ft
- Riser: 4.2' x 4.2' box @ elev. 533.0 ft
- Tailwater: Free Outfall

Table 6.6: Drainage Area #2B – Proposed Detention Pond #2B

Storm Event	Inflow (cfs)	Outflow (cfs)	Volume (Ac-ft)	Max Elev (ft)
1-yr	39.7	33.0	0.7	532.3
2-yr	47.0	34.8	1.1	532.9
10-yr	73.6	33.6*	2.3	533.9
25-yr	85.6	30.6	2.7	534.2
100-yr	104.7	44.5	3.4	534.8

*Reverse flow due to tailwater condition

Outlet Structure: Composite Outlet Structure #2B

- Culvert: 150ft – 36" diameter pipe (n=0.011) @ 1.3% slope (upstream open end section)
- Culvert: 2-barrels 150ft – 36" diameter pipe (n=0.011) @ 0% slope (upstream connected to riser)
- Orifice: 10.5 sf @ elev. 531.0 ft
- Riser: (3) - 2.5' x 2.5' catch basins @ elev. 534.20 ft
- Weir: 300 ft rectangular weir @ elev. 534.2 ft
- Tailwater: Existing Detention Pond

This drainage area discharges to a bioretention infiltration system prior to reaching the detention pond. To be conservative, it was assumed no runoff losses were obtained from infiltration and the entire drainage area runoff volume was routed to the detention system.

Table 6.7: Drainage Area #2D - Underground Storage #2D

Storm Event	Inflow (cfs)	Outflow (cfs)	Volume (Ac-ft)	Max Elev (ft)
1-yr	11.0	5.9	0.2	524.8
2-yr	13.0	7.4	0.3	524.9
10-yr	20.4	13.6	0.4	525.5
25-yr	23.8	16.2	0.4	525.8
100-yr	29.2	19.8	0.5	526.2

Outlet Structure: Composite Outlet Structure #2

- Culvert: 20 ft – 24" diameter pipe (n=0.011) @ 0.5% slope
- Tailwater: Free Outfall

This drainage area discharges to a bioretention infiltration system prior to reaching the detention pond. To be conservative, it was assumed no runoff losses were obtained from infiltration and the entire drainage area runoff volume was routed to the detention system.

Table 6.8: Drainage Area #2E - Underground Storage #2E

Storm Event	Inflow (cfs)	Outflow (cfs)	Volume (Ac-ft)	Max Elev (ft)
1-yr	7.0	4.7	0.1	531.0
2-yr	8.3	5.2	0.1	531.5
10-yr	13.4	6.6	0.2	533.2
25-yr	15.6	7.2	0.2	534.1
100-yr	19.3	8.3	0.3	535.7

Outlet Structure: Composite Outlet Structure #2

- Culvert: 90 ft – 12" diameter pipe (n=0.011) @ 0.5% slope
- Tailwater: Free Outfall

This drainage area discharges to a bioretention infiltration system prior to reaching the detention pond. To be conservative, it was assumed no runoff losses were obtained from infiltration and the entire drainage area runoff volume was routed to the detention system.

Table 6.9: Drainage Area #3 - Underground Storage #3

Storm Event	Inflow (cfs)	Outflow (cfs)	Volume (Ac-ft)	Max Elev (ft)
1-yr	45.5	0.2	2.8	534.7
2-yr	55.9	0.3	3.5	534.9
10-yr	94.9	0.4	6.0	536.0
25-yr	113.0	2.3	6.3	536.1
100-yr	141.9	6.0	6.7	536.3

Outlet Structure: Composite Outlet Structure #1

- Culvert: 52 ft – 18" diameter pipe (n=0.011) @ 1.0% slope (approximate, see note about modeling below)
- Riser: 2.5' x 2.5' catch basin at elevation 536 ft
- Orifice: 3" diameter at elevation 533.5 ft
- Pump: Will be required to discharge to top of Pond #3 (Elevations in model are for gravity flow, actual elevation of underground detention system will be lower and require a pump to discharge to Pond.)
- Tailwater: Wetlands #3

This drainage area discharges to a bioretention infiltration system prior to reaching the detention pond. To be conservative, it was assumed no runoff losses were obtained from infiltration and the entire drainage area runoff volume was routed to the detention system.

Refer to Tables 6.12 through 6.17 for detailed pond requirements and how these requirements are met.

Table 6.12 - Storm Water Pond #1

Requirement	Design
6.1.1 Feasibility Required Elements	
Should not be located in jurisdictional waters	Complies
Evaluate applicability of dam safety rules	Not Applicable
Avoid direction of hotspot runoff to design P-5	Not Applicable
Provide a 2-ft minimum separation between pond bottom and groundwater in sole source aquifer recharge areas.	Not Applicable
6.1.2 Conveyance Required Elements	
Provide a forebay at each pond inflow point	Complies
The channel immediately below an outfall shall be modified to prevent erosion and conform to natural dimensions in the shortest possible distance.	Rip Rap will be proposed at outlets to dissipate flows and direct runoff to an appropriate location.
6.1.3 Pretreatment Required Elements	
Pond shall have a forebay or pre-treatment	Complies
The forebay shall be sized to contain 10% of the WQv and shall be 4-6 ft deep.	The total WQv required for this pond is 0.1 Ac-ft. 0.1 Ac-ft (100%) is provided in the forebay. The forebay is 4-ft deep and has a 15-ft aquatic bench. Refer to Pond Volume Worksheet in Appendix D.
The forebay shall have non-erosive outlets	Will Comply
Direct access shall be provided to the forebay	Will Comply
In sole source aquifers, 100% of the WQv from hotspots shall be provided in pretreatment	Not Applicable
6.1.4 Treatment Required Elements	
Provide WQ storage to comply with Table 6.1	Practices are designed to provide WQv as 100% permanent pool. Refer to Pond Volume Worksheet in Appendix D.
WQv cannot be met just by meeting CPv	Complies
The min. length to width ratio is 1.5:1	Complies
Provide a min. surface area:Drainage Area of 1:100	Surface Area (0.4 Ac):Drainage Area (6.4 Ac) = 1:16
6.1.5 Landscaping	
Pond shall have 4:1 side slopes or a 15-ft safety bench and a 15-ft aquatic bench with a maximum depth of 18 in.	Complies – pond proposes a 4:1 slopes to the water surface elevation and a 10-ft aquatic bench with a maximum depth of 12 in.
Provide a landscaping plan for the pond & buffer areas	Will Comply
Provide a 25-ft wide pond buffer from WSE.	Complies
No woody vegetation within 15-ft of embankment toe and 25-ft from principal spillway	Will need to be verified for compliance
6.1.5 Maintenance	
A legally binding and enforceable maintenance agreement should be executed as a condition of approval	Will Comply
The principal spillway shall have a removable trash rack and be accessible from dry land	Will Comply
Remove sediment from forebay every 5-6 years or after 50% of capacity loss	Will Comply
A maintenance easement shall be granted to jurisdictional authority	Will comply
A low flow orifice shall be provided with a size sufficient to prevent clogging.	Minimum 3-inch orifice proposed.
Locate riser within embankment	Will Comply
Except where local slopes prohibit, equip each pond with a drain pipe capable of partially or completely draining the pond within 24 hours.	The grades will not support a gravity pond drain. Pond will be required to be pumped to drain.
Provide an adjustable gate valve if WQv-ED is not discharged through a weir.	WQv-ED is discharged through a weir outlet structure.
Side slopes shall not exceed 3:1	Side slopes are 4:1
Principal spillway shall not permit access by small children.	Will Comply

Table 6.13 - Underground Detention #2A

Requirement	Design
6.1.1 Feasibility Required Elements	
Should not be located in jurisdictional waters	Complies
Evaluate applicability of dam safety rules	Not Applicable
Avoid direction of hotspot runoff to design P-5	Not Applicable
Provide a 2-ft minimum separation between pond bottom and groundwater in sole source aquifer recharge areas.	Not Applicable
6.1.2 Conveyance Required Elements	
Provide a forebay at each pond inflow point	Pretreatment will be provided by a forebay
The channel immediately below an outfall shall be modified to prevent erosion and conform to natural dimensions in the shortest possible distance.	Rip Rap will be proposed at outlets to dissipate flows and direct runoff to an appropriate location.
6.1.3 Pretreatment Required Elements	
Pond shall have a forebay or pre-treatment	See Above
The forebay shall be sized to contain 10% of the WQv and shall be 4-6 ft deep.	0.6 Ac-ft of volume is required in the forebay. The volume provided is 0.7 Ac-ft.
The forebay shall have non-erosive outlets	Will Comply
Direct access shall be provided to the forebay	Will Comply
In sole source aquifers, 100% of the WQv from hotspots shall be provided in pretreatment	Not Applicable
1.1.4 Treatment Required Elements	
Provide WQ storage to comply with Table 6.1	100% of required water quality volume is provided through permanent detention.
WQv cannot be met just by meeting CPv	Complies
The min. length to width ratio is 1.5:1	Complies
Provide a min. surface area:Drainage Area of 1:100	Not Applicable
6.1.5 Landscaping	
Pond shall have 4:1 side slopes or a 15-ft safety bench and a 15-ft aquatic bench with a maximum depth of 18 in.	4:1 slopes are provided for forebay with a 10-ft aquatic bench and a maximum depth of 12 in.
Provide a landscaping plan for the pond & buffer areas	Will Comply
Provide a 25-ft wide pond buffer from WSE.	Will need to be coordinated during final design.
No woody vegetation within 15-ft of embankment toe and 25-ft from principal spillway	Will Comply
1.1.5 Maintenance	
A legally binding and enforceable maintenance agreement should be executed as a condition of approval	Will Comply
The principal spillway shall have a removable trash rack and be accessible from dry land	System will have access points
Remove sediment from forebay every 5-6 years or after 50% of capacity loss	Will Comply
A maintenance easement shall be granted to jurisdictional authority	Will comply
A low flow orifice shall be provided with a size sufficient to prevent clogging.	Not applicable - System discharges to detention pond and 5 th order water body.
Locate riser within embankment	Not applicable
Except where local slopes prohibit, equip each pond with a drain pipe capable of partially or completely draining the pond within 24 hours.	Will comply
Provide an adjustable gate valve is WQv-ED is not discharged through a weir.	Not Applicable
Side slopes shall not exceed 3:1	Not Applicable
Principal spillway shall not permit access by small children.	Will Comply

Table 6.14 - Storm Water Pond #2B

Requirement	Design
6.1.1 Feasibility Required Elements	
Should not be located in jurisdictional waters	Complies
Evaluate applicability of dam safety rules	Not Applicable per grading proposed
Avoid direction of hotspot runoff to design P-5	Not Applicable
Provide a 2-ft minimum separation between pond bottom and groundwater in sole source aquifer recharge areas.	Not Applicable
6.1.2 Conveyance Required Elements	
Provide a forebay at each pond inflow point	Complies
The channel immediately below an outfall shall be modified to prevent erosion and conform to natural dimensions in the shortest possible distance.	Will outfall to storm sewer system.
6.1.3 Pretreatment Required Elements	
Pond shall have a forebay or pre-treatment	Complies
The forebay shall be sized to contain 10% of the WQv and shall be 4-6 ft deep.	The required forebay volume is 1.3 Ac-ft, the volume provided is 1.6 Ac-ft.
The forebay shall have non-erosive outlets	Will Comply
Direct access shall be provided to the forebay	Will Comply
In sole source aquifers, 100% of the WQv from hotspots shall be provided in pretreatment	Not Applicable
1.1.4 Treatment Required Elements	
Provide WQ storage to comply with Table 6.1	100% of water quality volume is provided through permanent retention.
WQv cannot be met just by meeting CPv	Complies
The min. length to width ratio is 1.5:1	Complies
Provide a min. surface area:Drainage Area of 1:100	Surface Area (0.8 Ac):Drainage Area (41 Ac) = 1:51
6.1.5 Landscaping	
Pond shall have 4:1 side slopes or a 15-ft safety bench and a 15-ft aquatic bench with a maximum depth of 18 in.	Complies – pond proposes a 4:1 slopes to the water surface elevation and a 10-ft aquatic bench with a maximum depth of 12 in.
Provide a landscaping plan for the pond & buffer areas	Will Comply
Provide a 25-ft wide pond buffer from WSE.	Will need to be coordinated during final design
No woody vegetation within 15-ft of embankment toe and 25-ft from principal spillway	Will Comply
1.1.5 Maintenance	
A legally binding and enforceable maintenance agreement should be executed as a condition of approval	Will Comply
The principal spillway shall have a removable trash rack and be accessible from dry land	Will Comply
Remove sediment from forebay every 5-6 years or after 50% of capacity loss	Will Comply
A maintenance easement shall be granted to jurisdictional authority	Will comply
A low flow orifice shall be provided with a size sufficient to prevent clogging.	Not Applicable
Locate riser within embankment	Will Comply
Except where local slopes prohibit, equip each pond with a drain pipe capable of partially or completely draining the pond within 24 hours.	Will Comply
Provide an adjustable gate valve is WQv-ED is not discharged through a weir.	WQv-ED is discharged through a weir outlet structure.
Side slopes shall not exceed 3:1	Side slopes are 4:1
Principal spillway shall not permit access by small children.	Will Comply

Table 6.15 – Underground Detention #2D

Requirement	Design
6.1.1 Feasibility Required Elements	
Should not be located in jurisdictional waters	Complies
Evaluate applicability of dam safety rules	Complies
Avoid direction of hotspot runoff to design P-5	Not Applicable
Provide a 2-ft minimum separation between pond bottom and groundwater in sole source aquifer recharge areas.	Not Applicable
6.1.2 Conveyance Required Elements	
Provide a forebay at each pond inflow point	Complies
The channel immediately below an outfall shall be modified to prevent erosion and conform to natural dimensions in the shortest possible distance.	Will outfall to storm sewer system.
6.1.3 Pretreatment Required Elements	
Pond shall have a forebay or pre-treatment	Will comply through the use of a vegetated swale and underground storage
The forebay shall be sized to contain 10% of the WQv and shall be 4-6 ft deep.	Will Comply
The forebay shall have non-erosive outlets	Will Comply
Direct access shall be provided to the forebay	Will Comply
In sole source aquifers, 100% of the WQv from hotspots shall be provided in pretreatment	Not Applicable
1.1.4 Treatment Required Elements	
Provide WQ storage to comply with Table 6.1	100% of water quality volume will be provided
WQv cannot be met just by meeting CPv	Complies
The min. length to width ratio is 1.5:1	Complies
Provide a min. surface area:Drainage Area of 1:100	Not Applicable – Underground Detention
6.1.5 Landscaping	
Pond shall have 4:1 side slopes or a 15-ft safety bench and a 15-ft aquatic bench with a maximum depth of 18 in.	Not Applicable
Provide a landscaping plan for the pond & buffer areas	Not Applicable
Provide a 25-ft wide pond buffer from WSE.	Not Applicable
No woody vegetation within 15-ft of embankment toe and 25-ft from principal spillway	Not Applicable
1.1.5 Maintenance	
A legally binding and enforceable maintenance agreement should be executed as a condition of approval	Will Comply
The principal spillway shall have a removable trash rack and be accessible from dry land	Port holes will be provided for access.
Remove sediment from forebay every 5-6 years or after 50% of capacity loss	Will Comply
A maintenance easement shall be granted to jurisdictional authority	Will comply
A low flow orifice shall be provided with a size sufficient to prevent clogging.	Not Applicable
Locate riser within embankment	Not Applicable
Except where local slopes prohibit, equip each pond with a drain pipe capable of partially or completely draining the pond within 24 hours.	Will Comply
Provide an adjustable gate valve is WQv-ED is not discharged through a weir.	WQv-ED is discharged through a weir outlet structure.
Side slopes shall not exceed 3:1	Not Applicable
Principal spillway shall not permit access by small children.	Not Applicable

Table 6.16 – Underground Detention #2E

Requirement	Design
6.1.1 Feasibility Required Elements	
Should not be located in jurisdictional waters	Complies
Evaluate applicability of dam safety rules	Complies
Avoid direction of hotspot runoff to design P-5	Not Applicable
Provide a 2-ft minimum separation between pond bottom and groundwater in sole source aquifer recharge areas.	Not Applicable
6.1.2 Conveyance Required Elements	
Provide a forebay at each pond inflow point	Complies
The channel immediately below an outfall shall be modified to prevent erosion and conform to natural dimensions in the shortest possible distance.	Will outfall to storm sewer system.
6.1.3 Pretreatment Required Elements	
Pond shall have a forebay or pre-treatment	Complies
The forebay shall be sized to contain 10% of the WQv and shall be 4-6 ft deep.	Required forebay volume is 0.1 Ac-ft, provided volume is 0.6 Ac-ft.
The forebay shall have non-erosive outlets	Will Comply
Direct access shall be provided to the forebay	Will Comply
In sole source aquifers, 100% of the WQv from hotspots shall be provided in pretreatment	Not Applicable
1.1.4 Treatment Required Elements	
Provide WQ storage to comply with Table 6.1	100% of water quality volume will be provided through permanent detention.
WQv cannot be met just by meeting CPv	Complies
The min. length to width ratio is 1.5:1	Complies
Provide a min. surface area:Drainage Area of 1:100	Not Applicable – Underground Detention
6.1.5 Landscaping	
Pond shall have 4:1 side slopes or a 15-ft safety bench and a 15-ft aquatic bench with a maximum depth of 18 in.	Forebay will have 4:1 side slopes, a 10 ft aquatic bench and a maximum depth of 12 in.
Provide a landscaping plan for the pond & buffer areas	Forebay will comply
Provide a 25-ft wide pond buffer from WSE.	Forebay will comply
No woody vegetation within 15-ft of embankment toe and 25-ft from principal spillway	Forebay will comply
1.1.5 Maintenance	
A legally binding and enforceable maintenance agreement should be executed as a condition of approval	Will Comply
The principal spillway shall have a removable trash rack and be accessible from dry land	Access will be from a manhole.
Remove sediment from forebay every 5-6 years or after 50% of capacity loss	Will Comply
A maintenance easement shall be granted to jurisdictional authority	Will comply
A low flow orifice shall be provided with a size sufficient to prevent clogging.	Not Applicable
Locate riser within embankment	Not Applicable
Except where local slopes prohibit, equip each pond with a drain pipe capable of partially or completely draining the pond within 24 hours.	Will Comply
Provide an adjustable gate valve is WQv-ED is not discharged through a weir.	WQv-ED is discharged through a weir outlet structure.
Side slopes shall not exceed 3:1	Side slopes in forebay will be 4:1.
Principal spillway shall not permit access by small children.	Not Applicable

Table 6.17 - Underground Detention #3

Requirement	Design
6.1.1 Feasibility Required Elements	
Should not be located in jurisdictional waters	Complies
Evaluate applicability of dam safety rules	Not Applicable
Avoid direction of hotspot runoff to design P-5	Not Applicable
Provide a 2-ft minimum separation between pond bottom and groundwater in sole source aquifer recharge areas.	Not Applicable
6.1.2 Conveyance Required Elements	
Provide a forebay at each pond inflow point	Complies
The channel immediately below an outfall shall be modified to prevent erosion and conform to natural dimensions in the shortest possible distance.	Will outfall to storm sewer system.
6.1.3 Pretreatment Required Elements	
Pond shall have a forebay or pre-treatment	Complies
The forebay shall be sized to contain 10% of the WQv and shall be 4-6 ft deep.	The required forebay volume is 0.5 Ac-ft, the provided volume is 0.9 Ac-ft.
The forebay shall have non-erosive outlets	Will Comply
Direct access shall be provided to the forebay	Will Comply
In sole source aquifers, 100% of the WQv from hotspots shall be provided in pretreatment	Not Applicable
1.1.6 Treatment Required Elements	
Provide WQ storage to comply with Table 6.1	100% of water quality volume provided in permanent detention.
WQv cannot be met just by meeting CPv	Complies
The min. length to width ratio is 1.5:1	Complies
Provide a min. surface area:Drainage Area of 1:100	Complies
6.1.5 Landscaping	
Pond shall have 4:1 side slopes or a 15-ft safety bench and a 15-ft aquatic bench with a maximum depth of 18 in.	Complies – forebay proposes a 4:1 slopes to the water surface elevation and a 10-ft aquatic bench with a maximum depth of 12 in.
Provide a landscaping plan for the pond & buffer areas	Forebay Will Comply
Provide a 25-ft wide pond buffer from WSE.	Forebay will Comply
No woody vegetation within 15-ft of embankment toe and 25-ft from principal spillway	Forebay will comply.
1.1.7 Maintenance	
A legally binding and enforceable maintenance agreement should be executed as a condition of approval	Will Comply
The principal spillway shall have a removable trash rack and be accessible from dry land	Port holes will provide access.
Remove sediment from forebay every 5-6 years or after 50% of capacity loss	Will Comply
A maintenance easement shall be granted to jurisdictional authority	Will comply
A low flow orifice shall be provided with a size sufficient to prevent clogging.	Storage volume to pump 1-year storm into and release through a 3-inch orifice is provided.
Locate riser within embankment	Will Comply
Except where local slopes prohibit, equip each pond with a drain pipe capable of partially or completely draining the pond within 24 hours.	The grades will not support a gravity pond drain. Pond will be required to be pumped to drain.
Provide an adjustable gate valve is WQv-ED is not discharged through a weir.	WQv-ED is discharged through a weir outlet structure.
Side slopes shall not exceed 3:1	Side slopes are 4:1
Principal spillway shall not permit access by small children.	Will Comply

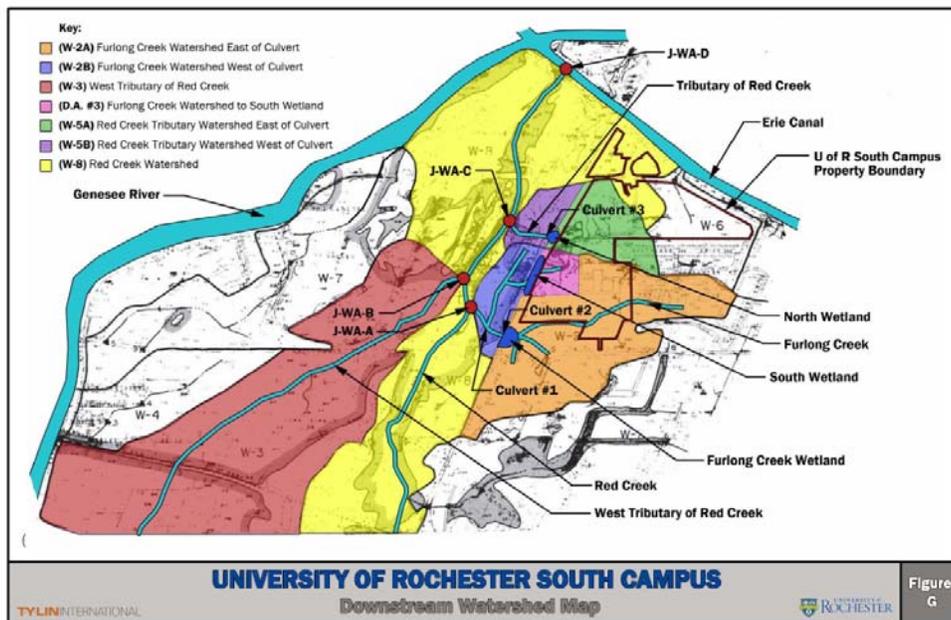
The design complies with NYSDEC and the Town of Brighton development standards for attenuation of post-development runoff rates.

7. Point #2: Post-Development Project Impacts Downstream

The proposed development will have only positive impacts on the natural downstream watercourses and their respective drainage areas. This is accomplished by reducing the drainage area from the re-zone property to these discharge points and providing additional detention volume prior to discharge. The drainage area to the south wetlands (D.A. #3) will increase; however, storage volume has been provided for the additional runoff volume this area will receive. The ponding in the wetland area will not be higher than the lowest point in the ridge (after amenity improvements) between this area and the Furlong Creek drainage area so all runoff will be completely contained in this area. The drainage area to the Erie Canal is also proposed to be increased. The Erie Canal is a man-made 5th order water body designed to be at the bottom of the watershed. Refer to Figure in Appendix A for Erie Canal 5th order calculation. The canal is capable of handling the additional volume without any negative downstream impacts. The drainage from the rezone property reaches the Erie Canal by four (4) different routes: the existing DOT detention pond, the existing U of R detention pond, the Kendrick Drive storm sewer system and sheet drainage to the I-390 storm sewer system. Detention has been provided upstream of each of these points to attenuate post-development runoff rates to pre-development conditions.

A downstream analysis was done to look at the effects of the proposed detention system and hydrologic changes in respect to the overall watershed drainage of Red Creek. Red Creek is located west of the site and flows north to the Erie Canal. Furlong Creek confluences with Red Creek, just upstream of the project area. This confluence point is delineated as Analysis Point 'A' in this report. The second major confluence is downstream where the West Tributary of Red Creek joins Red Creek. This confluence point is delineated as Analysis Point 'B' in this report. The next confluence point downstream is the Red Creek Tributary which joins on the east side of the creek. This confluence point is delineated as Analysis Point 'C' in this report. Analysis Point 'D' is the location where Red Creek meets the Erie Canal. Refer to Figure 7.1 for a map of the downstream watershed.

Figure 7.1 Downstream Watershed



The U of R rezoned property is approximately 180 acres so in following the 10% rule outlined in the New York Stormwater Management Design Manual an area of 1,800 acres was analyzed. Due to the project's location at the bottom end of the Red Creek watershed, the study area extended from the Erie Canal upstream to a watershed area of 1,800 acres. This is approximately the point just downstream of the confluence of Red Creek with the West Tributary of Red Creek. The downstream study area therefore included Furlong Creek. As an additional measure, a general look at the watershed hydrograph for Red Creek upstream of the confluence with Furlong Creek was looked at.

Red Creek and the West Tributary of Red Creek have been studied and are detailed in the Monroe County Flood Insurance Study (FIS), last updated August 2008. The entire Red Creek watershed is approximately 22 square miles and the West Tributary of Red Creek watershed is approximately 3 square miles. Refer to Table 7.1 for the flow rates and velocities listed for Red Creek at Crittenden Road in the FIS (Refer to Appendix C for applicable pages of the FIS):

Table 7.1 – Red Creek & West Trib. Flood Insurance Study Rates & Velocities

Storm Event	Red Creek @ Pt A		Red Creek @ Pt B		Red Creek @ Pt D		West Trib. Of Red Creek	
	Rate (cfs)	Velocity (fps)	Rate (cfs)	Velocity (fps)	Rate (cfs)	Velocity (fps)	Rate (cfs)	Velocity (fps)
10-Yr	1129	2.5	1134	2.6	1235	3.0	300	2.5 (assumed)
50-Yr	1810		1818		1967		440	
100-Yr	2030		2039		2205		510	

The longest flow path for Red Creek and the West Tributary of Red Creek were calculated using New York Streamstats program and the velocities listed in the FIS. Refer to Appendix A for a map of the drainage areas and flow paths. The weighted CN numbers and time of concentrations were modified slightly to obtain a similar peak runoff rate for the hydrographs as was listed in the FIS.

The Town of Brighton Townwide Drainage Study assigned a naming convention for the downstream watersheds and culvert. A similar, but slightly modified naming convention was used in this report for a more detailed analysis. Refer to table 7.2 for the naming convention. Refer to Appendix A for the Downstream Watershed Map.

Table 7.2 – Drainage Area, Culvert & Analysis Point Designations

Designation	Description	Source
W-8	Red Creek Watershed	Townwide Study
W-8 @ A	Red Creek Watershed North of confluence with Furlong Creek	TYLI Drainage Report
W-8 @ D	Red Creek watershed between confluence with Furlong Creek and confluence with Erie Canal	TYLI Drainage Report
W-3	West Tributary of Red Creek watershed	Townwide Study
W-2	Furlong Creek Watershed (includes drainage areas #3, #4 & #5)	Townwide Study
W-2A	Furlong Creek watershed east of Lehigh Valley (L.V.) Trail	TYLI Drainage Report
W-2B	Furlong Creek watershed west of L.V. Trail	TYLI Drainage Report
W-5	Red Creek North Tributary watershed	Townwide Study
W-5A	Red Creek North Tributary watershed east of L.V. Trail (is equivalent to drainage area #1)	TYLI Drainage Report
W-5B	Red Creek North Tributary watershed west of L.V. Trail	TYLI Drainage Report
#1	Analysis Point on Furlong Creek just above confluence with Red Creek	Townwide Study
#2	Culvert for Furlong Creek under L.V. trail berm	Townwide Study
#3	Culvert for North Red Creek Tributary under L.V. trail berm	Townwide Study
#7 & #8	Culverts for South Wetland under L.V. trail berm	Townwide Study

The drainage area for Furlong Creek was developed based on available topographic information and the area delineated in the Townwide Drainage Study. Based on this information, a drainage area of 0.42 square miles (271 Ac) for Furlong Creek was developed. The longest flow path was developed to determine a hydrograph for the peak runoff rate from this watershed. This information was used to review the timing of the proposed detention discharges with the Furlong Creek peak hydrograph timing. Refer to Appendix A for a map of the Furlong Creek drainage area.

A combination of record data from the Townwide Study, Streamstats and the Monroe County Flood Insurance Study (FIS), along with ground cover delineations and Pondpac was used to develop approximate hydrographs of the surrounding watersheds. Refer to Table 7.3 for the existing information.

Table 7.3 – Existing Drainage Areas

Drainage Area	Area (acres)	Weighted CN*	Tc (hrs)	Storm Event	Runoff Rate (cfs)
W-5B Northern Red Creek Tributary	35.3	80	0.3	1-Yr	24.7
				2-Yr	32.6
				10-Yr	64.8
				25-Yr	80.4
				50-Yr	96.4
W-2A (includes D.A. #4 & D.A. #5) Furlong Creek	189.8	77	1.6	100-Yr	106.1
				1-Yr	33.5
				2-Yr	46.3
				10-Yr	102.5
				25-Yr	130.8
W-2B Furlong Creek	45.2	74	0.3	50-Yr	160.1
				100-Yr	178.2
				1-Yr	17.5
				2-Yr	25.6
				10-Yr	60.7
W-8 @ A Red Creek	11,968	69	9.5	25-Yr	78.6
				50-Yr	97.2
				100-Yr	108.6
				1-Yr	277.6
				2-Yr	411.1
W-3 Red Creek	1,920	66	4.2	10-Yr	1057.6**
				25-Yr	1409.8
				50-Yr	1788.8**
				100-Yr	2027.0**
				1-Yr	50.9
W-8 @ D Red Creek	196.2	43.4	1.8	2-Yr	83.1
				10-Yr	252.9**
				25-Yr	349.9
				50-Yr	456.0**
				100-Yr	523.3**
O-W8@D Red Creek	-	-	-	1-Yr	0
				2-Yr	0
				10-Yr	1.4
				25-Yr	3.5
				50-Yr	7.5
O-W8@D Red Creek	-	-	-	100-Yr	10.9
				1-Yr	316.4
				2-Yr	468.2
				10-Yr	1190.5**
				25-Yr	1598.5
O-W8@D Red Creek	-	-	-	50-Yr	2038.6**
				100-Yr	2315.7**

*The Curve Number (CN) shown is a weighted calculation based on percentages of undeveloped ground cover and impervious surfaces per subarea. Refer to Appendix D for the drainage computations.

** Flow Rates closely match FIS study flow rates.

*** For Drainage Areas #1 & #3 Refer to Existing Conditions in section 6.

The proposed conditions of the surrounding watersheds were modified based on changes resulting from the project. Refer to Table 7.4 for the Proposed Drainage Areas.

Table 7.4 – Proposed Drainage Areas

Drainage Area	Area (acres)	Weighted CN*	Tc (hrs)	Storm Event	Runoff Rate (cfs)
W-2A (includes D.A. #4 & D.A. #5) Furlong Creek	173.2	77	1.6	1-Yr	30.2
				2-Yr	41.8
				10-Yr	92.9
				25-Yr	118.6
				50-Yr	145.3
				100-Yr	161.7
W-2B Furlong Creek	45.2	74	0.3	1-Yr	17.5
				2-Yr	25.6
				10-Yr	60.7
				25-Yr	78.6
				50-Yr	97.2
				100-Yr	108.6
W-8 @ A Red Creek	11,968	69	9.5	1-Yr	277.6
				2-Yr	411.1
				10-Yr	1057.6**
				25-Yr	1409.8
				50-Yr	1788.8**
				100-Yr	2027.0**
W-3 Red Creek	1,920	66	4.2	1-Yr	50.9
				2-Yr	83.1
				10-Yr	252.9**
				25-Yr	349.9
				50-Yr	456.0**
				100-Yr	523.3**
W-8 @ D Red Creek	196.2	43.4	1.8	1-Yr	0
				2-Yr	0
				10-Yr	1.4
				25-Yr	3.5
				50-Yr	7.5
				100-Yr	10.9
O-W8@D Red Creek	-	-	-	1-Yr	313.6
				2-Yr	464.3
				10-Yr	1180.0**
				25-Yr	1574.1
				50-Yr	2012.5**
				100-Yr	2286.9**

*The Curve Number (CN) shown is a weighted calculation based on percentages of undeveloped ground cover and impervious surfaces per subarea. Refer to Appendix D for the drainage computations.

** Flow Rates closely match FIS study flow rates.

*** For Drainage Areas #1A, #1B, #3A & #3B Refer to Proposed Conditions in section 6.

To determine the effects of the proposed developed on downstream runoff rates and flooding volumes the railroad culverts and wetland storage areas were added to the models for subareas #1 & #3. Subarea #2 is not affected by a culvert restriction. The wetland and culvert restriction for Furlong Creek was also added to the model. Refer to Appendix D for the complete results of the calculations and analysis. Refer to tables 7.5 for a summary of the results.

Table 7.5 - Site Run-off w/ Culvert Restrictions & Wetland Storage

Drainage Area	Design Storm	Existing Run off (cfs)	Proposed Run off (cfs)
Subarea 1 (W-5) Northern Red Creek Tributary <i>Ex: (J-3)</i> <i>Pr: (J-3)</i>	1-yr	27.8	6.2
	2-yr	36.7	7.5
	10-yr	72.2	13.6
	25-yr	89.4	16.4
	100-yr	117.4	19.5
Subarea 3 South Wetlands <i>Ex: (S. Wetland OUT)</i> <i>Pr: (J-7)</i>	1-yr	8.1	0
	2-yr	11.1	
	10-yr	24.4	
	25-yr	30.7	
	100-yr	41.0	
Subarea W-2 (inc. DA #4 & 5) Furlong Creek <i>Ex: (J-1)</i> <i>Pr: (J-1)</i>	1-yr	33.0	24.7
	2-yr	40.4	33.5
	10-yr	73.7	70.7
	25-yr	95.4	91.0
	100-yr	133.0	125.9
Analysis Pt A Red Creek <i>Ex/Pr: (J-W8-A)</i>	1-yr	283.8	281.8
	2-yr	420.7	417.2
	10-yr	1077.1	1069.2
	25-yr	1438.9	1423.9
	100-yr	2078.3	2049.6
Analysis Pt B Red Creek <i>Ex/Pr: (J-W8-B)</i>	1-yr	314.5	311.9
	2-yr	465.8	462.2
	10-yr	1183.6	1175.4
	25-yr	1588.7	1566.8
	100-yr	2301.0	2276.0
Analysis Pt C Red Creek <i>Ex/Pr: (J-W8-C)</i>	1-yr	316.4	313.6
	2-yr	468.2	464.3
	10-yr	1189.2	1178.7
	25-yr	1596.1	1571.6
	100-yr	2311.1	2282.2
Analysis Pt D Red Creek <i>Ex/Pr: (O-W8-D)</i>	1-yr	316.4	313.6
	2-yr	468.2	464.3
	10-yr	1190.5	1180.0
	25-yr	1598.5	1574.1
	100-yr	2315.7	2286.9

The overall watershed discharge rates to the natural waterbodies are decreased as a result of the project. This is accomplished by reducing the watershed area and creating a storage space in Drainage Area #3 that can completely contain the 100-year storm. Detention and attenuation in Drainage Area #1 further reduces the peak runoff rate. These rate reductions to the tributaries of Red Creek help to also have a slight decrease on the runoff rate of Red creek downstream of the project.

Table 7.6 shows the project's effects on the stormwater runoff rate and ponding elevations in the receiving north wetland (D.A. #1), south wetland (D.A. #3) and Furlong Creek wetland (D.A. #4).

Table 7.6: North Wetland Volume & Elevation (D.A. #1/W-5)

Existing	Storm Event	Inflow (cfs)	Outflow (cfs)	Volume (Ac-ft)	Max Elev (ft)
	1-yr	21.4	9.7	0.8	526.5
	2-yr	27.9	11.7	1.0	526.7
	10-yr	53.8	19.2	2.3	527.3
	25-yr	66.4	22.1	3.0	527.6
	100-yr	87.1	25.8	4.1	527.9
Proposed	1-yr	11.8	6.2	0.4	526.1
	2-yr	15.7	7.5	0.5	526.2
	10-yr	32.6	13.6	1.3	526.8
	25-yr	41.0	16.4	1.7	527.0
	100-yr	49.5	18.3	2.1	527.2

Outlet Structure: Composite Outlet Structure RC

- Culvert: 26' – 2'x2' box culvert (n=0.013) @ 11.5% slope

Table 7.7: South Wetland Volume & Elevation (D.A. #3)

	Storm Event	Inflow (cfs)	Outflow (cfs)	Volume (Ac-ft)	Max Elev (ft)
Existing	1-yr	41.4	8.1	1.2	525.7
	2-yr	51.5	11.1	1.6	525.8
	10-yr	90.4	24.4	2.6	525.9
	25-yr	108.5	30.7	3.2	526.0
	100-yr	137.7	41.0	4.3	526.2
Proposed	1-yr	27.4		2.7	526.3
	2-yr	33.5		3.3	526.4
	10-yr	56.7	0	5.5	526.7
	25-yr	67.3		7.4	526.9
	100-yr	84.4		10.6	527.2

Outlet Structure: Composite Outlet Structure #RCTB

- Culvert: 150' – 12" (n=0.011) @ 0.5% slope
- Riser: 2.5' x 2.5' at elev. 527.2
- Orifice: 12 – 1" perforations at elev. 526.74 ft
- Tailwater: Constant @ elev. 520.5 ft

Table 7.4: Furlong Creek Wetland Volume & Elevation (W-2)

	Storm Event	Inflow (cfs)	Outflow (cfs)	Volume (Ac-ft)	Max Elev (ft)
Existing	1-yr	41.1	30.9	6.3	521.0
	2-yr	56.6	37.9	7.2	521.3
	10-yr	123.9	62.6	12.4	522.6
	25-yr	157.3	70.8	15.4	523.2
	100-yr	213.0	78.5	21.4	523.8
Proposed	1-yr	30.6	22.6	5.7	520.8
	2-yr	42.3	30.8	6.3	521.0
	10-yr	93.6	52.0	9.7	522.0
	25-yr	119.4	60.3	11.8	522.5
	100-yr	162.6	70.9	15.4	523.2

Outlet Structure: Composite Outlet Structure RC

- Culvert: 90' – 2.5'x3' box culvert (n=0.013) @ 0.3% slope
- Tailwater: Constant @ elev. 520.5 ft

The post-development drainage to the Red Creek tributary will have a 83% reduction in the pre-development runoff rate for the 100-yr storm event and a 38% reduction in the pre-development runoff volume. The post-development drainage to Furlong Creek will have a 5% reduction in the pre-development runoff rate for the 100-yr storm event and a 27% reduction in the pre-development runoff volume. The maximum ponding elevations for each of the storm events will decrease in the North wetland and the Furlong Creek wetland. The ponding elevation in the South Wetland will increase as a result of the additional drainage area to this location. The ponding elevation will not overflow; to the Furlong Creek drainage area, the Lehigh Valley Trail, or the proposed outlet structure. The runoff rate to the South Wetland will be reduced significantly from existing conditions which will cause the ponding water to rise more slowly and allow the maximum extent possible to infiltrate to the soil.

The timing of the U of R discharges to the Red Creek Tributary (D.A. #1) and Furlong Creek (D.A. #3) watershed was also looked at to ensure the proposed detention did not cause the runoff rates peak to align with the receiving watersheds or Red Creek. In both instances, the project discharge peaks occurred before the receiving watershed peak and the receiving watershed peak occurred before the Red Creek watershed peak for existing conditions. This same timing was maintained for proposed conditions. Refer to the hydrographs provided in Appendix C.

The project will not result in negative impacts to downstream waters and will provide positive impacts.

8. Point #3: Pre- vs. Post-Development Runoff Volume

Any development which replaces pervious ground cover with impervious ground cover will result in a higher runoff volume from the developed area. The soils in the rezone area are not believe to be conducive to infiltration and many areas have a high ground water table which limits the extent volume infiltration practices can be employed. However, infiltration practices have been designed to take advantage of any infiltration capacity the soils may possess in reducing runoff volume. As discussed in Point #2, the post-developed stormwater management plan will redirect this additional volume, plus some existing runoff volume to locations with practices designed to promote infiltration. The practices promote infiltration by replacing the soil below the practice with engineered soil designed for infiltration. Underdrain is provided at the bottom of the infiltration soil layers as an additional drainage measure in the event that the natural soils below this layer do not infiltrate runoff. A conservative approach was taken in the volume runoff analysis. The practices were assumed to not infiltrate runoff and all runoff volume was assumed to reach the receiving water through overland or closed conduit flow.

The infiltration practices proposed in the post-developed stormwater management plan include: bioretention systems and proprietary filtration devices compliant with the NYSDEC requirements. Additional practices to achieve further volume infiltration such as: dry swales, disconnected rooftop runoff and vegetated swales may be incorporated into the final design plans if desired to further increase the runoff reduction volume provided; however, the current plan complies and exceeds the minimum NYSDEC requirements. These practices are discussed in greater detail in section 10.

The existing and proposed runoff volume to the receiving waters are listed in table 8.1.

Table 8.1 – Pre- & Post-Development Volume Comparison for Receiving Waters

Drainage Area	Storm Event	Exist Volume (Ac-ft)	Prop. Volume (Ac-ft)
North Tributary of Red Creek (J-3)	1-yr	5.0	1.8
	2-yr	6.4	2.5
	10-yr	12.0	4.5
	25-yr	14.8	5.8
	100-yr	19.5	7.4
Erie Canal (O-2)	1-yr	8.0	2.6+8.2+0.2+0.7=11.7
	2-yr	10.1	3.1+10.2+0.3+0.8=14.4
	10-yr	18.4	5.0+17.1+0.5+1.3=23.9
	25-yr	22.4	5.9+20.4+0.7+1.5=28.5
	100-yr	29.4	7.3+25.6+0.9+1.9=35.7
Furlong Creek (J-1)	1-yr	13.8	9.8
	2-yr	18.1	13.0
	10-yr	35.9	26.7
	25-yr	44.8	33.6
	100-yr	59.8	45.4

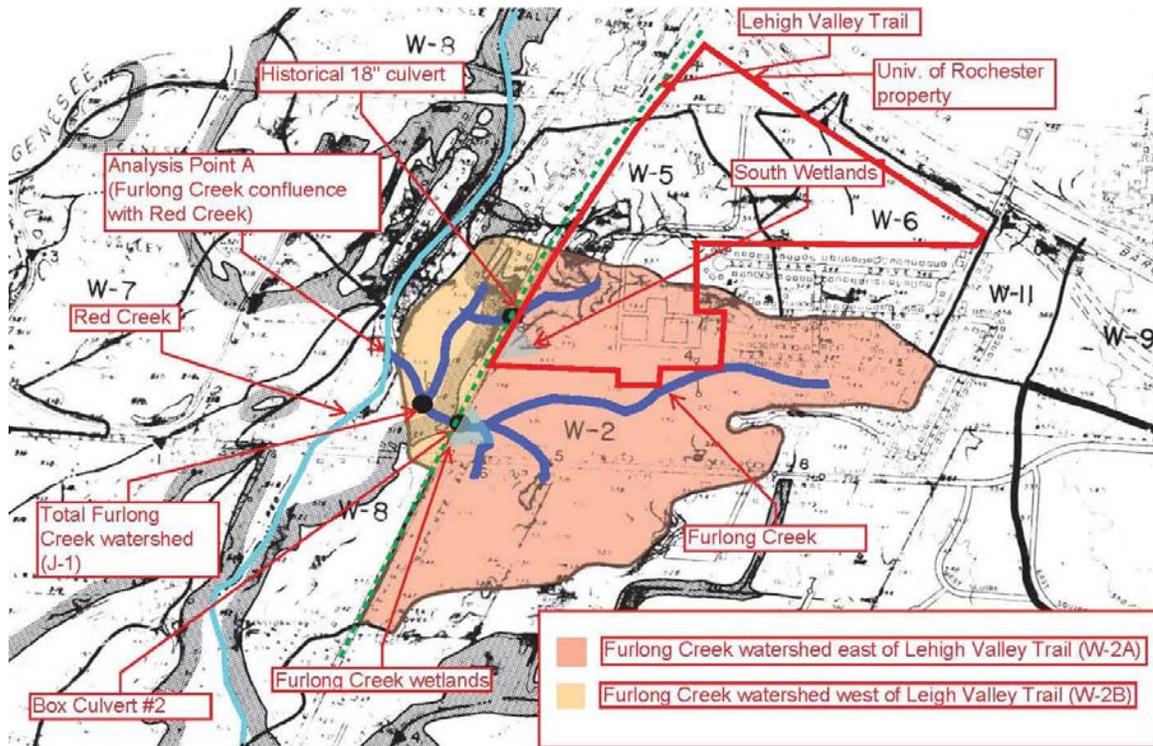
The project will not result in an increase in runoff to any natural receiving waterbody. Areas that will receive a volume increase are appropriately sized to handle the increased volume.

9. Point #4: Post Development Project Impacts to Existing Flooding Problem Areas (Furlong Creek Study)

Residential properties located along the north side of Crittenden Road adjacent to the Lehigh Valley Trail berm experience significant and disruptive flooding in their rear yards. The flooding is from drainage in the Furlong Creek watershed. This watershed is restricted by a box culvert under the trail berm. Upstream of the culvert, the Furlong Creek flow area is not well defined into a channel until further upstream. In the same area north of Crittenden Road, but west of the trail berm there is also some flooding problems by the residential properties on Norman and Helen Road. South of the residential area is a 100-year flood zone where ponding would be expected. A drainage ditch directs runoff south from the residential properties through the flood zone to Furlong Creek. Sheet drainage does not always reach the ditch and sometimes causes disruptive flooding to the residential properties.

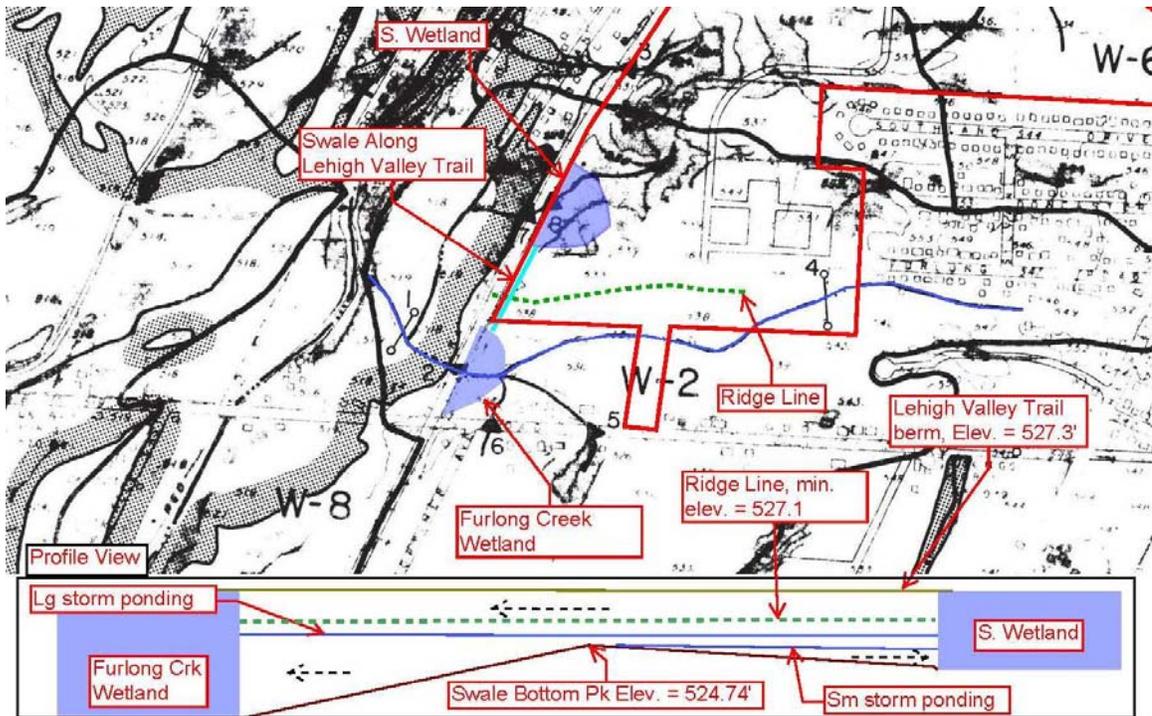
The Town of Brighton commissioned a townwide study in 1978 that included Furlong Creek. This study identified the Furlong Creek watershed to be 0.42 square miles. Of this area, approximately 0.35 square miles is located on the east side of the Lehigh Valley Trail (trail). The Town report refers to the Furlong Creek watershed with the delineation "W-2". This report further subdivides the watershed into "W-2A" for the watershed on the east side of the trail and "W-2B" for the watershed on the west side of the trail. Furlong Creek is restricted at the Lehigh Valley trail location by a 2.5' by 3' stone culvert that passes under the trail (referred to as culvert #2 in the Town report). Upstream of the culvert, the Furlong Creek flow area is not well defined into a channel until further upstream. There is a swale that runs parallel to the residential rear property line's that collects this drainage and routes it to the culvert. A large wetland area exists on the U of R property referred to in this report as the "south wetland" in Drainage Area #3 (D.A. #3). It is believed an 18" culvert once drained this wetland and conveyed drainage under the trail to the west and then south through a drainage ditch to Furlong Creek. This drainage pattern is shown in the map included in the Town Drainage Study. Refer to Figure 9.1 for a copy of the Townwide Drainage Study map. Color and call-outs have been added for clarity.

Figure 9.1 Furlong Creek Drainage Area



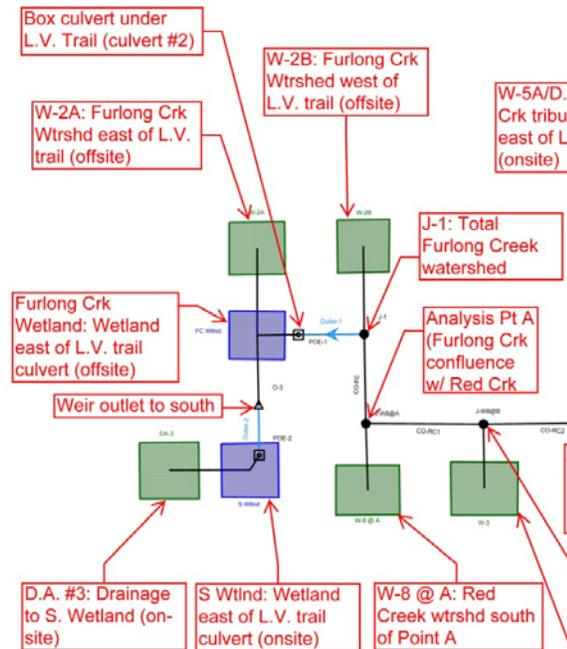
Despite the historical information, a culvert outlet for the south wetlands could not be found by multiple parties. The south wetlands contain a large volume of standing water and storage potential. The standing water exhibits stagnant behavior. Discharge from this wetland area occurs two ways. The first is through slow ground infiltration and evapotranspiration. This would occur over a long period of time for smaller, intermittent storm events. The second discharge point occurs through a swale that runs along the Lehigh Valley embankment. This swale connects the south wetland to the Furlong Creek drainage area to the south. A well defined ridge separates these two drainage areas except for this swale. The swale has a peak in the bottom elevation of it at the ridge line thus directing runoff away in opposing directions from the peak. Large storm events in the south watershed (D.A. #3) that exceed the capacity of the storage area will surmount the high point in the swale and flow south into the Furlong Creek watershed, specifically the Furlong Creek wetland area east of the Lehigh Valley Trail. Refer to Figure 9.2 for a diagram of this drainage pattern.

Figure 9.2 – South Wetland Overflow Swale to Furlong Creek



The drainage patterns were modeled in pondpac with the outflow from the South Wetland directed over the swale high point (via a weir) to the Furlong Creek Watershed. Refer to Figure 9.3 for the Pondpac Existing conditions schematic to for Furlong Creek.

Figure 9.3 – Pondpac Schematic for Furlong Creek – Existing Conditions



Tables 9.1 & 9.2 are the Pondpac hydrologic analysis results for the runoff rates to the South Wetland, Furlong Creek Wetland and Furlong Creek watershed for existing and proposed conditions. Also listed are the existing ponding elevations.

Table 9.1 - Existing Ponding Elevations & Volumes

Storm Event	S. Wetland Elev. (ft)	S. Wetland Vol. (Ac-ft)	Furlong Creek Wetland Elev. (ft)	Furlong Creek Wetland Vol. (Ac-ft)
1-Yr	525.69*	1.2	521.03	6.3
2-Yr	525.77*	1.6	521.29	7.2
10-Yr	525.94*	2.6	522.60	12.4
25-Yr	526.03*	3.2	523.19	15.4
50-Yr	526.11*	3.9	523.62	19.1
100-Yr	526.16*	4.3	523.80	21.4

*Overtops high point in swale (524.74') and a portion of the drainage flows south to Furlong Creek wetlands watershed in the swale; does not surmount ridge line/ground surface above swale (527.1') or Lehigh Valley Trail berm (527.3').

Table 9.2 - Existing Runoff Rates

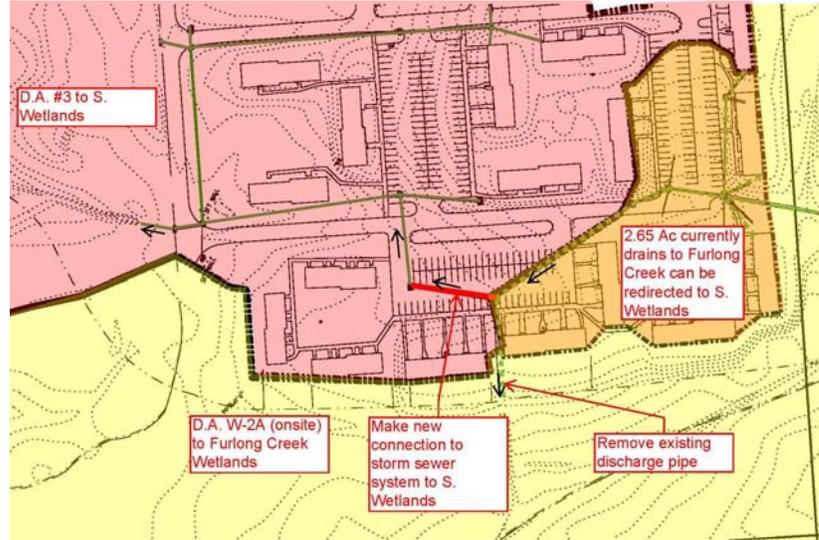
Storm Event	D.A. #3 to S. Wetland (cfs)	S. Wetland to Furlong Creek Wetland (cfs)	W-2A to Furlong Creek Wetland (cfs)	Furlong Creek Wetland culvert discharge (Culv. #2) (cfs)	Total Furlong Creek watershed (cfs)
1-Yr	41.4	8.1	33.5	30.9	33.0
2-Yr	51.5	11.1	46.3	37.9	40.4
10-Yr	90.4	24.4	102.5	62.6	73.7
25-Yr	108.5	30.7	130.8	70.8	95.4
50-Yr	126.8	37.1	160.1	76.3	118.5
100-Yr	137.7	41.0	178.2	78.5	133.0

Pre-Development Potential Flooding Improvement Amenities

Three actions were identified that have the potential to improve the flooding experienced by the property owners east of Lehigh Valley trail along Crittenden Road.

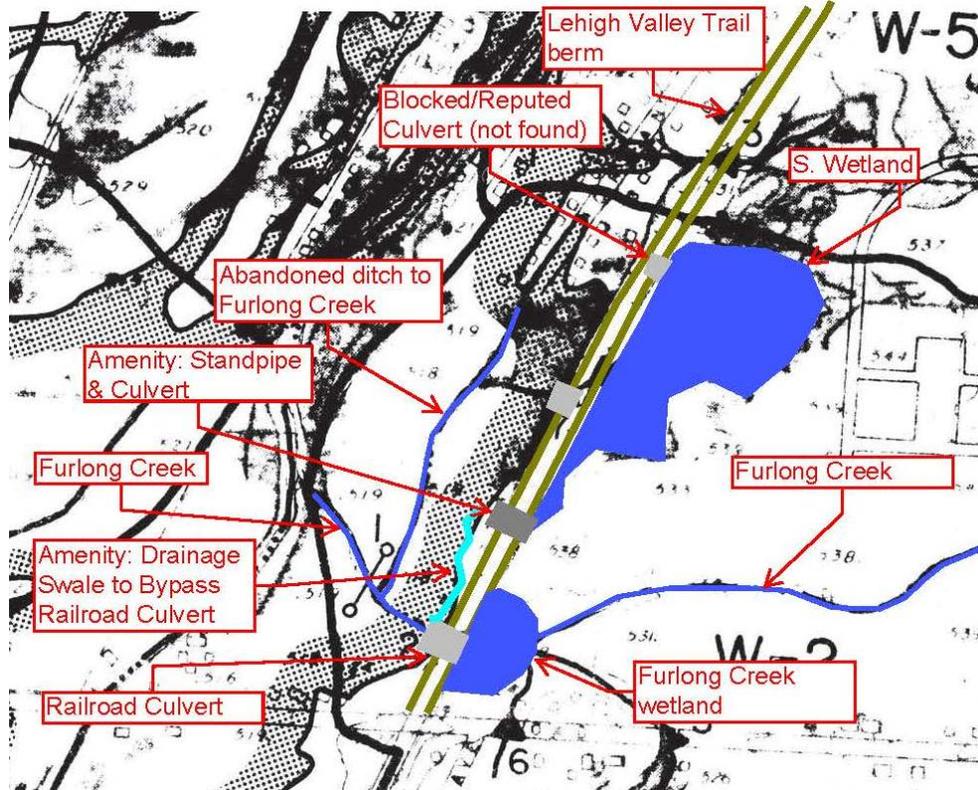
- The first amenity is to redirect runoff from the developed portion of the University of Rochester property that currently drains to the Furlong Creek watershed. A connection can be made in the storm sewer system that will re-route this runoff to the south wetland. This will remove 2.65 acres from the Furlong Creek watershed east of the Lehigh Valley trail where ponding is experienced. Refer to Figure 9.4 for the first amenity location.

Figure 9.4 – New Storm Sewer Connection



- The second amenity is to close the swale that connects the South Wetland to the Furlong Creek watershed by creating a berm in it. This will raise the elevation for ponding in the South Wetlands by 2.4 ft prior to it overflowing the ridge into the Furlong Creek watershed. Refer to the berm modification drawing in Appendix A.
- The third amenity is to construct an outlet structure in the South Wetland to control the ponding elevation thus reducing the potential for it to overtop the ridge and enter the Furlong Creek watershed. The outlet structure will consist of a stand pipe with a top elevation at the proposed conditions 100-year ponding elevation. The stand pipe will discharge through a culvert under the Lehigh Valley Trail. It will be equipped with perforations to allow a minimal amount of discharge which will cause the wetland to slowly return to a base water surface elevation between storm events. A defined drainage channel can be constructed on the west side of the trail berm to direct runoff towards Furlong Creek where the sheet flow currently reaches the residential properties. This amenity will help to redirect some of the flooding volume around the existing railroad culvert. Refer to Appendix A for a detail of the outlet structure. Refer to Figure 9.5 for a diagram of the South Wetland discharge.

Figure 9.5 – South Wetland Discharge



These amenities have the potential to assist in reducing flooding by redirecting some of the flooding volume. However; Furlong Creek has a large upstream drainage area consisting of dense natural vegetation and relatively flat topography. Only a small portion of this drainage area resides on the U of R south campus. The proposed amenities on the U of R property will provide some improvement from existing conditions however, the majority of the flow to Furlong Creek comes from off-site areas to the east and south of Crittenden Road that are not in the rezone area. Implementation of amenity measures will result in only undeveloped areas on the U of R property contributing runoff to this drainage area. The results of the amenities on the Furlong Creek drainage area are shown in the tables below.

Table 9.3 - Existing Ponding Elevations & Volumes after Amenities Inclusion

Storm Event	S. Wetland Elev. (ft)*	S. Wetland Vol. (Ac-ft)	Furlong Creek Wetland Elev. (ft)	Furlong Creek Wetland Vol. (Ac-ft)
1-Yr	526.0	3.3	520.8 (-0.2')	5.7 (-0.6)
2-Yr	526.2	4.2	521.0 (-0.3')	6.3 (-0.9)
10-Yr	526.6	7.6	522.0 (-0.6')	9.9 (-2.5)
25-Yr	526.7	9.2	522.5 (-0.7')	12.1 (-3.3)
50-Yr	526.9	10.6	523.1 (-0.5')	14.6 (-4.5)
100-Yr	527.0	11.5	523.3 (-0.5')	16.0 (-5.4)

*Wetland discharge at standpipe elevation (527.0).

Table 9.4 - Existing Runoff Rates After Amenities Inclusion

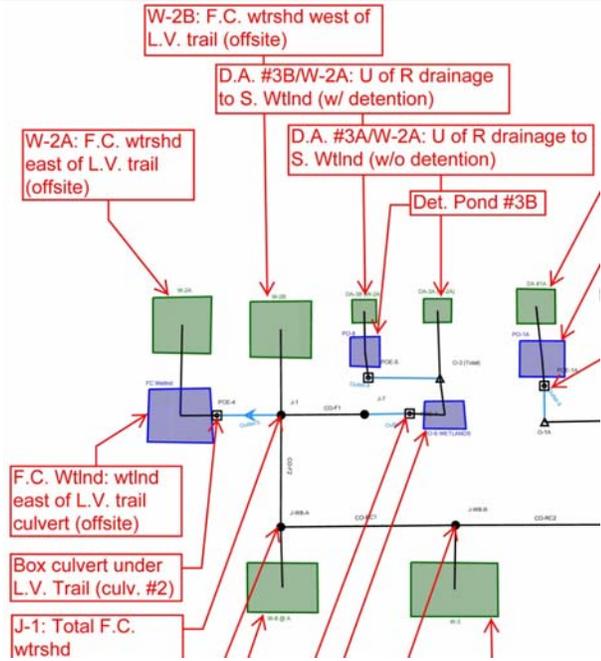
Storm Event	D.A. #3 to S. Wetland (cfs)	S. Wetland to Furlong Creek Wetland (cfs)	W-2A to Furlong Creek Wetland (cfs)	Furlong Creek Wetland culvert discharge (Culv. #2) (cfs)	Total Furlong Creek watershed (cfs)
1-Yr	44.3 (+2.9)	0 (-8.1)	30.1 (-3.4)	22.3 (-8.6)	24.4 (-8.6)
2-Yr	55.1 (+3.6)	0 (-11.1)	42.0 (-4.3)	30.7 (-7.2)	33.4 (-7.0)
10-Yr	96.7 (+6.3)	0 (-24.4)	95.8 (-6.7)	52.9 (-9.7)	70.3 (-3.4)
25-Yr	116.1 (+7.6)	0 (-30.7)	123.1 (-7.7)	61.5 (-9.3)	90.7 (-4.7)
50-Yr	135.7 (+8.9)	0 (-37.1)	151.6 (-8.5)	69.2 (-7.1)	112.3 (-6.2)
100-Yr	147.4 (+9.7)	0 (-41.0)	169.1 (-9.1)	72.0 (-6.5)	125.8 (-7.2)

There will be a reduction both in runoff rate and volume to the Furlong Creek wetland area on the east side of the culvert and from the Furlong Creek culvert to the drainage area on the west side of the trail berm. Drainage Area #3 will receive significantly more runoff volume at a slightly higher rate. The amenities allow this area to contain the volume and release it slowly over time so the contribution during the storm and ponding event will be negligible.

Further mitigation would be provided with the post-development stormwater management conditions by again reducing the drainage area to Furlong Creek east of the culvert. This would result in a 5% reduction in the pre-development runoff rate for the 100-yr storm event and a 25% reduction in the pre-development runoff volume from existing conditions. The proposed mitigation measures will help to reduce some of the flow, but the flooding in low-lying areas will persist during wet periods due to the fact that the runoff from the U of R is only a small contributor to this volume in relation to the offsite drainage area. Additional storage will be provided in Drainage Area #3 to reduce flow rates into the South Wetlands back to existing conditions.

Refer to Figure 9.6 for the proposed condition schematic model used in Pondpac.

Figure 9.6 – Proposed Condition Pondpac Schematic for Furlong Creek



The results of the post-development conditions on the South Wetland and Furlong Creek drainage areas are shown in Table 9.5.

Table 9.5 - Proposed Ponding Elevations & Volumes

Storm Event	S. Wetland Elev. (ft)	S. Wetland Vol. (Ac-ft)	Furlong Creek Wetland Elev. (ft)	Furlong Creek Wetland Vol. (Ac-ft)
1-Yr	526.3 (+0.6)	2.7 (+1.5)	520.8 (-0.2)	5.7 (-0.6)
2-Yr	526.4 (+0.6)	3.3 (+1.7)	521.0 (-0.3)	6.3 (-0.9)
10-Yr	526.7 (+0.8)	5.5 (+2.9)	522.0 (-0.6)	9.7 (-2.7)
25-Yr	526.9 (+0.9)	7.4 (+4.2)	522.5 (-0.7)	11.8 (-3.5)
50-Yr	527.1 (+1.0)	9.3 (+5.4)	523.0 (-0.6)	14.1 (-4.9)
100-Yr	527.2 (+1.1)	10.6 (+6.3)	523.2 (-0.6)	15.4 (-5.6)

*Does not surmount ridge line (527.2') or Lehigh Valley Trail berm (527.3').

Table 9.6 - Proposed Runoff Rates

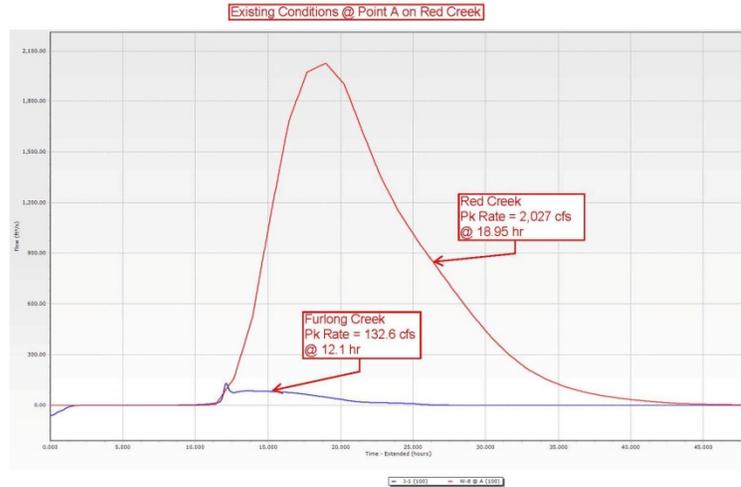
Storm Event	D.A. #3 to S. Wetland (cfs) (#3A + #3B)	S. Wetland to Furlong Creek Wetland (cfs)	W-2A to Furlong Creek Wetland (cfs)	Furlong Creek Wetland culvert discharge (Culv. #2) (cfs)	Total Furlong Creek watershed (cfs)
1-Yr	27.4 (-14.0)	0 (-8.1)	30.6 (-2.9)	22.6 (-8.3)	24.7 (-8.3)
2-Yr	33.5 (-18.0)	0 (-11.1)	42.3 (-4.0)	30.8 (-7.1)	33.5 (-6.9)
10-Yr	56.7 (-33.7)	0 (-24.4)	93.6 (-8.9)	52.0 (-10.6)	70.7 (-3.0)
25-Yr	67.3 (-41.2)	0 (-30.7)	119.4 (-11.4)	60.3 (-10.5)	91.0 (-4.4)
50-Yr	78.0 (-48.8)	0 (-37.1)	146.2 (-13.9)	67.7 (-8.6)	112.5 (-6.0)
100-Yr	84.4 (-53.3)	0 (-41.0)	162.6 (-15.6)	70.9 (-7.6)	125.9 (-7.1)

There will be a reduction both in runoff rate and volume to the Furlong Creek wetland area on the east side of the culvert and from the Furlong Creek culvert to the drainage area on the west side of the trail berm. Drainage Area #3 will receive significantly more runoff volume. Detention volume is provided to account for this increase. An outlet structure from the detention facility will attenuate runoff rates to the south wetlands to at or below pre-developed conditions. The proposed design allows this area to contain the volume and release it slowly over time so the contribution during the storm and ponding event will be negligible.

Downstream Analysis

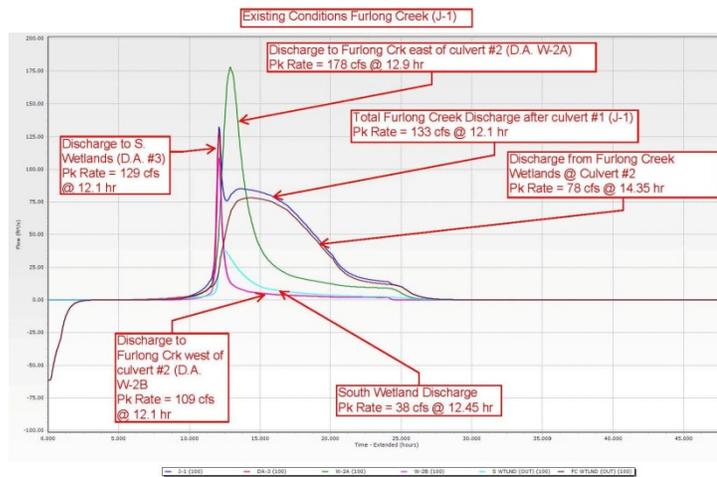
In order to ensure that the hydrologic changes designed for the Furlong Creek watershed will not exasperate flooding concerns the timing of the hydrographs was also looked at in relation to Red Creek. As the hydrograph in Figure 9.7 & 9.8 show, the peak flooding from the Furlong Creek watershed occurs before the peak from the Red Creek watershed. This allows some of the Furlong Creek flooding volume to store in areas that would otherwise be used by Red Creek.

Figure 9.7 – Existing Conditions @ Pt. A on Red Creek



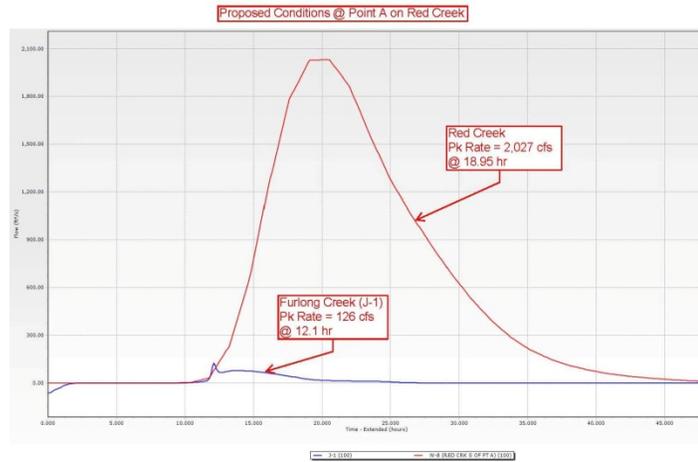
The breakdown of the Furlong Creek hydrograph shows the South Wetland area peaks before the Furlong Creek watershed peak.

Figure 9.8 – Furlong Creek Drainage Area



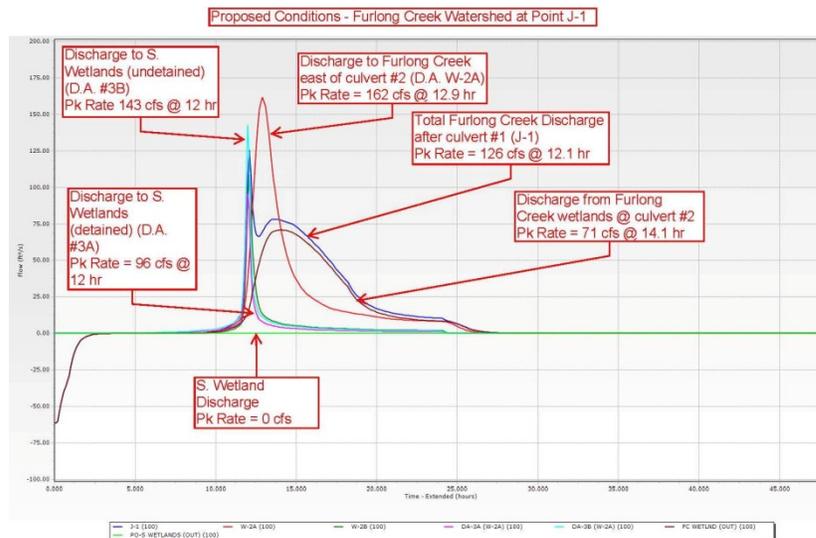
The proposed conditions timing of the Furlong Creek hydrograph in relation to the peak Red Creek hydrograph is not changed. The peak runoff rate is slightly less as a result of the mitigation and amenities.

Figure 9.9 – Proposed Conditions at Point A on Red Creek



The reason the timing has not changed is because the Furlong Creek drainage area is so large compared to the amount of it that is on the University of Rochester site. Below is the breakdown of the proposed Furlong Creek hydrograph.

Figure 9.10 – Furlong Creek Watershed



The second problem area is downstream of the project along the Red Creek tributary. Flooding is experienced by residential property owners west of the Lehigh Valley Trail embankment. The post-development drainage to the Red Creek tributary will have a 83% reduction in the pre-development runoff rate for the 100-yr storm event and a 64% reduction in the pre-development runoff volume.

The U of R re-zone development with stormwater practices and mitigation measures in place will improve downstream conditions and help to reduce flooding.

10. Point #5: Pre- vs. Post-Development Groundwater Recharge

Portions of the project are considered “new development” because impervious surfaces are proposed on what is currently pervious land. This type of surface cover change could result in a decrease of localized groundwater recharge and increase in offsite runoff volume, particularly if the runoff from the impervious surface is collected and channeled to a basin. The project has incorporated many green practices which encourage infiltration of runoff. The five step Green Infrastructure process outlined in the New York State Stormwater Management Design Manual (NYS SMDM) was followed.

Step #1: Avoid or minimize land disturbance by preserving natural areas.

-This was done through careful planning and documentation of critical environmental areas. Critical environmental areas on the site include wetlands, wetland buffers, old growth forest, and significant trees.

Step #2: Determine Water Quality Treatment Volume (WQv).

-This was completed for each of the drainage areas with existing or proposed development (impervious surfaces): D.A. #1A, #2A, #2B, #2D, #2E, #3B. These results are provided in section 10 & 11 and detailed calculations are provided in Appendix D.

Step #3: Reduce the WQv through RRV practices.

-This requirement has been met through the use of bioretention facilities. Detailed discussions of these practices and other alternatives along with the results of the bioretention design are provided in section 10 and detailed calculations are provided in Appendix D.

Step #4: Apply Stormwater Management Practices to Address Remaining WQv.

-This requirement is met through the use of pretreatment forebays, vegetated swales and filtration devices approved for new development. The results of the calculations are provided in section 10 & 11 and details are provided in Appendix D.

Step #5: Apply volume and peak rate control practices if still need to meet requirements.

-This requirement is generally not applicable. The drainage areas to the natural watercourses that receive discharge from the site have been reduced such to reduce the runoff volume and rate. This criteria does not apply to 5th order or larger waterbodies such as the Erie Canal. Detention volume has been provided in the drainage with no outlet to ensure this area has enough storage volume available for additional runoff volume. Detention volume has also been provided in the drainage areas to the Erie Canal to attenuate post-development runoff rates to pre-developed conditions to meet the NYSDOT requirements and release runoff at a rate that downstream storm sewer system has capacity to handle. The results of the detention design are presented in section 6 and detailed calculations are provided in Appendix D.

Refer to Table 10.1 for a summary of the required RRV and Appendix D for detailed calculations.

Table 10.1 – Summary of Runoff Reduction Volume (RRv)

Drainage Area	Area (Ac)	New Imp. Area (Ac)	WQv (Ac-ft)	HSG	Min. Req'd RRv (Ac-ft)	Prov'd RRv (Ac-ft)*
Subarea #2A	18.0	6.6	0.5	D	0.08	0.23
Subarea #2B	41.0	22.6	1.5		0.29	0.60
Subarea #2D	5.7	2.6	0.2		0.03	0.10
Subarea #2E	4.3	2.3	0.2		0.03	0.07
Subarea #3	33.3	9.5	0.7		0.12	0.40
Total	102.3	43.6	3.1	-	0.55	1.40

*Refer to tables 10.2-10.6 for details on how the RRv is provided. Refer to Appendix D for detailed WQv and RRv calculations.

The green practices for the proposed development area are: bioretention facilities. Refer to section 10a for a detailed description of the green practices that are proposed.

Table 10.2: Drainage Area #2A – Runoff Reduction Volume Summary

Practice	Contributing Drainage Area (Ac)	Contributing Impervious Area (Ac)	Req'd Runoff Red. Vol. (Ac-ft)
Bioretention	13.85	8.87	0.08
Total Runoff Reduction Volume Provided:			0.23 Ac-ft
Total WQv to be Provided with a Standard Practice:			0.23 Ac-ft

Table 10.3: Drainage Area #2B – Runoff Reduction Volume Summary

Practice	Contributing Drainage Area (Ac)	Contributing Impervious Area (Ac)	Req'd Runoff Red. Vol. (Ac-ft)
Bioretention	30.9	23.3	0.29
Total Runoff Reduction Volume Provided:			0.60 Ac-ft
Total WQv to be Provided with a Standard Practice:			0.89 Ac-ft

Table 10.4: Drainage Area #2D – Runoff Reduction Volume Summary

Practice	Contributing Drainage Area (Ac)	Contributing Impervious Area (Ac)	Req'd Runoff Red. Vol. (Ac-ft)
Bioretention	5.7	3.8	0.03
Total Runoff Reduction Volume Provided:			0.10
Total WQv to be Provided with a Standard Practice:			0.07 Ac-ft

Table 10.5: Drainage Area #2E – Runoff Reduction Volume Summary

Practice	Contributing Drainage Area (Ac)	Contributing Impervious Area (Ac)	Req'd Runoff Red. Vol. (Ac-ft)
Bioretention	4.3	2.7	0.03
Total Runoff Reduction Volume Provided:			0.07
Total WQv to be Provided with a Standard Practice:			0.08 Ac-ft

Table 10.6: Drainage Area #3 – Runoff Reduction Volume Summary

Practice	Contributing Drainage Area (Ac)	Contributing Impervious Area (Ac)	Req'd Runoff Red. Vol. (Ac-ft)
Bioretention	32.4	15.0	0.12
Total Runoff Reduction Volume Provided:			0.40
Total WQv to be Provided with a Standard Practice:			0.28 Ac-ft

For each of the drainage areas, the provided RRv exceeds the minimum required RRv. This meets the NYS SMDM requirements and helps reduce runoff volume from the developed site.

10a. Green Practices

Bioretention Facilities

Five (5) bioretention facilities designated as Bio #2A, #2B, #2D, #2E, & #3 are proposed at the site. Refer to Figures C-E in Appendix A for the bioretention locations. These are depression areas with wetland plantings and underdrain designed to promote infiltration. The systems have been designed offline. A diversion structure will direct the WQv to the facility and the remainder of the runoff to a runoff rate attenuation practice. Bioretention system #2D provides pretreatment in the form of a vegetated swale and bioretention systems #2A, #2B, #2E & #3 provide pretreatment in the form of forebays. Refer to detailed calculations in Appendix D for design of the swales and Table 10.6 for a design summary.

Table 10.7 – Bioretention Facility Summary

Bio Design	Bio #2A	Bio #2B	Bio #2D	Bio #2E	Bio #3
System Inv (ft)	532.5	532.0	533.0	528.0	533.5
Max Ponding (in)	12	12	12	12	12
Total Depth (in)	24	24	24	24	24
Side slopes (h:v)	3:1	3:1	3:1	3:1	3:1
Volume (Ac-ft)	0.14	0.45	1.18	0.19	0.76
Planting Soil Depth (ft)	2.5	2.5	2.5	2.5	2.5
Gravel Depth (in)	8	8	8	8	8

Tree Planting & Preservation

RRv credit is given for certain existing trees on the site that are maintained and trees planted as a part of the project. To achieve credit the trees must be a certain caliber and native to the area. The U of R site is composed of wooded areas with some of these areas have significant old growth trees that would qualify for this credit. At this time it is also not possible to speculate the quantity of proposed trees that would qualify. Therefore, this report conservatively excludes any credit given for trees at this time. As specific projects are proposed they may evaluate the applicability of the credit and further exceed the RRv quantity stated in this report.

Disconnected Impervious Area

This practice “disconnects” rooftop downspouts from the storm sewer system and directs them to a filter strip designed to promote infiltration. These practices are favorable because generally rooftop runoff is relatively free of pollutants and ideal to recharge back into the environment. The filter strip requires a longitudinal area at least equal to the drainage length of the rooftop constructed at a minimal slope. The practice should drain to an area capable of receiving runoff. This practice was not incorporated into the re-zone stormwater management plan because all rooftop runoff has already been directed to bioretention systems. The goal in developing the

stormwater management plan was to concentrate the infiltration practices into regions so they could be reserved from development and easily monitored and maintained once constructed. This also leaves additional options for the final design to comply with the green development requirements.

Dry Swales

Dry swales are vegetated swales that promote infiltration through a gradual longitudinal slope and wide bottom. They are constructed with engineered soils conducive to infiltration and an underdrain. Dry swales are most appropriate in areas with low groundwater elevations as they require a separation from the groundwater table. This practice was not incorporated into the re-zone stormwater management plan because all the development runoff is already being directed to bioretention systems. Dry swales may be appropriate to use as an additional treatment measure along roads or parking areas in place of a closed conduit system. A goal in developing the stormwater management plan was to preserve all trees of value. Many of these trees are located in and around the development. Swales were avoided to limit disturbance around these trees and to their roots. This also leaves additional options for the final design to comply with the green practices requirements should the tree disturbance be determined not to be a detrimental impact in certain locations.

Vegetated Swales

One (1) vegetated swales designated is proposed as a pretreatment measure in drainage area #2D. Vegetated swales are turf or plant lined swales designed to convey stormwater at a low velocity, promoting infiltration. These types of swales are acceptable as either green practices or pretreatment measures. They do not contain the engineered soils provided in dry swales to assist in infiltration and therefore do not have the same infiltration potential. As a result the RRv they provide is not adequate as a solitary measure. The swale will provide some RRv however credit was not taken for their treatment as it was alternatively applied to the secondary measure (bio#2D) in the same drainage area. Additional vegetated swales may be appropriate to use as an additional treatment measure along roads or parking areas in place of a closed conduit system. A goal in developing the stormwater management plan was to preserve all trees of value. Many of these trees are located in and around the development. Swales were avoided to limit disturbance around these trees and to their roots. This also leaves additional options for the final design to comply with the green practices requirements should the tree disturbance be determined not to be a detrimental impact in certain locations.

Alternative Practices/Runoff Reuse

Capturing runoff volume and reusing it for non-potable uses is an excellent practice to reduce both runoff volume off-site and potable water usage. The U of R is open to exploring the possibility of employing this technology during the final design stages. At this point in the conceptual design, it would only speculation as to the amount of runoff volume which could be repurposed. Other measures such as green roofs, planters or pervious pavement may also be considered in final design; however, to ensure adequate land is available for stormwater management, these practices were conservatively excluded from consideration. This also leaves additional options for the final design to comply with the green practices requirements.

According to Chapter 4 of the New York State Design Manual, projects that cannot meet 100% of the runoff reduction requirement must provide a justification why each of the green practices in Chapter 5 of the NYSDM are not technically feasible. The following green practices were evaluated and determined not to be feasible in meeting the full runoff reduction requirement.

Green Practice	Comment
Preservation of Undisturbed Areas	Portions of the site, including the most critical environmental areas has already been left undisturbed. This includes many of the significant trees.
Preservation of Buffers	Naturally occurring buffers on the site have already been left undisturbed and are protected by development.
Reduction of Clearing and Grading	Clearing and grading has been already been reduced to the minimum extent practical.
Locating Development in Less Sensitive Area	A considerable amount of planning has been put into locating development in less sensitive areas which will allow wetlands, buffers, significant trees and woodlots to remain protected from development.
Open Space Design	Open space design practices have already been applied. Development is clustered into areas to allow large portions of the site with critical environmental features to be left undeveloped.
Soil Restoration	Soil restoration will be proposed in areas that are designed to provide infiltration. Remaining lawn areas will have plantings to increase the infiltration capacity of the soils.
Roadway Reduction	The roadway has been reduced to the maximum extent possible.
Sidewalk Reduction	Sidewalks have been reduced to the maximum extent possible.
Driveway Reduction	The Driveway widths have been reduced to the maximum extent possible.
Cul-de-sac Reduction	Not applicable – cul-de-sac's are not proposed.
Building Footprint Reduction	The building footprints have already been reduced to the maximum extent possible.
Parking Area Reduction	The parking areas have already been reduced to the maximum extent possible.
Conservation of Natural Areas	Portions of the site, including the most critical environmental areas has already been left undisturbed. These areas are already protected from development by the wetland & wetland buffer classification.
Sheetflow to Riparian Buffers or Filter Strips	Discussed above under Disconnected Rooftop Runoff section.
Vegetated Swale	Discussed above under Vegetated Swale section.
Tree Planting/Tree Pit	Discussed above under Tree Planting/Tree Preservation section.
Stream Daylighting	Not applicable
Rain Gardens	Not applicable, there areas are already being attributed to an alternative green practice and this practice cannot handle the rooftop runoff generated from the proposed buildings.
Green Roofs	Roof top runoff is already being attributed to an alternative green practice. This practice may be considered as an alternative during final design.
Stormwater Planters	Rooftop runoff is already being attributed to an

	alternative green practice. This practice may be considered as an alternative during final design.
Rain Barrels and Cisterns	Discussed above under cisterns/Runoff Reuse section.
Porous Pavement	Parking lot runoff is already being directed to an alternative green practice. This practice may be considered as an alternative during final design.

The design complies with the NYSDEC Green Design requirements applicable to new development.

11. Point #6: Pre- vs. Post-Development Pollutant Discharge

Development involving increasing impervious area and conversion of wooded areas to lawn areas has the potential to increase pollutant discharge, particularly total suspended solids (TSS) and total phosphorus (TP). The highest concentration of pollutants present in stormwater occurs during the lower intensity rainfall events, more specifically in approximately the first 1/2-inch of run-off. This runoff is calculated as the Water Quality Volume (WQv). Pollutant discharge is mitigated through practices which temporarily hold this volume to allow for infiltration or settling of pollutants. For new development, WQv should be provided so that 80% removal of the annual TSS and 40% TP is achieved. For new development areas, WQv should be provided in the form of Runoff Reduction Volume (RRv) and/or WQv provided as a standard practice. For redevelopment areas, a percentage of the calculated WQv should be provided in either a standard (25% of WQv) or alternative (75% of WQv) practice. The proposed developments are a combination of new development and redevelopment. For new development areas, a percentage of the required WQv has been provided as RRv. The remaining required water quality volume for new development was added to the redevelopment water quality volume for an overall required WQv to be provided with a standard practice. This volume will be provided in the stormwater ponds which will be “undercut” with deep pools to retain 100% of the water quality volume. The water quality criteria will be achieved by providing these “deep pool” areas at the inlet and outlet to the stormwater pond. These measures along with meeting the standard design practices as included in the New York State Stormwater Management Design Manual will provide for adequate TSS and Phosphorus removal. Refer to Table 11.1 for a summary of the WQv calculations and Appendix D for detailed calculations.

Table 11.1 – Water Quality Volume Summary

Drainage Area	Req'r'd WQv from New Development* (Ac-ft)	Req'r'd WQv from Redevelopment (Ac-ft)	Req'r'd WQv for Bioretention Pretreatment (Ac-ft)	Total Required WQv (Ac-ft)	Provided WQv (Ac-ft)
Subarea #1A	-	0.06	-	0.06	0.96
Subarea #2A	0.27	0.09	0.32	0.68	0.68
Subarea #2B	0.89	0.14	1.00	2.03	2.38
Subarea #2D	0.07	0.02	0.12	0.21	0.21
Subarea #2E	0.08	0.01	0.05	0.14	0.56
Subarea #3B	0.28	0.15	0.42	0.85	0.91

*Total required WQv minus RRv provided, see section 10.

Using green and/or standard practices sized to the WQv requirements in the NYS SMDM is generally accepted as meeting the required TSS and TP removal. This can be verified with further analysis using the 'Simple Method' (Schueler, 1987) in the NYS SMDM. This method applied a pollutant loading to each cover delineation and a removal rate to each practice. Refer to Table 11.2 for a summary of the pollutant loading using the Simple Method and Appendix D for detailed calculations.

Table 11.2 –Annual Runoff for Pollutant Loading Contribution (in)

Drainage Area	% Impervious			Annual Runoff (in)		
	Exist. D.A.	Prop. D.A.	D.A. to Practice	Exist. D.A.	Prop. D.A.	D.A. to Practice
D.A. #1	15%	15%	61%	26	28	110
D.A. #2	21%	61%	71%	37	110	126
D.A. #3	21%	32%	55%	38	58	98
D.A. #4	4%	0%	0%	7	0	0

Table 11.3 – Pollutant Removal Practices and Net Efficiency Removal Rate

Drainage Area	Pollutant Removal Practices	Net Poll. Removal Efficiency Rate*	
		TSS	TP
D.A. #1	Bioretention & Det. Pond	97%	80%
D.A. #2	Veg. Swale, Bioret. & Det. Pond	100%	88%
D.A. #3	Veg. Swale, Bioret. & Det. Pond	100%	100%
D.A. #4	Reduction of Drainage Area and removal of all impervious area in D.A.	-	-

*Refer to Table 11.7 for separate practice removal rate efficiencies.

Table 11.4 – TSS Comparison of Pre- & Post Construction Pollutant Loading

Drainage Area	Existing Pollutant Loading (mg/l)	Proposed Pollutant Loading (Pre-WQv practices (mg/l)	Increase in Pollutant Loading Post-Development (Pre-WQv practices)	Pollutant Removal from WQv Practices (mg/l)	Proposed Pollutant Loading (Post-WQv Practice) (mg/l)	Decrease in Pollutant Loading Post-Development (Post WQv practice)
D.A. #1	2,389,176	1,824,114	-24%	108,665	1,715,449	28%
D.A. #2	11,226,382	27,431,946	+59%	13,250,243	14,181,703	-26%
D.A. #3	1,693,944	7,222,342	+77%	6,819,166	403,177	76%
D.A. #4	51,737	0	-100%	0	0	100%

Table 11.5 – TP Comparison of Pre- & Post Construction Pollutant Loading

Drainage Area	Existing Pollutant Loading (mg/l)	Proposed Pollutant Loading (Pre-WQv practices (mg/l)	Increase in Pollutant Loading Post-Development (Pre-WQv practices)	Pollutant Removal from WQv Practices (mg/l)	Proposed Pollutant Loading (Post-WQv Practice) (mg/l)	Decrease in Pollutant Loading Post-Development (Post WQv practice)
D.A. #1	8,496	6,594	-22%	457	6,137	28%
D.A. #2	40,426	95,988	+58%	40,481	55,506	-37%
D.A. #3	6,211	26,268	+76%	26,107	161	97%
D.A. #4	301	0	-100%	0	0	100%

Table 11.6 – Pollutant Loading Per Cover Delineation

Cover Delineation	-	Roof	Street	Lawn	Pkg	Wds/Mdw	Water
Pollutant Conc. (C) (mg/l)**	TSS	9.00	468.0	602.0	27.0	3	2
	TP	0.14	0.00	2.10	0.15	0.10	0.10

**From Appendix A of the NYS SMDM.

Table 11.7 – BMP Pollutant Removal Rate

Practice	Type of Prac.	% TSS Removal**	% TP Removal**
Pretreat. Veg. Swale	Filtering	85	40
Bioretention	Filtering	85	60
Pond	Pond	80	50

** From Table A.5 of SMDM.

The project will result in a higher pollutant loading rate as a result of the increase in development. After the post-constructions stormwater management best management practices (BMP's) are considered, though the project will result in a decrease pollutant loading rate to natural receiving systems.

12. Conclusion

The six main points of concern for the proposed development will each be effectively mitigated to industry and regulatory standards and will match or be more beneficial than existing conditions.

- 1.Pre- vs. Post-Development Peak Runoff Rate – Will be attenuated to at or below existing conditions in compliance with the General Permit and the Town of Brighton's design standards.
- 2.Post-Development Project Impacts Downstream – Will provide positive reduction to downstream peak runoff rates and volumes to natural water courses and result in negligible changes to downstream peak runoff rates to man-made or no-outlet water courses from existing conditions.
- 3.Pre- vs. Post-Development Peak Runoff Volume – Will provide positive reduction to runoff volumes to natural water courses and will not have detrimental impacts to man-made or no-outlet water courses.

4. Post Development Project Impacts to Existing Flooding Problem Areas – Will produce some minor improvements to current flooding conditions in problem areas.
5. Pre- vs. Post-Development Groundwater Recharge – Will result in negligible changes to groundwater recharge conditions as a result of infiltration practices.
6. Pre- vs. Post-Development Pollutant discharge – Will result in decrease in pollutant loading to receiving systems.

In accordance with SPEDES General Permit GP-0-10-001, a Storm Water Pollution Prevention Plan(s) (SWPPP(s)) must be developed outlining the previously discussed requirements and design guidelines as development occurs within the action area. The SWPPPs shall incorporate design standards from the Town of Brighton Code and the Irondequoit Creek Watershed Collaborative.

APPENDIX B

Tree Survey, Old Growth Habitat Report



Woodlot Quality Assessment

**University of Rochester South Campus Property
Town of Brighton, New York**

Prepared for:
Dennis Kennelly, P.E.
T.Y. Lin International
255 East Avenue
Rochester, NY 14604

Prepared by:
Christopher J. Luley, Ph. D. &
Andrew Pleninger

December 2013

Urban Forestry, LLC
www.urbanforestryllc.com



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Introduction

Urban Forestry, LLC was retained by T. Y. Lin International to complete a statistical sampling of trees located on property owned by the University of Rochester in the Town of Brighton, NY. The objective was to provide a statistically valid measure of the numbers of trees, tree diameter or size, tree species and quality present in the development area. The location of the development boundaries were identified by T. Y. Lin International for use in a site development plan request being presented to the Town of Brighton.

Sample Methodology

The survey was done using USDA Forest Services Urban Forest Effects (UFORE) sampling protocols (Nowak and Crane, 2000; itree.org). Field survey work was conducted on December 9 and 10, 2013.

The sample plot locations utilized in a 2005 Woodlot Quality sample (completed by Urban Forestry, LLC) were re-sampled for the current survey (See Appendix A). These samples plots were located using the plot centers established using geographic positioning system (GPS) coordinates from the 2005 survey. The plots were randomly located in 2005 in areas called "Pods" at a rate of approximately one 1/20th acre plot per forested acre. For the current survey, 38 plots were re-sampled over the 34 acre development area. Only sample plots that were primarily in forested locations and fell within the development area were re-sampled.

Plot centers were navigated to using Trimble GEO-XH GPS units. The units allowed navigation to within 3-5 feet of the original plot center. Within each plot, each tree with a minimum diameter of 5 inches at breast height (4 ½ feet above grade) was measured and evaluated for:

1. Tree Genus and Species
2. Diameter at Breast Height (4 ½ feet above grade) measured with a diameter tape, and
3. Condition
 - a. Good
 - b. Fair
 - c. Poor
 - d. Very Poor
 - e. Dead

Sample Data Results

Sample plot data was used to make estimates of the total for number of trees in development area, size class distribution (Table 1), tree species composition (Table 2) and overall tree condition (Table 3). These data are presented with standard errors estimated from the plot sample variation. Standard errors reported in this project were found similar in ranges to those reported by Nowak et al. 2002.

Total Tree Population Estimate: 5,279
 Standard Error of the Mean (SEM) = 464 trees

Table 1. Size class distribution of trees sampled

Size Class Inches	Total	SEM
5 to 9	2,487	310
10 to 14	1,593	165
15 to 19	501	75
20 to 24	465	98
25 to 29	125	99
30+	107	102

Table 2. Species composition of trees sampled

Species	Total	SEM
<i>Acer negundo</i> - Boxelder	161	60
<i>Acer saccharinum</i> - Silver Maple	626	248
<i>Acer saccharum</i> - Sugar Maple	161	382
<i>Amelanchier species</i> - Serviceberry Species	18	18
<i>Carpinus betula</i> - European Hornbeam	18	18
<i>Carya cordiformis</i> - Bitternut	36	35
<i>Crataegus sp.</i> - Hawthorn species	89	63
<i>Fagus grandiflora</i> - American Beech	18	18
<i>Fraxinus americana</i> - White Ash	644	199
<i>Fraxinus pennsylvanica</i> - Green Ash	913	285
<i>Juglans nigra</i> - Black Walnut	18	18
<i>Liriodendron tulipifera</i> - Tuliptree	107	107
<i>Malus species</i> - Crabapple Species	89	64
<i>Populus deltoides</i> - Cottonwood	841	379
<i>Populus tremuloides</i> - Quaking Aspen	197	228
<i>Prunus serotina</i> - Black Cherry	358	147
<i>Prunus species</i> - Cherry/Plum Species	18	18
<i>Quercus imbricaria</i> - Shingle Oak	54	78
<i>Quercus macrocarpa</i> - Bur Oak	18	18
<i>Quercus palustris</i> - Pin Oak	143	468
<i>Quercus rubra</i> - Red Oak	143	90
<i>Rhamnus cathartica</i> - Buckthorn	72	156
<i>Salix nigra</i> - Black Willow	18	18
<i>Salix species</i> - Willow species	358	151
<i>Sassafrass albidum</i> - Sassafrass	54	78
<i>Ulmus americana</i> - American Elm	89	64

Table 3. Condition classes of trees sampled

Condition Class	Total	SEM
DEAD	125	45
VERY POOR	394	65
POOR	1,235	209
FAIR	1,933	211
GOOD	1,593	272

Literature Cited

Nowak, D. J., Crane, D. E., Stevens, J. C. and Ibarra, M. 2002. Brooklyn's urban forest. USDA Forest Service, GTE-290. 107 pp.

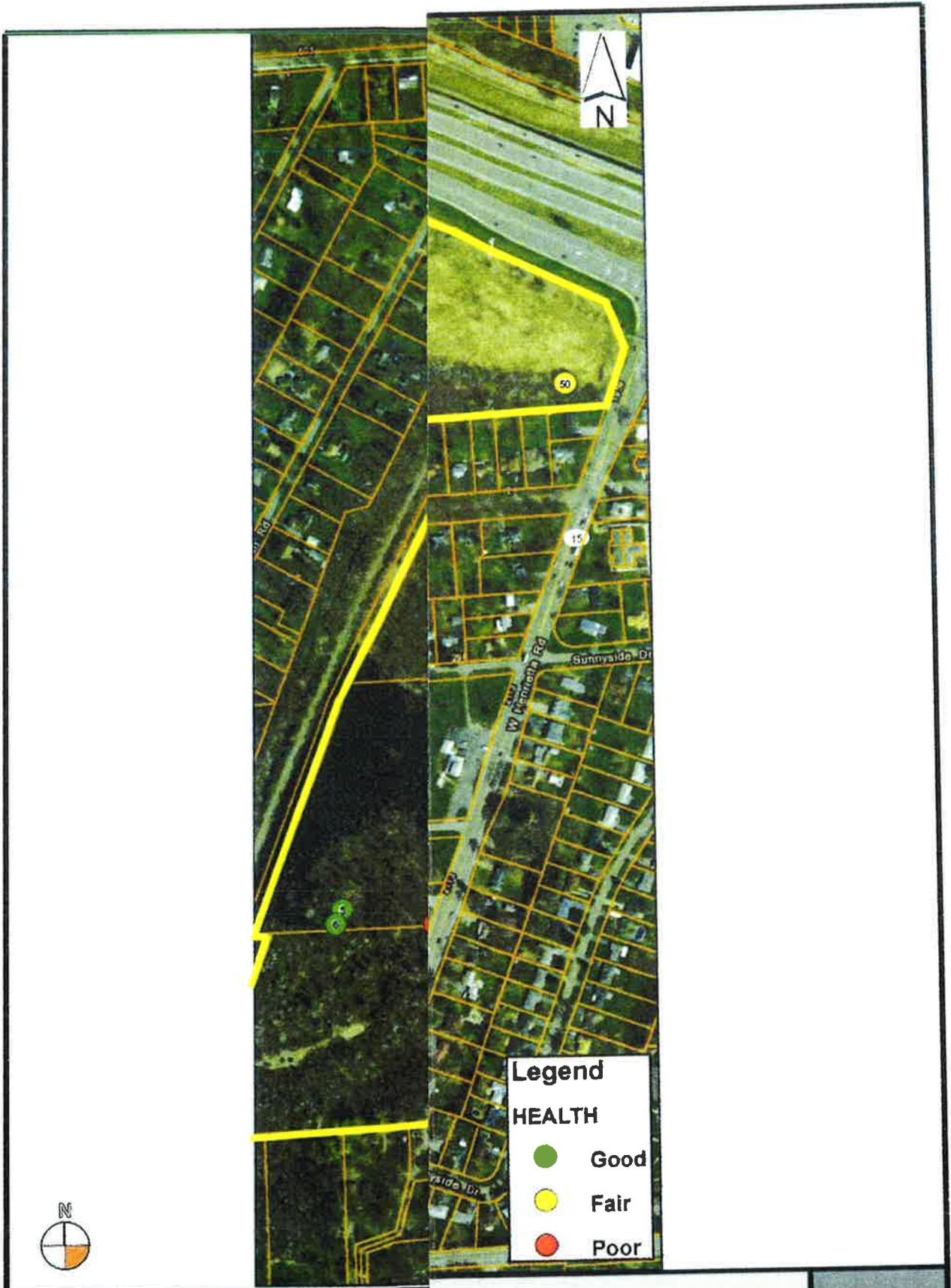
Nowak, D.J. and Crane, D.E. 2000. The urban forest effects (UFORE) model: quantifying urban forest structure and functions. Hansen, Mark; Burk, Thomas, eds. In: Integrated tools for natural resources inventories in the 21st century: proceedings of the IUFRO conference; 1998 August 16-20; Boise, ID. Gen. Tech. Rep. NC-212. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 714-720.

Appendix A – Site Development Area Map

Survey update was conducted within the woodlot area of proposed disturbance



- Woodlot EPOD:
Area = 96.6 Acres
- Developable Area
Within Woodlot EPOD =
42.3 Acres (+/-43%)



ID	SPECIES	DIAMETER (Inch)	HEALTH	STRUCTURE
2	Carya ovata - Shagbark Hickory	41	Good	Fair
3	Quercus palustris - Pin Oak	34	Fair	Fair
4	Prunus serotina - Black Cherry	39	Poor	Poor
5	Acer saccharinum - Silver Mapl	32	Good	Good
6	Acer saccharinum - Silver Mapl	33	Good	Fair
7	Salix nigra - Black Willow	48	Fair	Fair
8	Salix nigra - Black Willow	43	Good	Fair
9	Salix nigra - Black Willow	32	Poor	Poor
10	Fraxinus pennsylvanica - Green	33	Fair	Fair
11	Populus deltoides - Cottonwood	33	Poor	Fair
12	Quercus palustris - Pin Oak	34	Fair	Fair
13	Acer saccharinum - Silver Mapl	34	Fair	Fair
14	Acer saccharinum - Silver Mapl	31	Fair	Fair
15	Acer saccharinum - Silver Mapl	38	Poor	Poor
16	Acer rubrum - Red Maple	32	Good	Fair
17	Quercus rubra - Red Oak	34	Good	Good
18	Acer saccharinum - Silver Mapl	36	Fair	Fair
19	Acer saccharinum - Silver Mapl	37	Good	Good
20	Quercus rubra - Red Oak	33	Good	Good
21	Quercus rubra - Red Oak	30	Good	Good
22	Quercus palustris - Pin Oak	35	Fair	Good
23	Populus deltoides - Cottonwood	35	Fair	Good
24	Acer saccharinum - Silver Mapl	35	Fair	Fair
25	Populus deltoides - Cottonwood	31	Fair	Fair
26	Populus deltoides - Cottonwood	41	Fair	Fair
27	Populus deltoides - Cottonwood	36	Fair	Fair
28	Populus deltoides - Cottonwood	41	Poor	Poor
29	Salix nigra - Black Willow	40	Fair	Fair
30	Quercus rubra - Red Oak	39	Fair	Fair
31	Quercus rubra - Red Oak	33	Fair	Fair
32	Quercus rubra - Red Oak	38	Fair	Good
33	Quercus rubra - Red Oak	30	Fair	Good
34	Acer saccharinum - Silver Mapl	33	Fair	Poor
35	Acer saccharinum - Silver Mapl	36	Good	Fair
36	Acer saccharinum - Silver Mapl	41	Fair	Fair
37	Acer saccharinum - Silver Mapl	39	Fair	Good
38	Fraxinus americana - White Ash	33	Poor	Good
39	Acer saccharinum - Silver Mapl	32	Fair	Fair
40	Quercus alba - White Oak	33	Fair	Poor
41	Fraxinus americana - White Ash	36	Fair	Fair
42	Acer saccharinum - Silver Mapl	42	Fair	Poor
43	Acer saccharinum - Silver Mapl	42	Fair	Fair
44	Quercus palustris - Pin Oak	30	Fair	Good
45	Quercus palustris - Pin Oak	31	Fair	Good
46	Acer saccharinum - Silver Mapl	41	Good	Fair
47	Acer saccharinum - Silver Mapl	37	Good	Fair

48	Populus deltoides - Cottonwood	60	Good	Fair
49	Fraxinus americana - White Ash	32	Fair	Fair
50	Acer negundo - Boxelder	31	Fair	Poor
51	Populus deltoides - Cottonwood	37	Good	Fair
52	Populus deltoides - Cottonwood	32	Fair	Good
53	Fraxinus americana - White Ash	32	Fair	Fair
54	Salix nigra - Black Willow	36	Poor	Poor
55	Quercus palustris - Pin Oak	40	Fair	Fair
56	Populus deltoides - Cottonwood	42	Good	Good
57	Populus deltoides - Cottonwood	38	Good	Good
58	Populus deltoides - Cottonwood	35	Good	Good
59	Acer saccharinum - Silver Mapl	34	Good	Fair
62	Populus deltoides - Cottonwood	34	Good	Good
63	Quercus rubra - Red Oak	53	Fair	Fair
64	Liriodendron tulipifera - Tulip	35	Fair	Fair
65	Acer saccharinum - Silver Mapl	48	Poor	Poor
66	Populus deltoides - Cottonwood	31	Good	Good
67	Quercus rubra - Red Oak	62	Good	Fair
68	Quercus palustris - Pin Oak	53	Good	Fair
69	Quercus palustris - Pin Oak	35	Fair	Fair
70	Quercus palustris - Pin Oak	49	Fair	Fair
71	Fraxinus americana - White Ash	35	Fair	Fair
72	Populus deltoides - Cottonwood	55	Fair	Fair
73	Populus deltoides - Cottonwood	38	Good	Good
74	Ulmus americana - American Elm	33	Good	Fair
75	Populus deltoides - Cottonwood	39	Good	Fair
76	Quercus palustris - Pin Oak	33	Fair	Good
77	Acer saccharinum - Silver Mapl	35	Good	Fair
78	Populus deltoides - Cottonwood	44	Fair	Poor
79	Populus deltoides - Cottonwood	33	Fair	Fair
80	Populus deltoides - Cottonwood	50	Good	Fair
81	Populus deltoides - Cottonwood	44	Fair	Fair
82	Populus deltoides - Cottonwood	33	Good	Good
83	Populus deltoides - Cottonwood	53	Good	Fair
84	Populus deltoides - Cottonwood	40	Good	Fair
85	Populus deltoides - Cottonwood	31	Poor	Fair
86	Populus deltoides - Cottonwood	33	Fair	Fair
87	Populus deltoides - Cottonwood	34	Fair	Fair
88	Populus deltoides - Cottonwood	48	Fair	Fair
89	Populus deltoides - Cottonwood	33	Poor	Fair
90	Populus deltoides - Cottonwood	34	Fair	Fair
91	Populus deltoides - Cottonwood	31	Fair	Fair
92	Quercus palustris - Pin Oak	37	Fair	Poor

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[Rochester Forests](#)

[Teaching](#)
[South Campus](#)

Overview of South Campus Forests

South Campus:

[Overview](#)

[History](#)

[Trails](#)

[Plant communities](#)

[Plant species list](#)

[Herbarium specimens](#)

[Wildlife](#)

[Birds](#)

[Invasive organisms](#)

[Aerial photos \(Whipple Park\)](#)

[Aerial photos \(Crittenden\)](#)

While many New York forests are of recent origin—having developed on abandoned farmland over the past 50-75 years—two stands on/near the University of Rochester South Campus are considerably older. Based on historical photographs and tree coring efforts, we estimate these forests to be >200 years old, predating European settlement of the area. These old-growth areas are located (1) west of the Whipple Park apartments, on property owned by the University of Rochester; and (2) ~1 km south of the Whipple Park apartments, on the far side of Crittenden Road, on property owned by Brighton (the "Lynch Woods"). Each of the forests is approximately 15 acres in size and imbedded in a matrix of younger second-growth forest. The young forest buffers the old-growth from human disturbance and provides corridors for wildlife dispersal. The vast majority of young forest on both sides of Crittenden Road is owned by the University of Rochester.

The biodiversity of the South Campus is remarkable. In recent surveys, the Ramsey lab has documented the occurrence >40 tree and shrub species, including several taxa that are generally uncommon in urban areas of New York (American chestnut, Freeman's maple, black cherry). The forest understory has a rich community of native herbs (mayapple, Jack-in-the-pulpit, trillium, baneberry, meadowrue, Indian pipe, Canada mayflower) and ferns (sensitive, cinnamon, royal). The forest has numerous large trees, with some red oak and tuliptrees achieving diameters of >3 feet and heights of >100 feet. Vernal pools form in shallow depressions through much of the woodlands, providing breeding sites for amphibians. Among terrestrial vertebrates, we have observed white-tailed deer, red foxes, raccoons, tree squirrels, flying squirrels, muskrats, chipmunks, mice, and voles. More than 90 bird species have been observed in the woodlands, including eleven warbler species, five thrushes, seven woodpeckers and seven sparrows.

Despite their ecological diversity, the South Campus faces environmental threats related to anthropogenic disturbance and invasive organisms. For example, the South Campus is crisscrossed by small paths developed by hikers and bike-riders. This impromptu network is difficult to navigate and causes unnecessary trampling of ecologically-sensitive wetlands and wildflower communities. Several areas are heavily impacted by invasive plants, including oriental bittersweet (*Celastrus orbiculatus*, Celastraceae), honeysuckle (*Lonicera* sp., Caprifoliaceae), buckthorn (*Rhamnus cathartica*, Rhamnaceae), and garlic mustard (*Alliaria petiolata*, Brassicaceae). Moreover, development of additional university buildings on parts of the South Campus is inevitable.

The Ramsey lab is working with the [University of Rochester](#), the [Town of Brighton](#), and student conservation groups to characterize the ecology of the South Campus and preserve this natural resource for future generations. If you are interested in participating in these efforts, please [contact us](#). You can learn more about University of Rochester forests by clicking on the web links on the left margin of this page.

Overview

Photographs of UR South Campus. (a) Adam Green and Rob Laport pose next to an American Chestnut. Once a dominant tree of eastern North America, the chestnut was largely extirpated by an introduced fungus. (b) Adam and Rob pose next to a red oak. Some trees in old-growth are large, sometimes exceeding 3 feet in diameter and 100 feet in height. (c) & (d) Undergraduates Margaret Ball, Alison Ossip-Klein, Stephanie Santell, and Tom Brekke compare the composition and structure of canopy trees in old-growth vs. second-growth forest near Whipple Park.

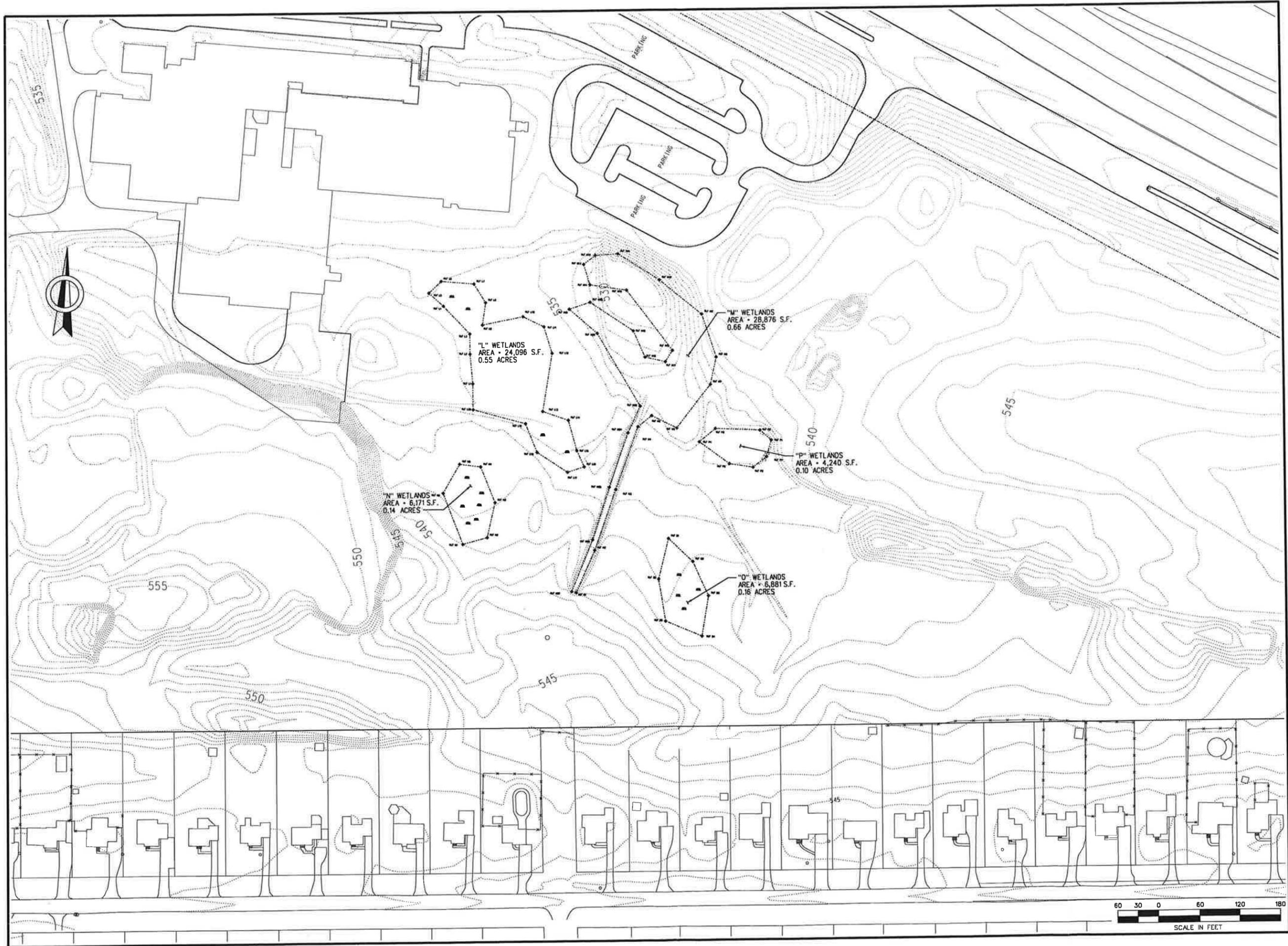


Aerial photographs were obtained from the Geographic Information Systems department of Monroe Co. Student photographs were taken by J. Ramsey and T. Ramsey.

APPENDIX C

Wetland Documentation

- Wetland Delineation Maps
- New York State Department of Environmental Conservation
- Environmental Resources, LLC
- US Army Corps of Engineers



UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF NEW YORK STATE EDUCATION LAW ARTICLE 136, SECTION 1363

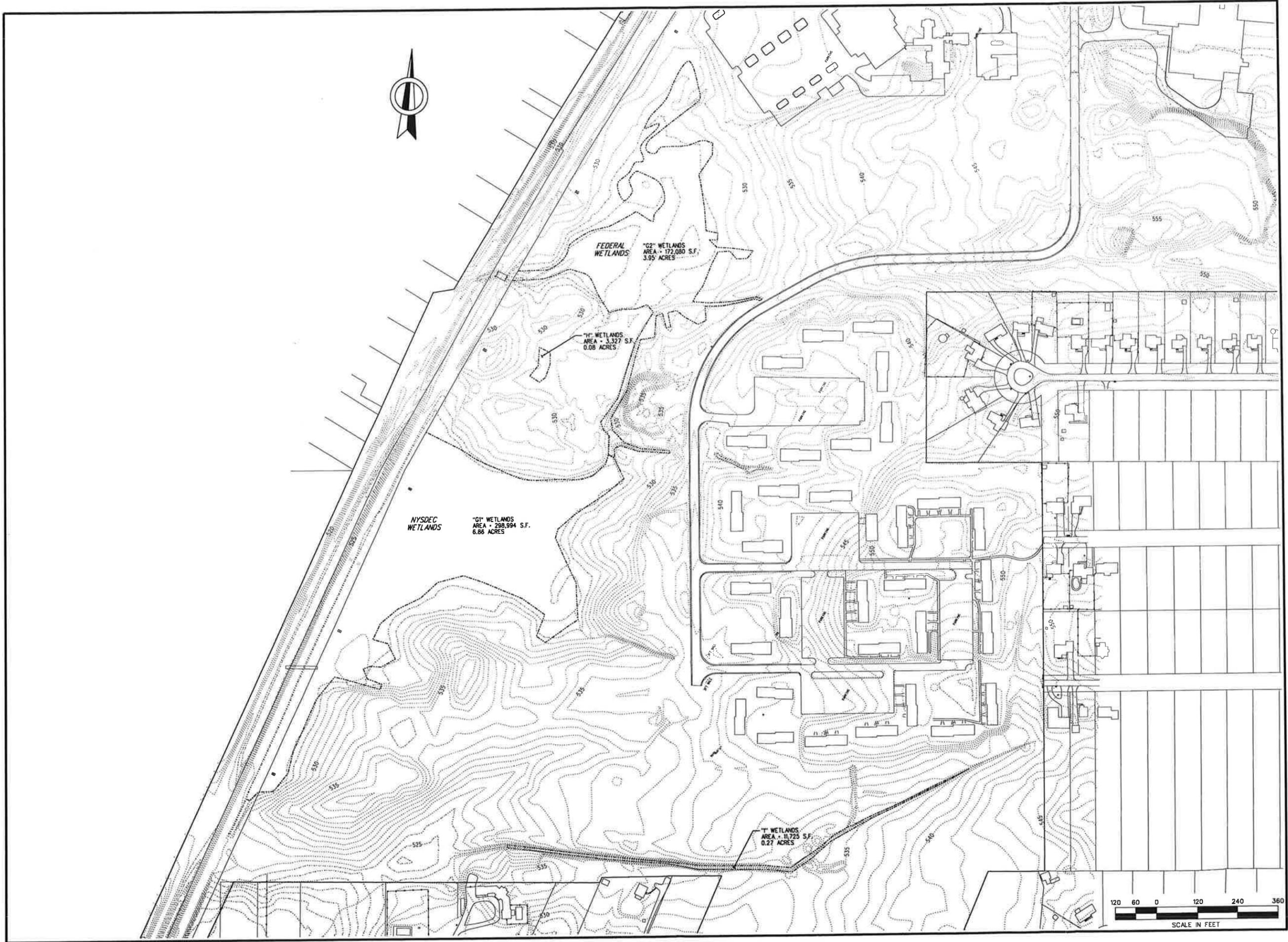
NO.	DATE	DESCRIPTION	REVISIONS
1			
2			

DATE

TYLINT INTERNATIONAL
 255 EAST AVENUE
 ROCHESTER, NY 14604
 (800) 512-2000

EXISTING WETLAND PLAN
 U OF R SOUTH CAMPUS
 EAST RIVER ROAD
 UNIVERSITY OF ROCHESTER
 271 EAST RIVER ROAD
 ROCHESTER, NY 14627

PROJECT NO. 43.5626.02	PROJ. MGR. DUK
DATE 10/31/13	DRW. BY NEB
SCALE 1"=60'	CHKD. BY DUK
DRAWING NO. W-1	
SHEET NO. 1 of 1	



UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF NEW YORK STATE EDUCATION LAW ARTICLE 145, SECTION 7209

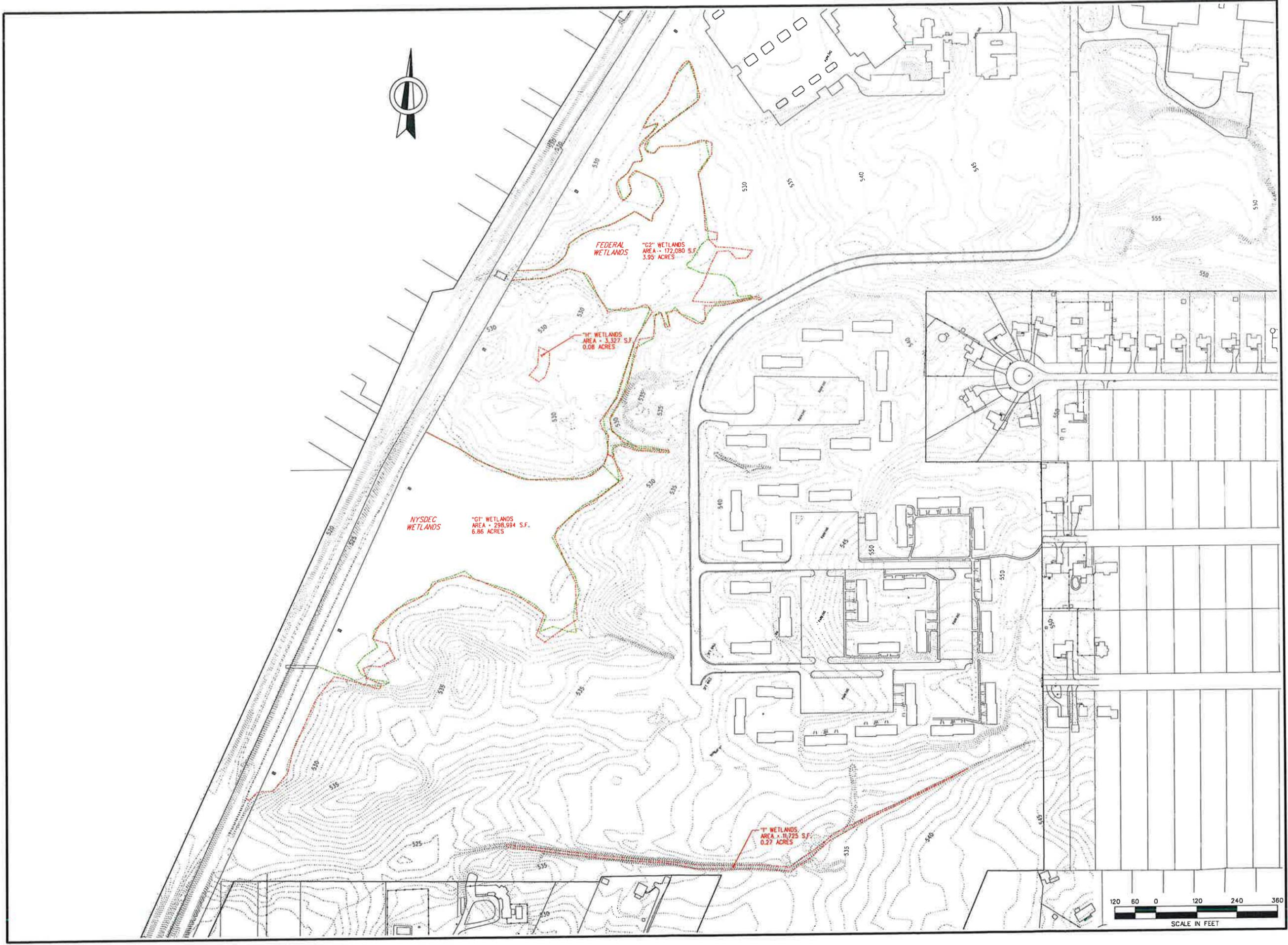
NO.	DATE	DESCRIPTION	REV/ISSUES
1			
2			
3			

DATE

TYLINT INTERNATIONAL
 285 EAST AVENUE
 ROCHESTER, NY 14604
 (385) 512-2000

DRAWING TITLE: **EXISTING WETLAND PLAN**
 PROJECT NAME: **U OF R SOUTH CAMPUS**
 EAST RIVER ROAD BRIGHTON, NEW YORK
 CLIENT: **UNIVERSITY OF ROCHESTER**
 271 EAST RIVER ROAD ROCHESTER, NY 14627

PROJECT NO:	PROJ.MGR:
43.5626.02	DJK
DATE:	DRWN.BY:
10/31/13	NEB
SCALE:	CHKD.BY:
1"=120'	DJK
DRAWING NO:	
W-2	
SHEET NO:	
1 of 1	



UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF NEW YORK STATE ELECTION LAW ARTICLE 10, SECTION 209B

NO.	DATE	DESCRIPTION	REVISIONS
1			
2			

DATE

TYLIN INTERNATIONAL
 255 EAST AVENUE
 ROCHESTER, NY 14604
 (585) 512-2000

DRAWING TITLE: **EXISTING WETLAND PLAN**
 PROJECT NAME: **U OF R SOUTH CAMPUS**
 EAST RIVER ROAD BRIGHTON, NEW YORK
 CLIENT: **UNIVERSITY OF ROCHESTER**
 271 EAST HIVER ROAD ROCHESTER, NY 14627

PROJECT NO:	43.5626.02	PROJECT MGR:	DJK
DATE:	10/31/13	DRW. BY:	NEB
SCALE:	1" = 120'	CHKD. BY:	DJK
DRAWING NO:	W-3		
SHEET NO:	1 of 1		

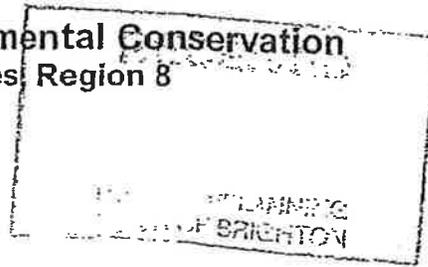
New York State Department of Environmental Conservation
Division of Fish, Wildlife and Marine Resources Region 8

Bureau of Habitat

6274 East Avon-Lima Road, Avon, New York 14414-9519

Phone: (585) 226-2466 • FAX: (585) 226-9789

Website: www.dec.state.ny.us



Denise M. Sheehan
Commissioner

January 17, 2006

Mr. Ramsey Boehner, Environmental Review Liaison Review Officer
Town of Brighton
2300 Elmwood Avenue
Rochester, NY 14618

**RE: University of Rochester - Proposed Institutional Planned Development (IPD) District
Town of Brighton Project # ER-20-04
Review of Wetland Delineation (Environmental Resources LLC, August 2005)**

Dear Mr. Boehner:

I have reviewed the wetland delineation report prepared for the University of Rochester by Environmental Resources and recently (1/6/06) visited the site with Environmental Resources staff (John Hauber). Our purpose was to confirm wetland boundaries and to determine which of the delineated wetland areas meet the criteria in New York Environmental Conservation Law (6 NYCRR Part 664) for inclusion on the Freshwater Wetland Map for Monroe County. Our evaluation was limited to wetlands G, J & K on University of Rochester property (refer to Fig. 5, "Wetland Location Map," in the delineation report) but did include additional contiguous wetlands on the adjacent Monroe County Park property to the west.

Results

The Department concurred with the boundaries of wetlands J, K & G as delineated on the U of R property but determined that wetlands in several areas extended beyond the property bounds:

Wetland G

At its northern end wetland G was found to extend beyond the delineated limits, in a northwesterly direction and off the U of R property, to a point within the electrical transmission ROW. The southern portion of the wetland was found to extend westward onto the Monroe County Genesee Valley Park. It is hydrologically connected via a culvert located near the southern edge of parcel 8.

Based on our assessment the southern portion of wetland G and the contiguous wetland off-property to the west comprise an approximately 17.8 acre wetland complex that meets the criteria for inclusion on the Freshwater Wetland Map (see attached aerial photo with approximate wetland boundary).

The northern portion of wetland G, although hydrologically connected with the southern portion by a southerly-flowing ditch, does not appear to meet the criteria for inclusion on the Map. The 2 wetland areas are greater than 50 meters (~165 feet) from each other and the ditch or unclassified intermittent stream is

an excavated feature flowing through uplands. The northern portion of wetland G is less than the 12.4 acres necessary to consider it as a separate Freshwater Wetland.

Wetlands J & K

These 2 wetlands are also less than 12.4 acres and are greater than 50 meters from other noncontiguous wetlands. They do not meet the criteria for inclusion on the Freshwater Wetland Map.

Wetlands A-F, H, L-P

We did not confirm the boundaries of these smaller disjunct wetlands as it was clear from the delineation report that they do not meet the requirements for inclusion on the Freshwater Wetland Map due to their small size and wide separation from other larger wetland areas.

Possible Additional Undelineated Wetland Areas

We observed a series of small vernal pool type wet areas within parcel 3 that had not been delineated. These areas appeared to be hydrologically connected via surface flows to the northern portion of wetland G. Environmental Resources concurred that these areas warrant further investigation to determine if they constitute additional jurisdictional wetlands for the US Army Corps of Engineers.

Summary

portion of the delineated wetlands (the southern half of wetland G) meet the criteria for inclusion on the Freshwater Wetland Map for Monroe County. It is the Department's intent to initiate a Freshwater Wetland Map amendment to add this wetland to the Map as BR-18. The approximate limits of BR-18 are shown on the attached GIS-based aerial photo and show the approximate wetlands limits both on and off the University of Rochester South Campus property. For planning and development purposes, regulated activities as defined in NYS Environmental Conservation Law proposed within either BR-18 or its 100-foot adjacent area will require an Art. 24 (Freshwater Wetland) permit from the Department.

All delineated wetlands as well as the undelineated potential wetland areas on parcel 3 may be jurisdictional for the US Army Corps of Engineers under Sec. 404(b) of the federal Water Pollution Control Act (Clean Water Act). The delineation report should be submitted to the Corps for a jurisdictional determination.

Thank you for the opportunity to review the wetland delineation report and comment on the Department's presumptive jurisdiction under ECL Article 24 (Freshwater Wetlands Act). Feel free to contact me if you have any questions or there is anything I can clarify.

Sincerely,

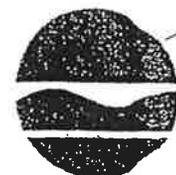


Scott Jones, Biologist I (Ecology)

encl

cc: Environmental Resources LLC
NYS DEC Div. Env. Permits (SEQRA file)
US Army Corps of Engineers Regulatory Branch (Buffalo)

New York State Department of Environmental Conservation
 Division of Fish, Wildlife and Marine Resources, Region 8
 Bureau of Wildlife
 6274 East Avon-Lima Road, Avon, New York 14414-9519
 Phone: (585) 226-2466 • FAX: (585) 226-3009
 Website: www.dec.state.ny.us



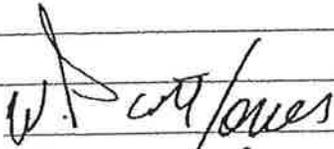
Denise M. Sheehan
 Commissioner

Freshwater Wetlands Determination

NAME Gene Pellett		WETLAND ID# BR-18 (new)	DATE INVESTIGATION CONDUCTED 1/6/06
ORGANIZATION Environmental Resources, LLC	WETLAND LOCATION TOWN: Brighton		COUNTY: Monroe
STREET ADDRESS 33 Kress Hill Dr.			
CITY - VILLAGE - TOWN Spencerport	STATE NY	ZIP CODE 14559	
RE: University of Rochester - South Campus Wetland Delineation Report (August 2005)			
<p>This letter is in response to your inquiry regarding the applicability of Article 24 (Freshwater Wetland Act) regulations to the parcel of land in question. An investigation was conducted and, based on this determination, the Department of Environmental Conservation finds that the statements checked below apply to the subject property:</p> <ul style="list-style-type: none"> * A regulated Freshwater Wetland is located on or within 100 feet of this property, and regulated activities in the wetland or within the 100-foot adjacent area are subject to permit requirements. * There is no currently-mapped regulated Freshwater Wetland on or within 100 feet of this property. No wetland permit is required at this time. <p>The project, as described, is within 100 feet of a regulated wetland, and a wetland permit will be required prior to the commencement of the proposed project.</p> <p>The property contains a regulated wetland and/or is within 100 feet of a wetland boundary, but the described project is located outside the regulated area and will not require a wetland permit.</p> <ul style="list-style-type: none"> X Please contact the U.S. Army Corps of Engineers (Buffalo office) at 716-879-4330 regarding any federally protected wetlands in the vicinity. X The boundary of the regulated wetland located on this property has been precisely delineated as follows: By Environmental Resources LLC (Aug. 2005 Wetland Delineation Report). Staff visited the site with John Hauber (Env. Res. LLC) and concurred with the boundaries as delineated. 			

****Note:** A portion of the delineated wetlands meet the criteria for inclusion on the Freshwater Wetland Map for Monroe County. It is the Department's intent to initiate a Freshwater Wetland Map amendment to add this wetland to the Map as BR-18. The approximate limits of BR-18 are shown on the attached GIS-based aerial photo and show the approximate wetlands limits both on and off the University of Rochester South Campus property. For planning and development purposes, regulated activities as defined in NYS Environmental Conservation Law proposed within either BR-18 or its 100-foot adjacent area will require an Art. 24 (Freshwater Wetland) permit from the Department.

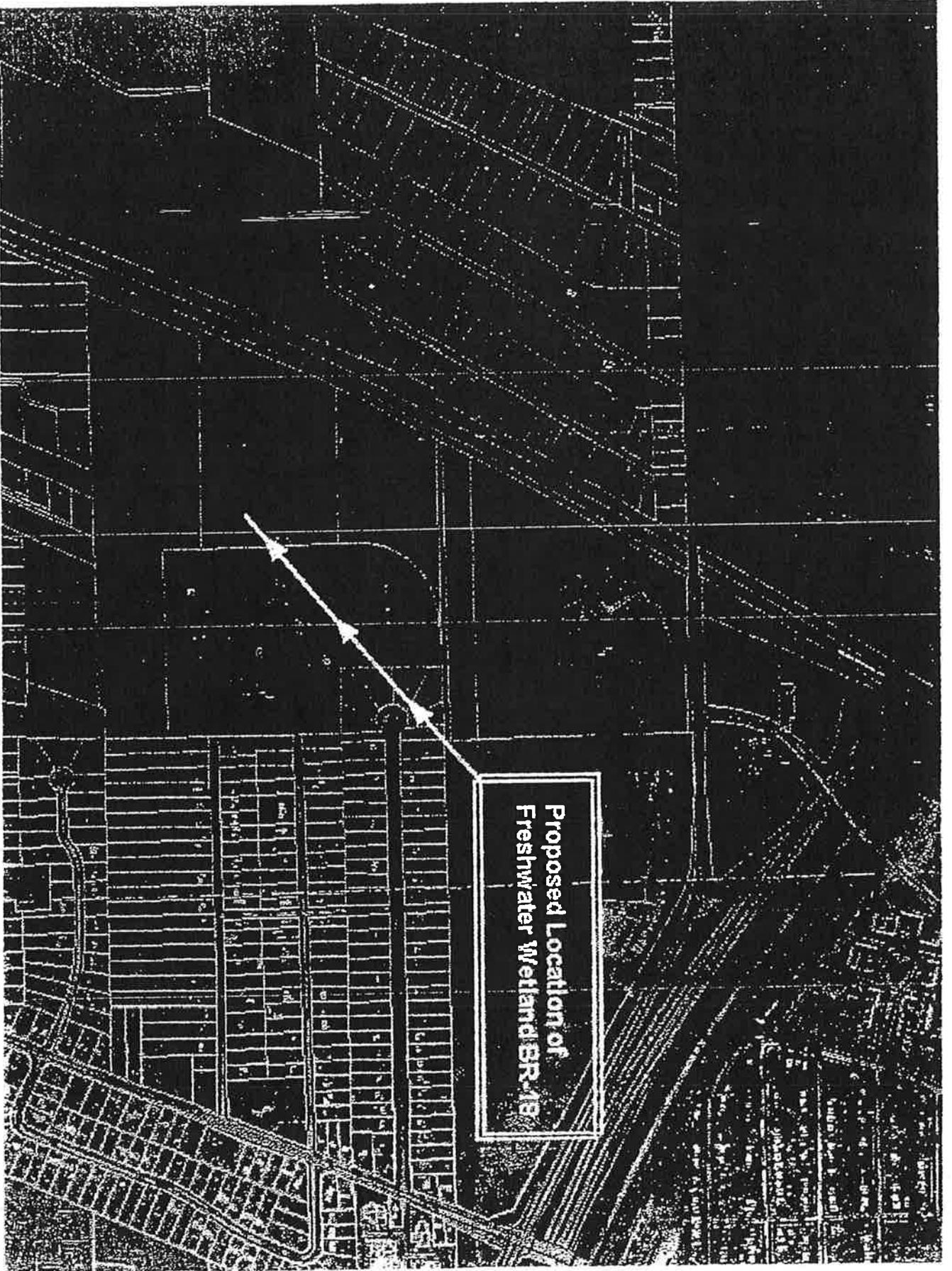
SIGNED:



Scott Jones

TITLE: Biologist I (Ecology)

Department wetland field delineations remain in effect for a period of three years, after which they are subject to revision at the Department's discretion, due to changing site conditions. Measurement of the 100-foot adjacent area is done *horizontally* upland from the wetland boundary, not along the ground surface. The identification of the adjacent area boundary, if done, is the responsibility of the landowner or project sponsor.



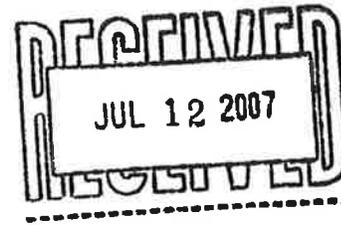
br-18 with 2002 thophoto.jpg



ENVIRONMENTAL RESOURCES, LLC
CONSULTING SERVICES

DJK

July 12, 2007



Mr. Joe Krawczyk
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207-3199

RE: Department of the Army Application/Processing No. 2003-686-4
230± Acre South Campus at the University of Rochester

Dear Joe:

In response to your request for additional information pursuant to our January 12, 2007 site visit/jurisdictional review of the above referenced project site, Environmental Resources, LLC (ERS) submits the enclosed wetland delineation map amendments on behalf of the University of Rochester. This information is submitted in support of a USACE formal jurisdictional wetland determination.

The attached map amendments address the following items that were requested to be "re-investigated, revised, or clarified" in your January 18, 2007 e-mail:

- The boundaries of Wetland K have been modified (expanded to the NE) with acreage revised.
- The boundary of Wetland J has been modified, and acreage revised, to include drainage continuing to a culvert off the shoulder of Kendrick Road.
- The culvert at Kendrick Road is shown with drainage described.
- The spillway at Wetlands L and M is illustrated.
- The spillway at Wetlands p and M is illustrated.
- The spillway from Wetland O to Wetland P/M is illustrated.
- The culvert at the NW corner of Wetland M is illustrated and drainage described.
- The drainage channel, which winds around the northern end of Wetland N is illustrated.
- Wetland G near the headwall has been re-investigated and additional wetland area added to the north.
- A 24" box culvert has been added off-site of Wetland G under the old railroad grade. Drainage is believed to flow east into and through Wetland G to the south, then back under the railroad grade into new NYSDEC Freshwater Wetland BR-18, then into Red Creek.
- A 6" culvert has been added beneath the unimproved road, and affiliated with Wetland A.
- Outflow drainage from wetland A has been illustrated as requested.
- The drainage swale extending from the northwest boundary of Wetland E towards Crittenden Road has been added along with the 24" culvert.

Mr. Joe Krawczyk
July 12, 2007
Page 2

In addition to the above drawing amendments, new acreages have been added to the modified wetlands, as well as linear footages of new drainage swales.

Please provide written confirmation of USACE jurisdictional wetlands, so that the University of Rochester can proceed with re-zoning initiatives with the Town of Brighton.

If you have any questions on the enclosed or require additional information, please feel free to contact me.

Sincerely,
Environmental Resources, LLC



Gene Pellett
Wetlands Ecologist/Member

Enclosures.

Cc: Dennis Kennelly, FRA Engineering, P.C.



DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207-3199

REPLY TO

October 15, 2007

Regulatory Branch

SUBJECT: Jurisdictional Determination, Department of Army Application No. 2003-00686,
New York State Department of Environmental Conservation No.

Mr. Paul Tankel
212 Fauver Stadium
Rochester, New York 14627

Dear Mr. Tankel:

This pertains to the University of Rochester's request for a jurisdictional determination for approximately 17.1-acres of wetlands located on the approximately 230-acre University of Rochester south campus. The subject parcel is located south of East River Road, in the City of Rochester, Monroe County, New York.

Section 404 of the Clean Water Act establishes Corps of Engineers jurisdiction over the discharge of dredged or fill material into waters of the United States, including wetlands, as defined in 33 CFR Part 328.3.

I am hereby verifying the Federal wetland boundaries as shown on the attached wetland delineation map (see enclosed sheets 2 through 8 of 8) dated July, 2007. This verification was confirmed on October 15, 2007 and will remain valid for a period of five (5) years from the date of this correspondence unless new information warrants revision of the delineation before the expiration. At the end of this period, a new wetland delineation will be required if a project has not been completed on this property and additional impacts are proposed for waters of the United States. Further, this delineation/determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular site identified in this request. This delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resource Conservation Service prior to starting work.

Based upon my review of the submitted delineation and on-site observations, I have determined that wetland areas A, C, E, G, J, K, L, M, N, O and P on the subject parcel are all part of a surface water tributary system to a navigable water of the United States (i.e., they drain into Red Creek which subsequently drains into the Erie Canal) as noted on the attached Jurisdictional Determination form. Therefore, the wetlands are regulated under Section 404 of the Clean Water

Regulatory Branch

SUBJECT: Jurisdictional Determination, Department of Army Application No. 2003-00686,
New York State Department of Environmental Conservation No.

Act. Department of the Army authorization is required if you propose a discharge of dredged or fill material in these areas.

In addition, I have determined that there is no clear surface water connection or ecological continuum between wetland area D on the parcel and a surface tributary system to a navigable water of the United States. Therefore, this water is considered an isolated, non-navigable, intrastate water and is not regulated under Section 404 of the Clean Water Act. Accordingly, you do not need Department of the Army authorization to commence work in this area.

I encourage you to contact the appropriate state and local governmental officials to ensure that the proposed work complies with their requirements.

Finally, this letter contains an approved jurisdictional determination for the subject parcel. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal the above determination, you must submit a completed RFA form within **60 days** of the date on this letter to the Great Lakes/Ohio River Division Office at the following address:

Mr. Mike Montone, Regulatory Review Officer
Great Lakes and Ohio River Division
CELRD-PDS-O
550 Main Street, Room 10032
Cincinnati, Ohio 45202-3222
Phone: 513-684-6212

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 C.F.R. part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **December 14, 2007**.

It is not necessary to submit an RFA to the Division office if you do not object to the determination in this letter.

A copy of this correspondence has been forwarded to Mr. Gene Pellett of Environmental Resources, LLC.

Regulatory Branch

SUBJECT: Jurisdictional Determination, Department of Army Application No. 2003-00686,
New York State Department of Environmental Conservation No.

Questions pertaining to this matter should be directed to me at (716) 879-4186, by writing to the following address: U.S. Army Corps of Engineers, 1776 Niagara Street, Buffalo, New York 14207, or by e-mail at: joseph.w.krawczyk@usace.army.mil

Sincerely,

SIGNED

Joseph Krawczyk
Biologist

Enclosures

Applicant: University of Rochester		File Number: 2003-00686	Date: October 15, 2007
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of permission)		B
	PERMIT DENIAL		C
X	APPROVED JURISDICTIONAL DETERMINATION		D
	PRELIMINARY JURISDICTIONAL DETERMINATION		E

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to re-evaluate the JD.

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

If you have questions regarding this decision and/or the appeal process you may contact:

Joseph Krawczyk
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207
(716) 879-4186
joseph.w.krawczyk@usace.army.mil

If you only have questions regarding the appeal process you may also contact:

Mr. Michael Montone
U.S. Army Corps of Engineers
Great Lakes and Ohio River Division
550 Main Street, Room 10032
Cincinnati, OH 45202-3222
(513) 684-6212; FAX(513) 684-2460
michael.g.montone@lrdor.usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day period of any site investigation, and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.

Date:

Telephone number:

INFORMATION SHEET

DETERMINATIONS OF NO JURISDICTION FOR ISOLATED, NON-NAVIGABLE, INTRA-STATE WATERS RESULTING FROM U.S. SUPREME COURT DECISION IN SOLID WASTE AGENCY OF NORTHERN COOK COUNTY V. U.S. ARMY CORPS OF ENGINEERS

DISTRICT OFFICE: Buffalo District

FILE NUMBER: 2003-00686

REGULATORY PROJECT MANAGER: Joseph W. Krawczyk **Date:** 10-15-2007

PROJECT REVIEW/DETERMINATION COMPLETED: **In the office (Y/N)** **Date:**

At the project site (Y/N) Y **Date:** 1-12-2007

PROJECT LOCATION INFORMATION:

State: New York

County: Monroe

Center coordinates of site by latitude & longitude coordinates: 43.1084°N, 77.6395°W (NAD83)

Approximate size of site/property (including uplands) in acres: 230

Name of waterway or watershed: Red Creek and Erie Canal

Type of Aquatic Resource ¹ :	0-1 ac	1-3 ac	3-5 ac	5-10 ac	10-25 ac	25-50 ac	> 50 ac	Linear Feet	Unknown
Lake									
River									
Stream									
Mudflat									
Sandflat									
Wetlands	X								
Slough									
Prairie Pothole									
Wet Meadow									
Playa Lake									
Vernal Pool									
Natural Pond									
Other Water (identify type)									

¹Check appropriate boxes that best describe type of isolated, non-navigable, intra-state water present and best estimate for size of non-jurisdictional aquatic resource area.

Migratory Bird Rule Factors ¹	If Known		If Unknown Use Best Professional Judgment		
	Yes	No	Predicted to Occur	Not Expected to Occur	Not Able to Make Determination
Is or would be used as habitat for birds protected by Migratory Bird Treaties?			X		
Is or would be used as habitat by other migratory birds at cross state lines?			X		
Is or would be used as habitat for endangered species?				X	
Is used to irrigate crops sold in interstate commerce?		X			

¹Check appropriate boxes that best describe potential for applicability of the Migratory Bird Rule to apply to onsite, non-jurisdictional, isolated, non-navigable, intra-state aquatic resource area.

ADDITIONAL INFORMATION SUPPORTING NJD (e.g., paragraph 1 site conditions; paragraphs 2-3 rationale used to determine NJD, including information reviewed to assess potential navigation or interstate commerce connections; and paragraph 4 site information on waters of the U.S. occurring onsite):

17.09-acres of wetlands were located on the 230-acre subject parcel, of which 0.16-acre was determined to be isolated.

Wetlands A, C, E, G, J, K, L, M, N, O and P all possessed surface water hydrological connections to Red Creek. Red Creek was located off-site and west of the subject parcel. Red Creek flowed north and drained directly into the Erie Canal. The Erie Canal is itself a navigable, Section 10 waterbody.

In all, approximately 1,320 linear feet of drainage channels were located on the subject parcel, which provided a surface water, hydrological connections of the jurisdictional wetland areas to a water of the United States. Additional surface water drainages not tallied above connected Wetland areas C and G to Red Creek. These drainages were not tallied in the 1,320 linear foot figure because these drainages were located off-site (to the east in the case of C and to the west in the case of G).

Wetland area D was the only wetland that was determined to be depressional and isolated, with no surface water hydrological connection to a water of the United States.

JURISDICTIONAL DETERMINATION
U.S. Army Corps of Engineers

Revised 8/13/04

DISTRICT OFFICE: Buffalo
FILE NUMBER: 2003-00686

PROJECT LOCATION INFORMATION:

State: New York
County: Monroe
Center coordinates of site (latitude/longitude): 43.1084°N, 77.6395°W (NAD83)
Approximate size of area (parcel) reviewed, including uplands: 230 acres.
Name of nearest waterway: Red Creek and Erie Canal
Name of watershed: Erie Canal

JURISDICTIONAL DETERMINATION

Completed: Desktop determination Date:
Site visit(s) Date(s): January 12, 2007

Jurisdictional Determination (JD):

- Preliminary JD - Based on available information, there appear to be (or) there appear to be no "waters of the United States" and/or "navigable waters of the United States" on the project site. A preliminary JD is not appealable (Reference 33 CFR part 331).
- Approved JD - An approved JD is an appealable action (Reference 33 CFR part 331).
Check all that apply:
- There are "navigable waters of the United States" (as defined by 33 CFR part 329 and associated guidance) within the reviewed area. Approximate size of jurisdictional area:
- There are "waters of the United States" (as defined by 33 CFR part 328 and associated guidance) within the reviewed area. Approximate size of jurisdictional area: 16.93-acres of wetland.
- There are "isolated, non-navigable, intra-state waters or wetlands" within the reviewed area.
 Decision supported by SWANCC/Migratory Bird Rule Information Sheet for Determination of No Jurisdiction.

BASIS OF JURISDICTIONAL DETERMINATION:

- A. Waters defined under 33 CFR part 329 as "navigable waters of the United States":
- The presence of waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
- B. Waters defined under 33 CFR part 328.3(a) as "waters of the United States":
- (1) The presence of waters, which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
- (2) The presence of interstate waters including interstate wetlands¹.
- (3) The presence of other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate commerce including any such waters (check all that apply):
- (i) which are or could be used by interstate or foreign travelers for recreational or other purposes.
- (ii) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- (iii) which are or could be used for industrial purposes by industries in interstate commerce.
- (4) Impoundments of waters otherwise defined as waters of the US.
- (5) The presence of a tributary to a water identified in (1) - (4) above.
- (6) The presence of territorial seas.
- (7) The presence of wetlands adjacent² to other waters of the US, except for those wetlands adjacent to other wetlands.

Rationale for the Basis of Jurisdictional Determination (applies to any boxes checked above). *If the jurisdictional water or wetland is not itself a navigable water of the United States, describe connection(s) to the downstream navigable waters. If B(1) or B(3) is used as the Basis of Jurisdiction, document navigability and/or interstate commerce connection (i.e., discuss site conditions, including why the waterbody is navigable and/or how the destruction of the waterbody could affect interstate or foreign commerce). If B(2, 4, 5 or 6) is used as the Basis of Jurisdiction, document the rationale used to make the determination. If B(7) is used as the Basis of Jurisdiction, document the rationale used to make adjacency determination:*

17.09-acres of wetlands were located on the 230-acre subject parcel, of which 0.16-acre was determined to be isolated.

Wetlands A, C, E, G, J, K, L, M, N, O and P all possessed surface water hydrological connections to Red Creek, located off-site and west of the subject parcel. Red Creek flowed north and drained directly into the Erie Canal. The Erie Canal is itself a navigable, Section 10 waterbody.

Wetland area A flowed into an unnamed drainage channel. This unnamed drainage channel flowed west and then north, where it drained into a storm sewer located on the north side of Crittenden Road. The storm sewer then drained directly west into Red Creek.

Wetland area C flowed into an unnamed, intermittent tributary located off-site and to the east. This tributary then flowed southwest and drained directly into Red Creek.

Wetland area E flowed into an unnamed drainage and into the storm sewer located north of Crittenden Road (i.e., the same storm sewer noted for Wetland A above).

Wetland area G flowed into an unnamed tributary (located west and off-site) of Red Creek.

Wetland area J, drained into a 24" culvert pipe which then connected directly with Red Creek. Wetland area K was located directly adjacent (within 100 feet) to and drained into the same culvert pipe as Wetland J drained. Wetlands L, N, O, and P all drained through drainage channels of various lengths, into Wetland area M. Wetland area M then drained into a 36" culvert at its northern end, which flowed directly to Red Creek.

Wetland area D was the only wetland that was determined to be depressional, with no surface water hydrological connection to a water of the United States, and therefore isolated.

In all, there was approximately 1,320 linear feet of drainage channels located on the subject parcel, which provided surface water, hydrological connections to waters of the United States.

Lateral Extent of Jurisdiction: (Reference: 33 CFR parts 328 and 329)

- | | |
|--|--|
| <input type="checkbox"/> Ordinary High Water Mark indicated by: | <input type="checkbox"/> High Tide Line indicated by: |
| <input type="checkbox"/> clear, natural line impressed on the bank | <input type="checkbox"/> oil or scum line along shore objects |
| <input type="checkbox"/> the presence of litter and debris | <input type="checkbox"/> fine shell or debris deposits (foreshore) |
| <input type="checkbox"/> changes in the character of soil | <input type="checkbox"/> physical markings/characteristics |
| <input type="checkbox"/> destruction of terrestrial vegetation | <input type="checkbox"/> tidal gages |
| <input type="checkbox"/> shelving | <input type="checkbox"/> other: |
| <input type="checkbox"/> other: | |

- Mean High Water Mark indicated by:
 survey to available datum; physical markings; vegetation lines/changes in vegetation types.

- Wetland boundaries, as shown on the attached wetland delineation map and/or in a delineation report prepared by: Environmental Resources, LLC

Basis For Not Asserting Jurisdiction:

- The reviewed area consists entirely of uplands.
- Unable to confirm the presence of waters in 33 CFR part 328(a)(1, 2, or 4-7).
- Headquarters declined to approve jurisdiction on the basis of 33 CFR part 328.3(a)(3).
- The Corps has made a case-specific determination that the following waters present on the site are not Waters of the United States:
- Waste treatment systems, including treatment ponds or lagoons, pursuant to 33 CFR part 328.3.
 - Artificially irrigated areas, which would revert to upland if the irrigation ceased.
 - Artificial lakes and ponds created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing.
 - Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons.
 - Water-filled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States found at 33 CFR 328.3(a).
 - Isolated, intrastate wetland (Wetland D) with no nexus to interstate commerce.
 - Prior converted cropland, as determined by the Natural Resources Conservation Service. Explain rationale:
 - Non-tidal drainage or irrigation ditches excavated on dry land. Explain rationale:
 - Other (explain):

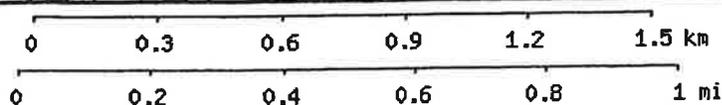
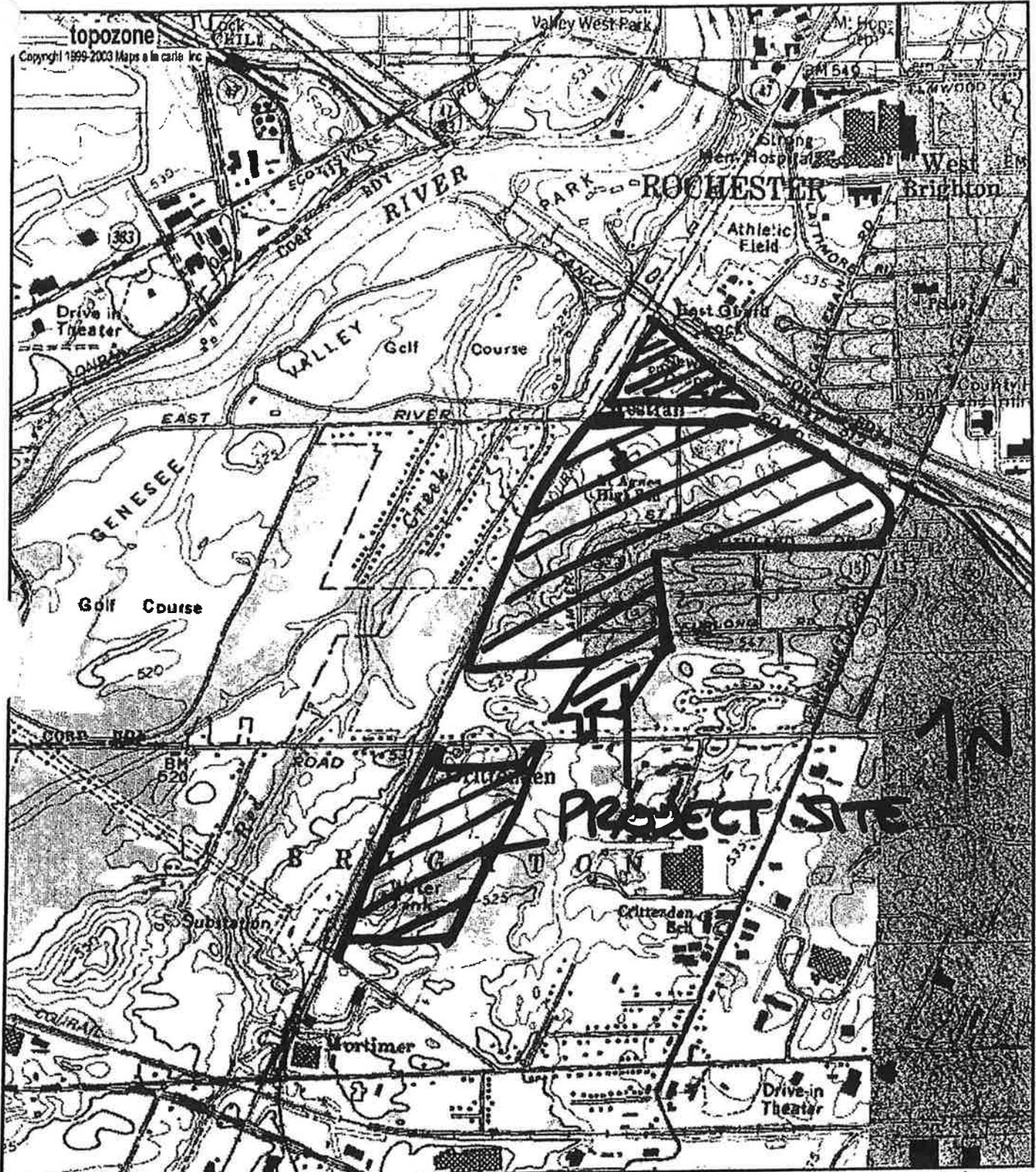
DATA REVIEWED FOR JURISDICTIONAL DETERMINATION (mark all that apply):

- Maps, plans, plots or plat submitted by or on behalf of the applicant.
- Data sheets prepared/submitted by or on behalf of the applicant.
- This office concurs with the delineation report, dated July 2007, prepared by (company): Environmental Resources, LLC.
- This office does not concur with the delineation report, dated _____, prepared by (company):

- U.S. Geological Survey Hydrologic Atlas:
- U.S. Geological Survey 7.5 Minute Topographic maps: West Henrietta
- U.S. Geological Survey 7.5 Minute Historic quadrangles:
- U.S. Geological Survey 15 Minute Historic quadrangles:
- USDA Natural Resources Conservation Service Soil Survey:
- National wetlands inventory maps:
- State/Local wetland inventory maps:
- FEMA/FIRM maps (Map Name & Date):
- 100-year Floodplain Elevation is: (NGVD)
- Aerial Photographs (Name & Date):
- Other photographs (Date):
- Advanced Identification Wetland maps:
- Site visit/determination conducted on: January 12, 2007
- Applicable/supporting case law:
- Other information (please specify):

¹Wetlands are identified and delineated using the methods and criteria established in the Corps Wetland Delineation Manual (87 Manual) (i.e., occurrence of hydrophytic vegetation, hydric soils and wetland hydrology).

²The term "adjacent" means bordering, contiguous, or neighboring. Wetlands separated from other waters of the U.S. by man-made dikes or barriers, natural river berms, beach dunes, and the like are also adjacent.



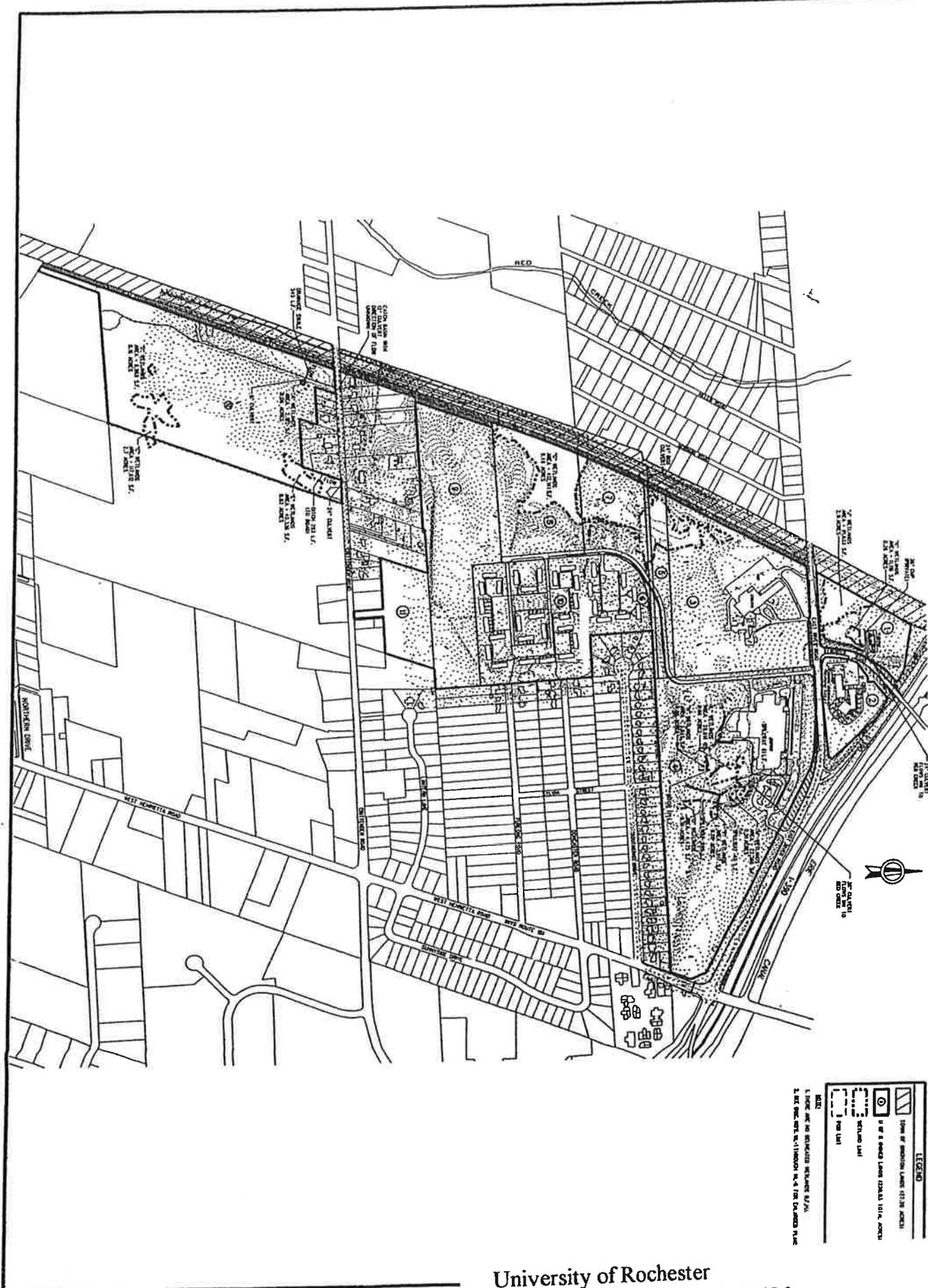
43.1084°N, 77.6395°W (NAD83/WGS84)

USGS West Henrietta (NY)

Projection is UTM Zone 18 N

University of Rochester
 D/A Processing No. 2003-00686
 Monroe County, New York





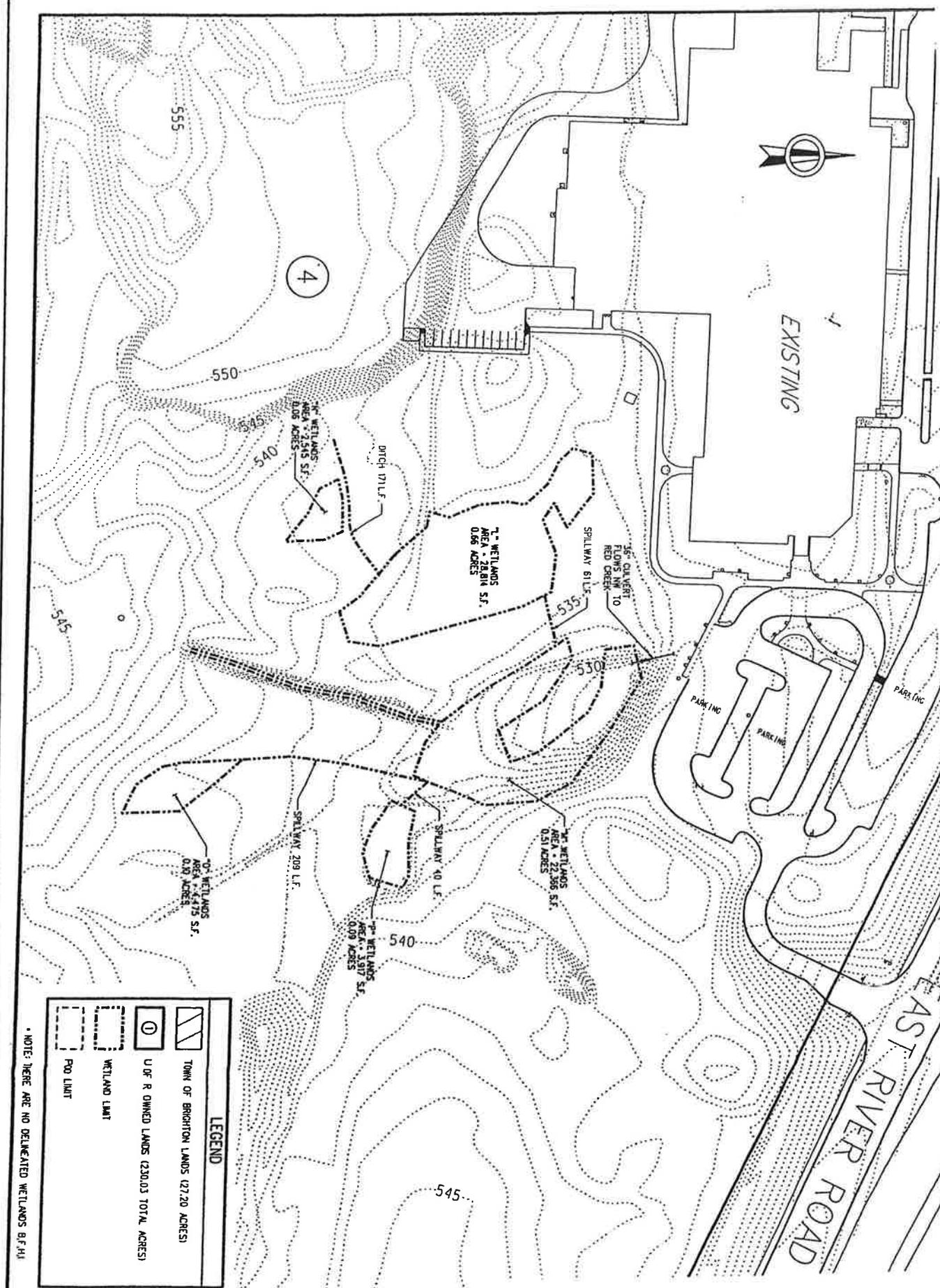
PROJECT NO. 01-2391
 DATE: JULY 20
 SCALE: AS SHOWN
 DRAWN BY: M
 CHECKED BY: M

FIGURE 5 - WETLAND LOCATION MAP
 PROJECT NAME:

University of Rochester
 D/A Processing No. 2003-00686
 Monroe County, New York
 West Henrietta

LEGEND

- WETLAND TYPE 1
- WETLAND TYPE 2
- WETLAND TYPE 3
- WETLAND TYPE 4
- WETLAND TYPE 5
- WETLAND TYPE 6
- WETLAND TYPE 7
- WETLAND TYPE 8
- WETLAND TYPE 9
- WETLAND TYPE 10
- WETLAND TYPE 11
- WETLAND TYPE 12
- WETLAND TYPE 13
- WETLAND TYPE 14
- WETLAND TYPE 15
- WETLAND TYPE 16
- WETLAND TYPE 17
- WETLAND TYPE 18
- WETLAND TYPE 19
- WETLAND TYPE 20



LEGEND

-  TOWN OF BRIGHTON LANDS (27.20 ACRES)
-  U OF R OWNED LANDS (230.03 TOTAL ACRES)
-  WETLAND LIMIT
-  POB LIMIT

• NOTE: THERE ARE NO DELINEATED WETLANDS B.F.H.I

PROJECT NO.	01-2388
DATE	JULY 2007
SCALE	1"=100'
DRAWN BY	WIL
CHECKED BY	2

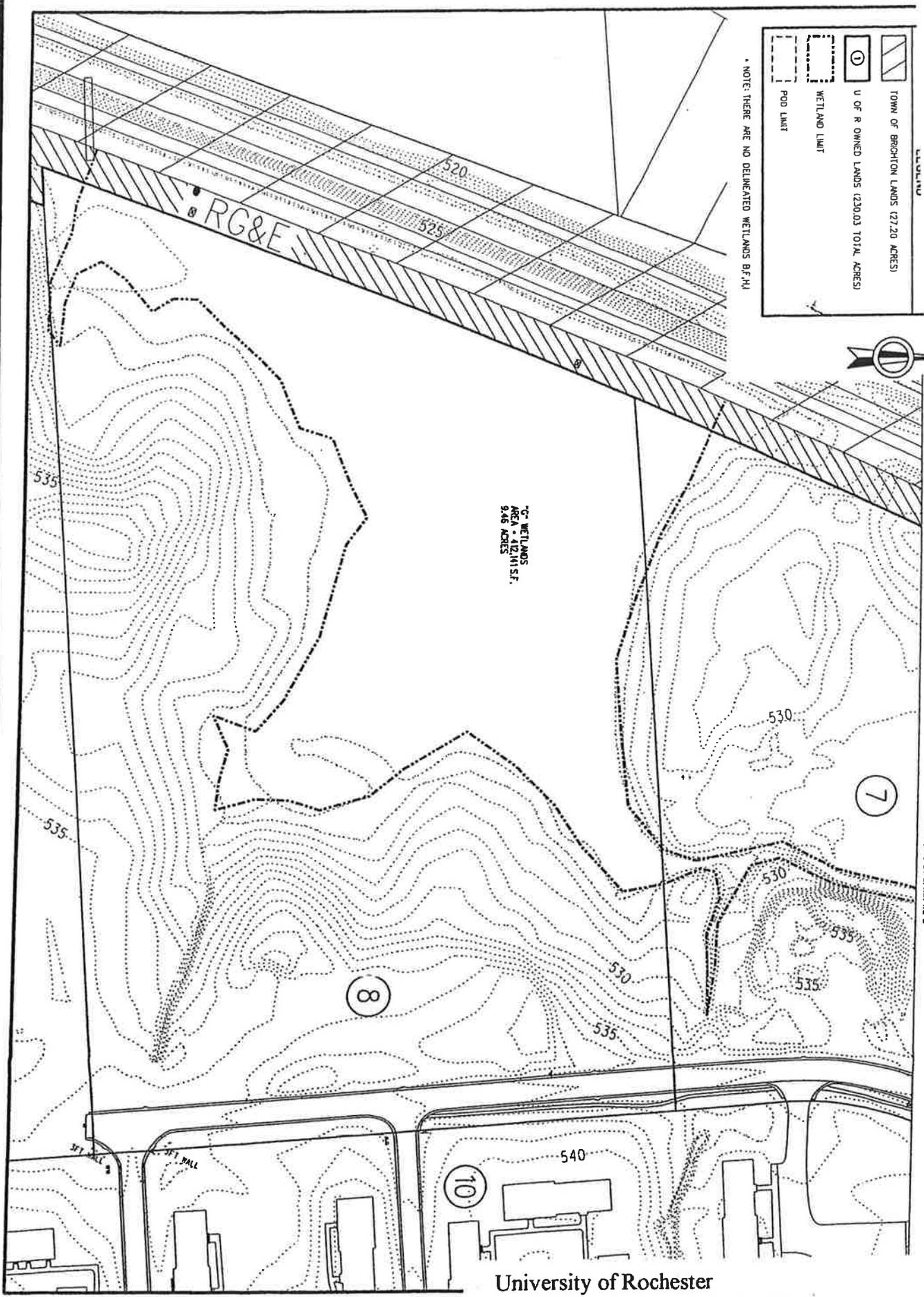
FIGURE 5 - WETLAND LOCATION MAP (WETLAND LOCATIONS L, M, N, D, & P)

PROJECT NAME: **IPD REZONING**
TOWN OF BRIGHTON COUNTY OF MONROE



University of Rochester
D/A Processing No. 2003-00686
Monroe County, New York
Quad: West Henrietta





TOWN OF BRIGHTON LANDS (27.20 ACRES)
 U OF R OWNED LANDS (230.03 TOTAL ACRES)
 WETLAND LIMIT
 POD LIMIT

* NOTE: THERE ARE NO DELINEATED WETLANDS B.F.H.I

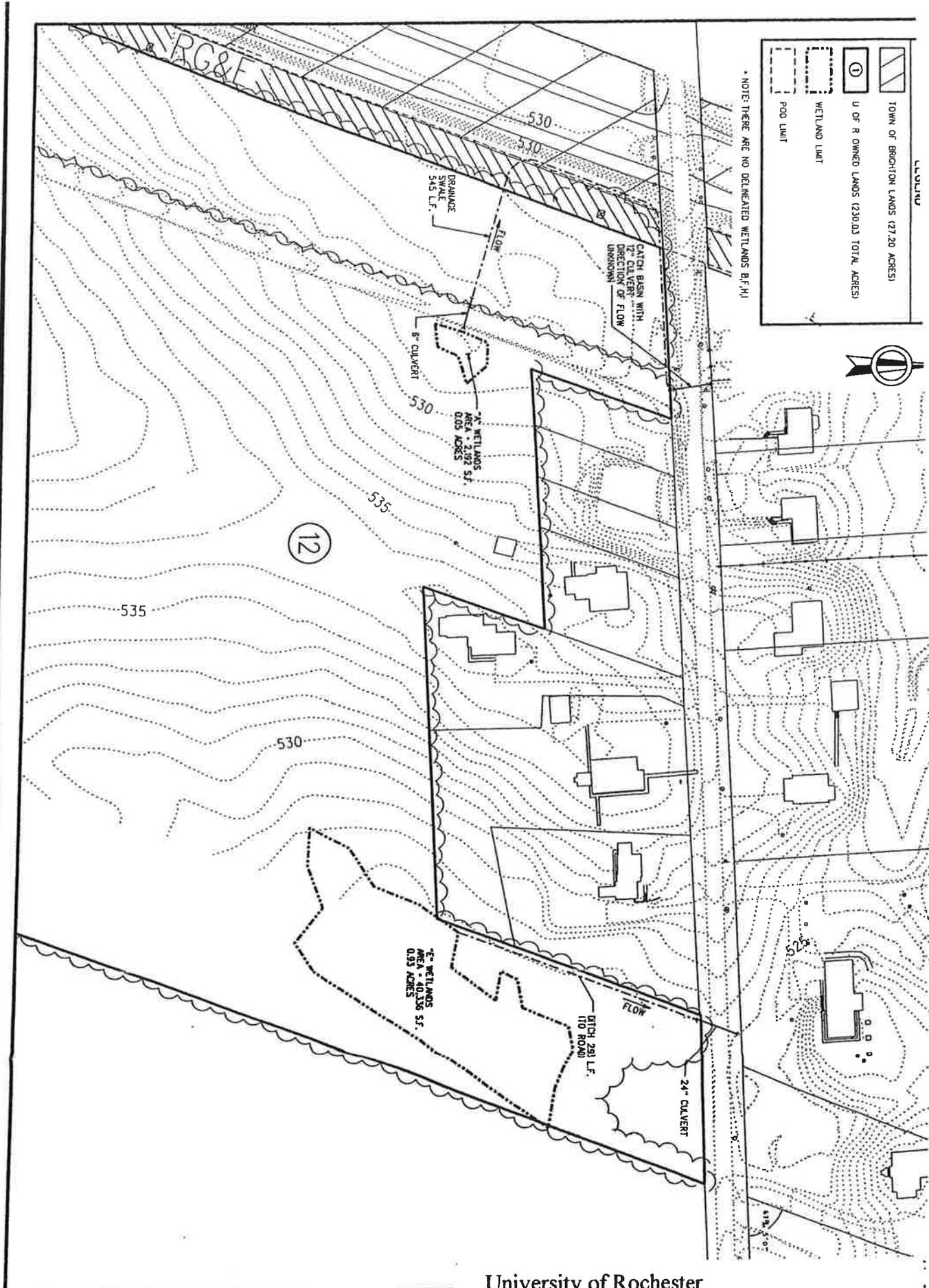
G WETLANDS
 AREA - 412,111 SF.
 9.46 ACRES

University of Rochester
 D/A Processing No. 2003-00686
 Monroe County, New York
 Quad: West Henrietta

PROJECT NO. 01-2398
 DATE: JULY 2007
 SCALE: 1"=100'
 DRAWN BY: WIL
 CHECKED BY: WIL

FIGURE 5 - WETLAND LOCATION MAP
 (WETLAND LOCATIONS G)
 IPD REZONING
 TOWN OF BRIGHTON COUNTY OF MONROE

MATCH LINE DWG. NO. WL-3



TOWN OF BRIGHTON LANDS (27.20 ACRES)

 U OF R OWNED LANDS (230.03 TOTAL ACRES)

 WETLAND LIMIT

 POB LIMIT

* NOTE: THERE ARE NO DELINEATED WETLANDS D.F.H.I.



PROJECT TITLE: **FIGURE 5 - WETLAND LOCATION MAP (WETLAND LOCATIONS A & E)**

 PROJECT NAME: **IPD REZONING**

PROJECT NO.: 01-2398

 DATE: JULY 2003

 SCALE: 1" = 100'

 DRAWING NO.: WI

 SHEET NO.: 5

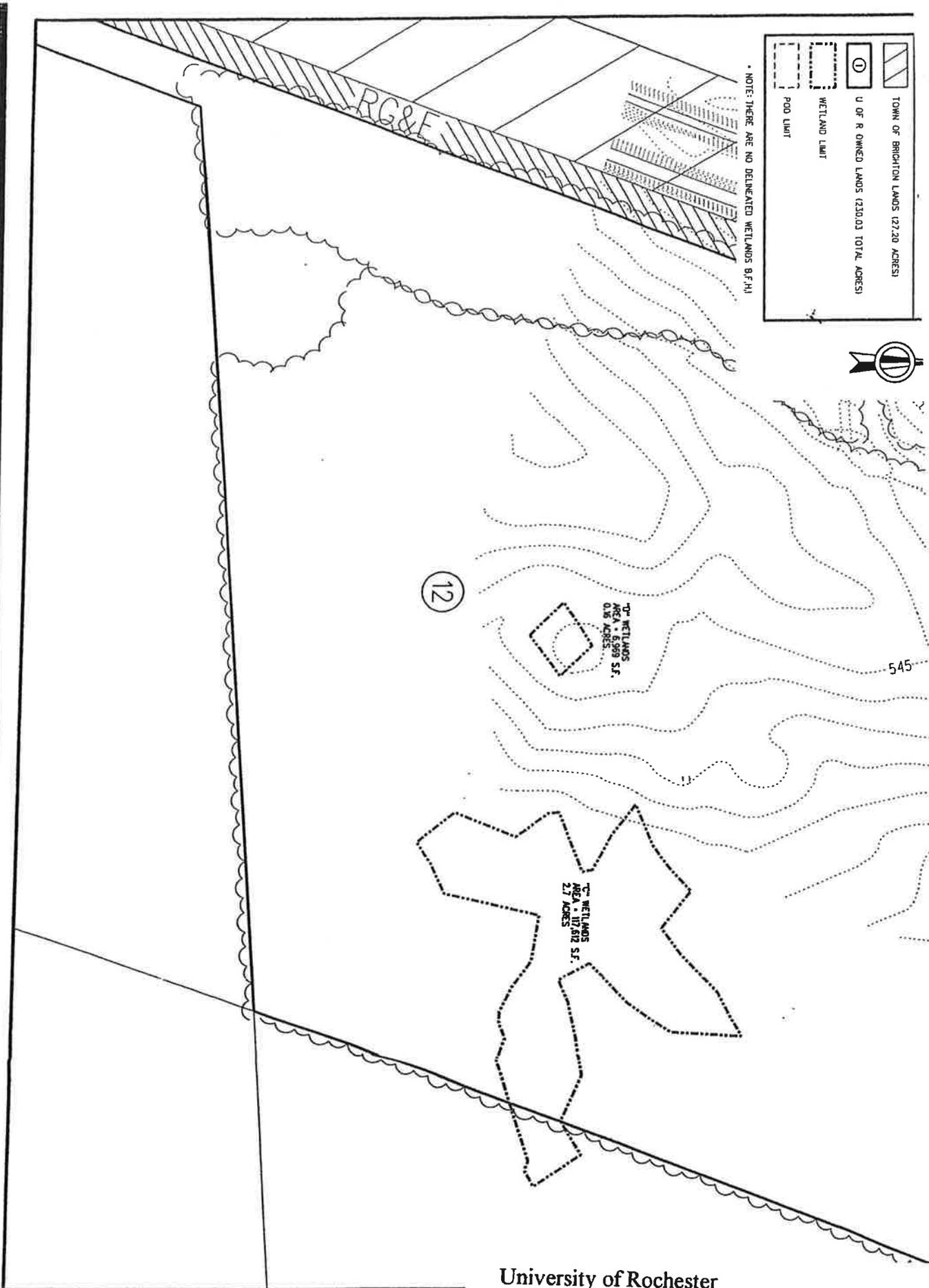
University of Rochester

 D/A Processing No. 2003-00686

 Monroe County, New York

 One West Henrietta





 TOWN OF BRIGHTON LANDS (27.20 ACRES)
 U OF R OWNED LANDS (230.03 TOTAL ACRES)
 WETLAND LIMIT
 POB LIMIT

• NOTE: THERE ARE NO DELINEATED WETLANDS 8(F,H)



545

12

WETLANDS
AREA - 8,999 S.F.
0.8 ACRES

WETLANDS
AREA - 10,612 S.F.
2.7 ACRES

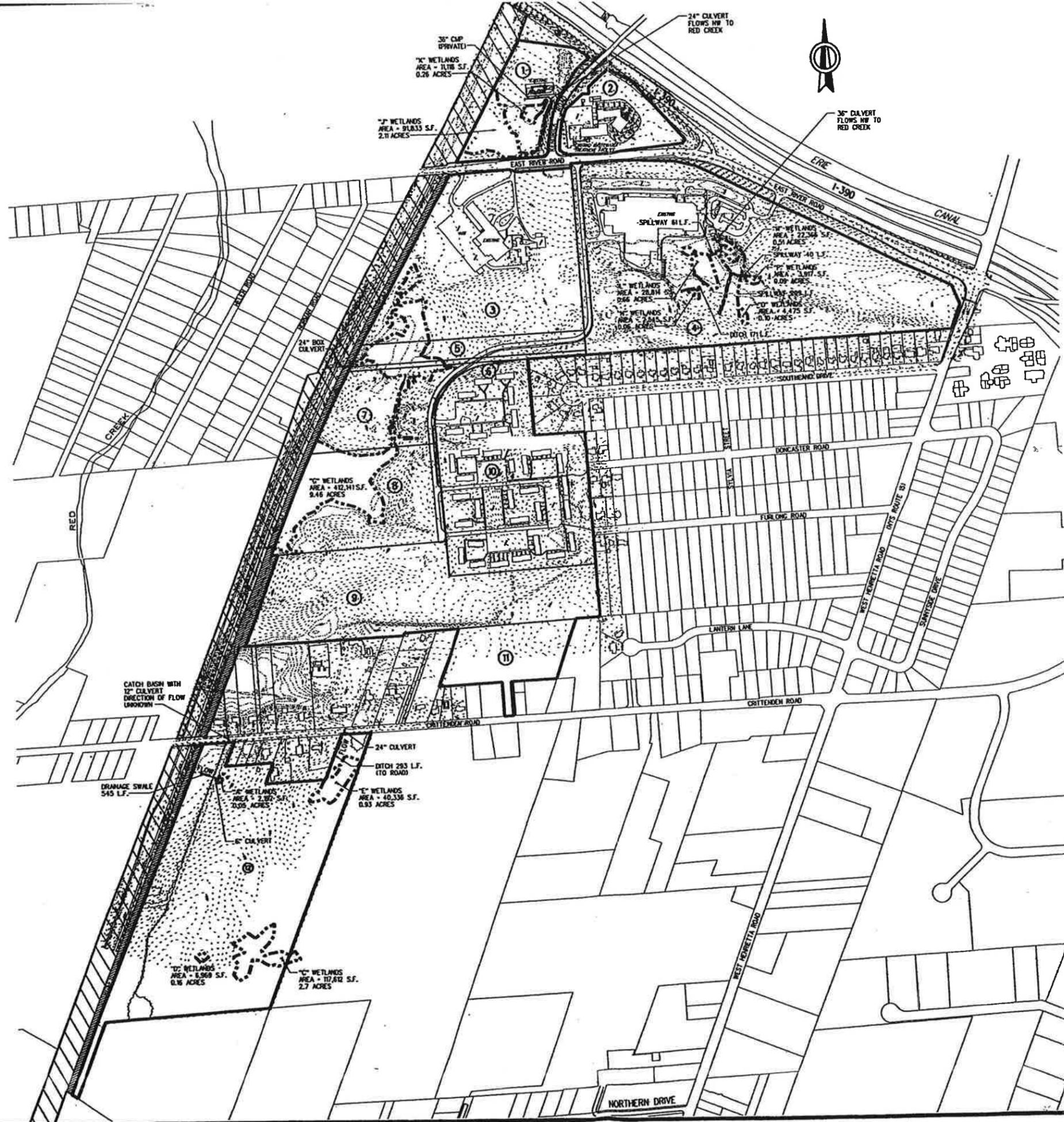
PROJECT NO.	01-2388
DATE	MAY 2007
SCALE	1"=100'
DRAWN BY	WL
CHECKED BY	6

FIGURE 5 - WETLAND LOCATION MAP
 (WETLAND LOCATIONS C & D)
 IPD REZONING
 TOWN OF BRIGHTON COUNTY OF MONROE



University of Rochester
 D/A Processing No. 2003-00686
 Monroe County, New York
 Quad: West Henrietta





LEGEND

- TOWN OF BRIGHTON LANDS (27.20 ACRES)
- U OF R DIVIDED LANDS (230.03 TOTAL ACRES)
- WETLAND LIMIT
- POD LIMIT

NOTE:
 1. THERE ARE NO DELINEATED WETLANDS BY JULI
 2. SEE DRG. NOS. WL-1 THROUGH WL-6 FOR ENLARGED PLANS.

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF NEW YORK STATE EDUCATION LAW ARTICLE 148, SECTION 7009

NO.	DATE	DESCRIPTION	REVISIONS
3			
2			
1			

DATE

830 SUMMIT POINT DRIVE
 ROCHESTER, NY 14487
 585/339-0280

TIA
 ENGINEERING

DRAWING TITLE:
 FIGURE 5 - WETLAND LOCATION MAP

PROJECT NAME:
 IPD REZONING
 TOWN OF BRIGHTON
 COUNTY OF MONROE

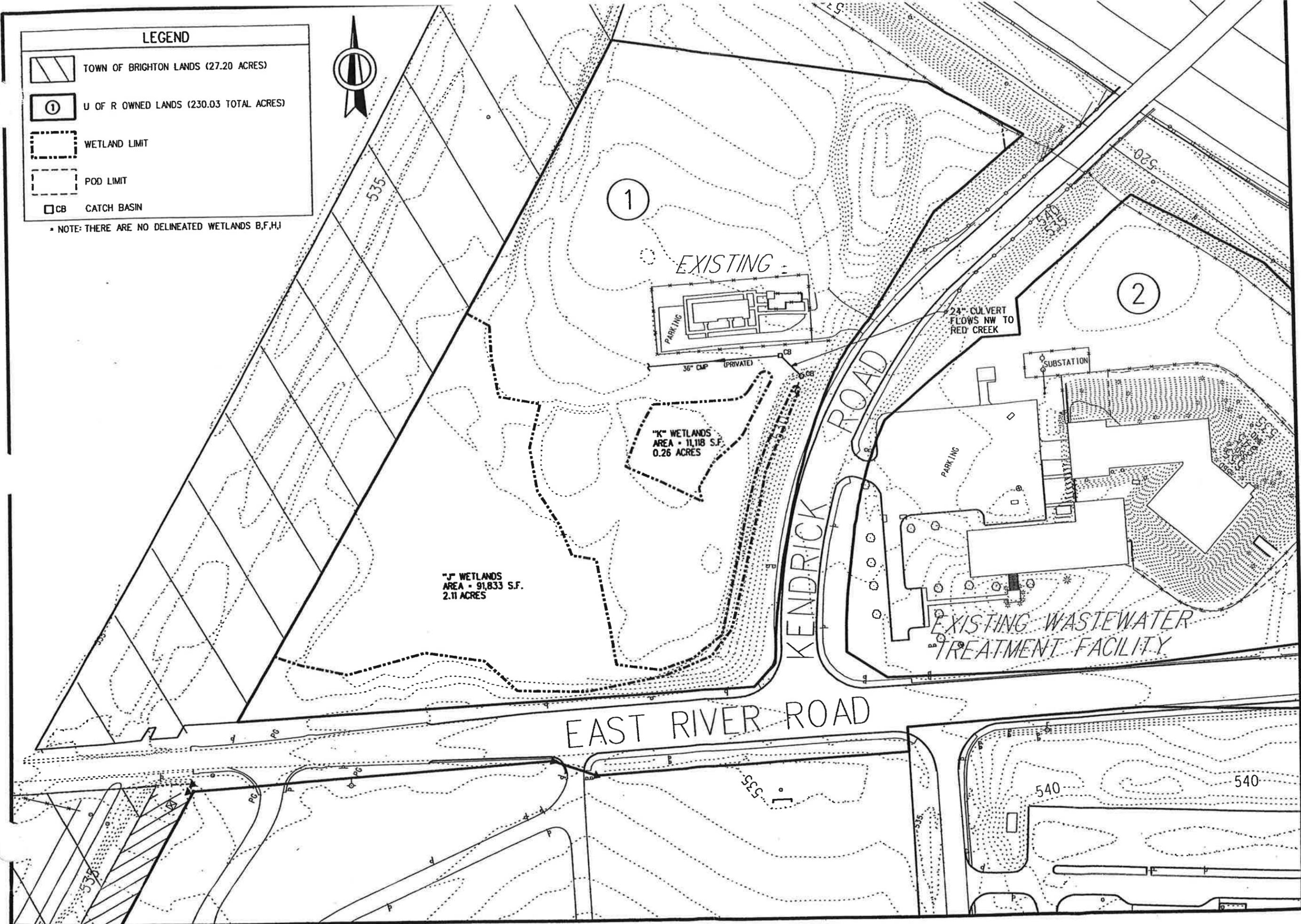
CLIENT:
 UNIVERSITY OF ROCHESTER

PROJECT NO.: 01-2398	PROJ. LEAD: DJA
DATE: JULY 2007	DRAWN BY: NEB
SCALE: NO SCALE	CHECKED BY: DJA
DRAWING NO.: WL-1A	
SHEET NO.: 1 of 1	

LEGEND

-  TOWN OF BRIGHTON LANDS (27.20 ACRES)
-  U OF R OWNED LANDS (230.03 TOTAL ACRES)
-  WETLAND LIMIT
-  POD LIMIT
-  CATCH BASIN

• NOTE: THERE ARE NO DELINEATED WETLANDS B,F,H,I



UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF NEW YORK STATE EDUCATION LAW ARTICLE 148, SECTION 1-205	
NO.	DATE
1	
2	
3	

DATE _____

530 SUMMIT POINT DRIVE
 NEWBURGH, NY 14487
 914-351-6280



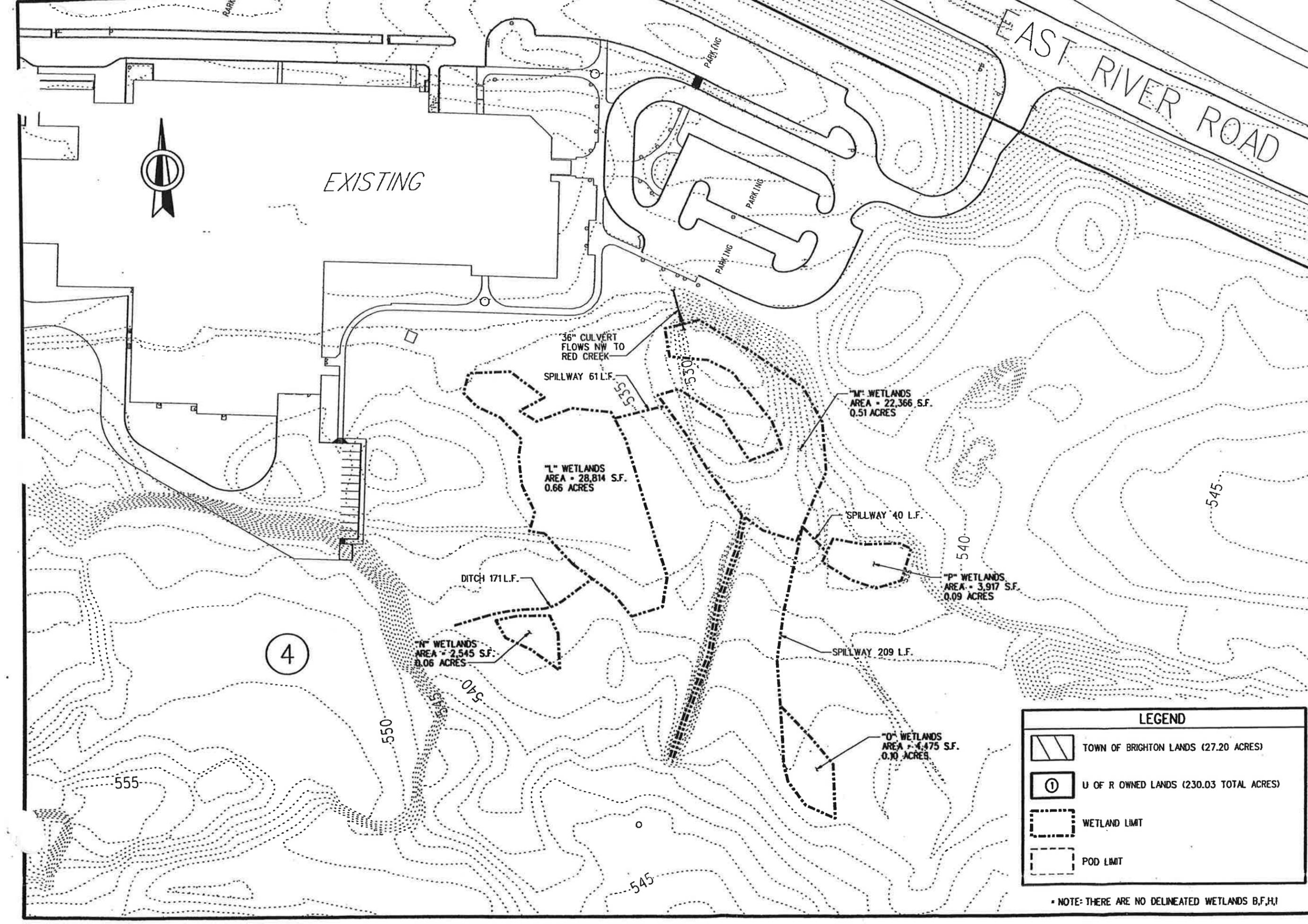
FRA
ENGINEERING

FIGURE 5 - WETLAND LOCATION MAP (WETLAND LOCATIONS J & K)

PROJECT NAME: IPD REZONING
 TOWN OF BRIGHTON
 COUNTY OF MONROE

CLIENT: UNIVERSITY OF ROCHESTER

PROJECT NO:	01-2398	DRAWN BY:	DJA
DATE:	JULY 2007	CHECKED BY:	NEB
SCALE:	1"=100'	DATE:	DJA
DRAWING NO:	WL-1		
SHEET NO.	1 of 6		



LEGEND	
	TOWN OF BRIGHTON LANDS (27.20 ACRES)
	U OF R OWNED LANDS (230.03 TOTAL ACRES)
	WETLAND LIMIT
	POD LIMIT

* NOTE: THERE ARE NO DELINEATED WETLANDS B,F,H,I

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF NEW YORK STATE EDUCATION LAW ARTICLE 145, SECTION 7809			
NO.	DATE	DESCRIPTION	REVISIONS
1			
2			
3			

DATE

530 SUMMIT POINT DRIVE
HENRIETTA, NY 14457
360-396-0586

FRA
ENGINEERING

PROJECT FILE:
FIGURE 15 - WETLAND LOCATION MAP (WETLAND LOCATIONS L, M, N, O, & P)

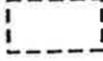
PROJECT NUMBER: IPD REZONING

TOWN OF BRIGHTON COUNTY OF MONROE

CLIENT: UNIVERSITY OF ROCHESTER

PROJECT NO. 01-2398	PROLIMER: DJA
DATE: JULY 2007	DRAWN BY: NEB
SCALE: 1"=100'	CHECKED BY: DJA
DRAWING NO. WL-2	
SHEET NO. 2 of 6	

LEGEND

-  TOWN OF BRIGHTON LANDS (27.20 ACRES)
-  U OF R OWNED LANDS (230.03 TOTAL ACRES)
-  WETLAND LIMIT
-  POD LIMIT

• NOTE: THERE ARE NO DELINEATED WETLANDS B,F,H,I



"G" WETLANDS
AREA = 412,141 S.F.
9.46 ACRES

NORMAN ROAD

24" BOX
CULVERT

OLD RR GRADE

OLD RR GRADE

530

530

530

530

535

540

PARKING

7

5

6

3

MATCH LINE DWG. NO. WL-4

UNAUTHORIZED REVISION OR ADDITION TO THIS DRAWING IS A VIOLATION OF THE PROFESSIONAL ENGINEERING ACT, ARTICLE 145, SECTION 7209

NO.	DATE	DESCRIPTION	REVISIONS
1			
2			
3			

DATE

630 BLAUNT POINT DRIVE
ROCHESTER, NY 14107
935/358-0280



FPA
ENGINEERING

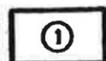
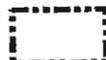
**FIGURE 15 - WETLAND LOCATION MAP
(WETLAND LOCATIONS G)**

PROJECT NAME: IPD REZONING
TOWN OF BRIGHTON COUNTY OF ROCHESTER

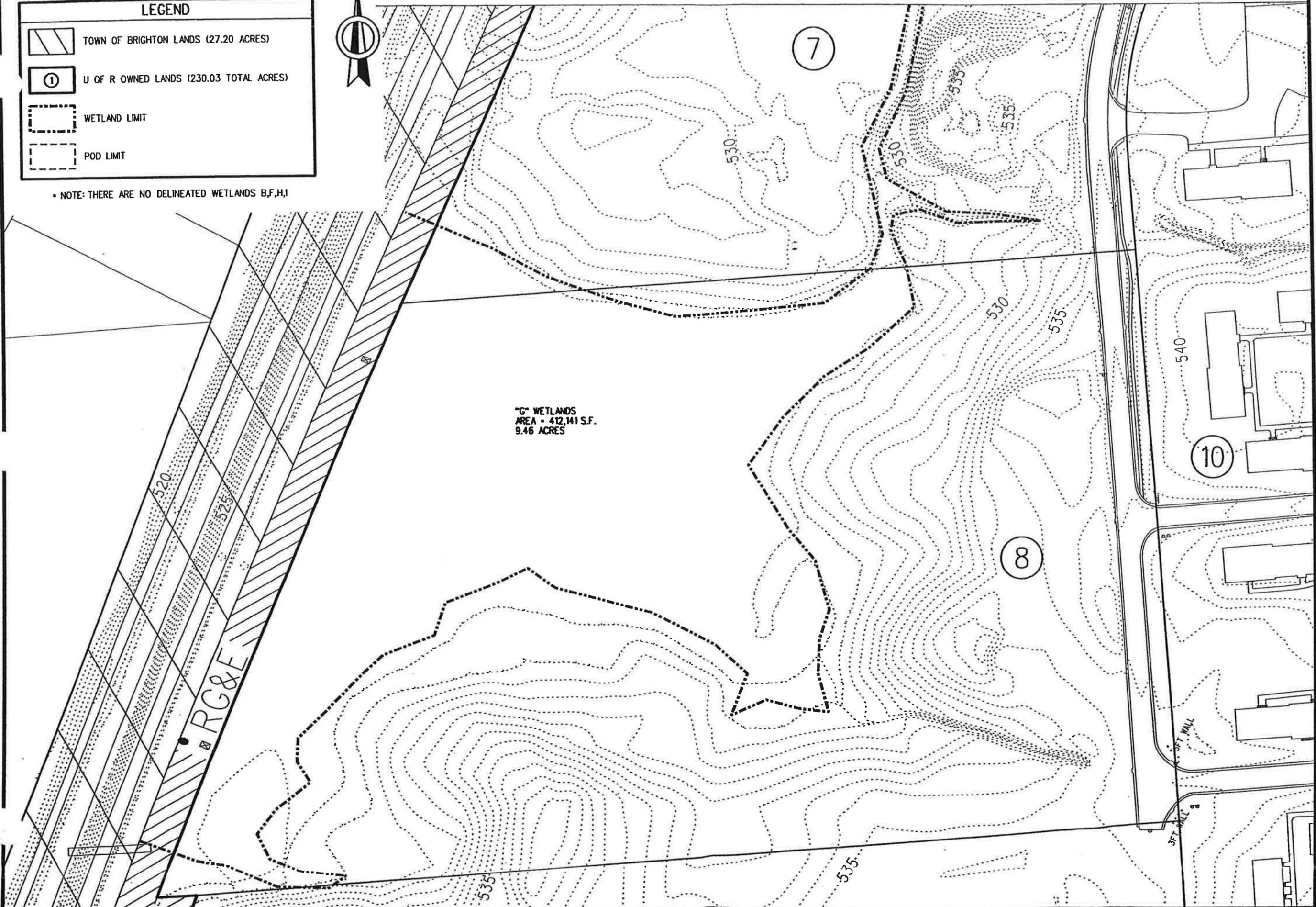
CITY: UNIVERSITY OF ROCHESTER

PROJECT NO:	01-2398	PROJECT BY:	DJA
DATE:	JULY 2007	DRAWN BY:	NEB
SCALE:	1" = 100'	CHECKED BY:	DJA
DRAWING NO.:	WL-3		
SHEET NO.:	3		6

LEGEND

-  TOWN OF BRIGHTON LANDS (27.20 ACRES)
-  U OF R OWNED LANDS (230.03 TOTAL ACRES)
-  WETLAND LIMIT
-  POD LIMIT

• NOTE: THERE ARE NO DELINEATED WETLANDS B,F,H,I



UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF NEW YORK STATE EDUCATION LAW ARTICLE 140, SECTION 1403

NO.	DATE	DESCRIPTION	REVISIONS
1			
2			
3			

DATE _____

510 SUHANT MOUNT DRIVE
ROCHESTER, NY 14457
585/356-0280



FRA
ENGINEERING

FIGURE 15 - WETLAND LOCATION MAP (WETLAND LOCATIONS G)

PROJECT NAME: IPD REZONING
TOWN OF BRIGHTON
COUNTY OF MONROE

CLIENT: UNIVERSITY OF ROCHESTER

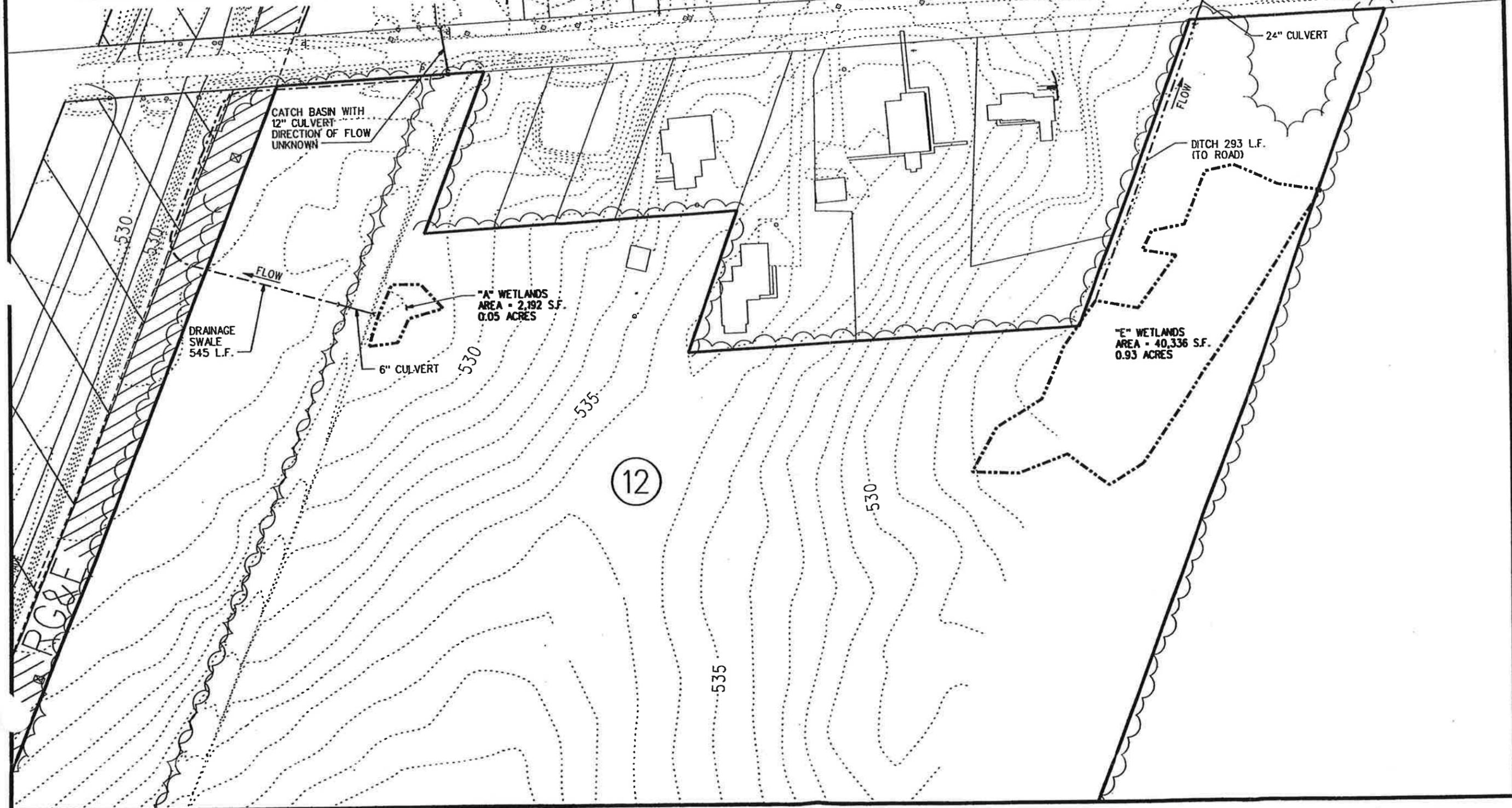
PROJECT NO:	01-2398	DRAWN BY:	DJA
DATE:	JULY 2007	CHECKED BY:	NEB
SCALE:	1"=100'	DESIGNED BY:	DJA
DRAWING NO.:	WL-4		
SHEET NO.:	4	OF	6

LEGEND

-  TOWN OF BRIGHTON LANDS (27.20 ACRES)
-  U OF R OWNED LANDS (230.03 TOTAL ACRES)
-  WETLAND LIMIT
-  POD LIMIT



NOTE: THERE ARE NO DELINEATED WETLANDS B,F,H,I



UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF NEW YORK STATE EDUCATION LAW ARTICLE 148, SECTION 7009

NO.	DATE	DESCRIPTION	REVISIONS
1			
2			
3			

DATE _____

530 SUMMIT POINT DRIVE
KENNETHA, NY 14467
585/358-0280



FPA
ENGINEERING

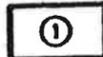
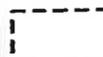
PROJECT FILE: 15 - WETLAND LOCATION MAP
FIGURE (WETLAND LOCATIONS A & E)

PROJECT NAME: IPD REZONING
TOWN OF BRIGHTON
COUNTY OF MONROE

CLIENT: UNIVERSITY OF ROCHESTER

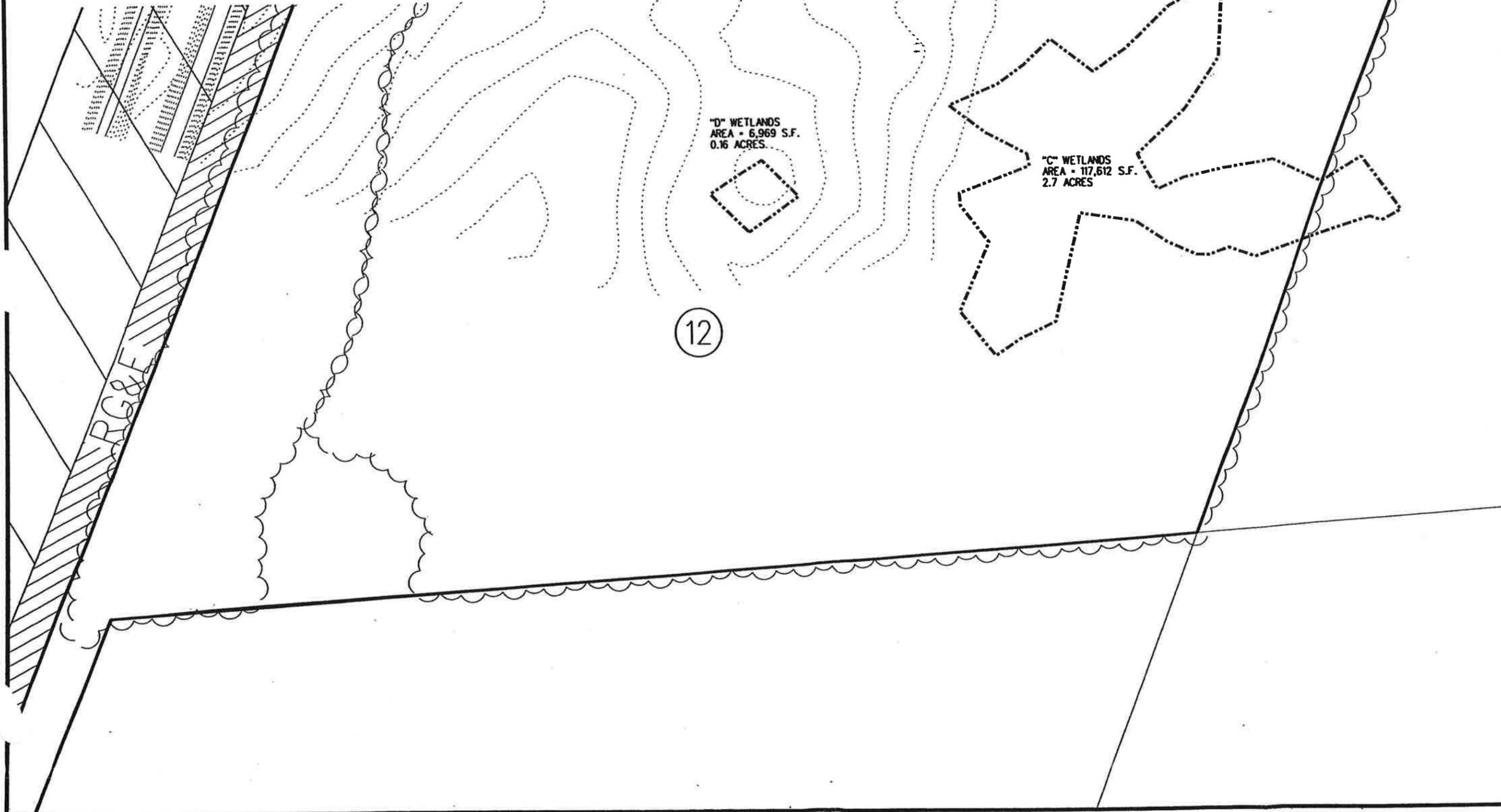
PROJECT NO:	01-2398	PROJ. MGR.:	DJA
DATE:	JULY 2007	DRW. BY:	NEB
SCALE:	1"=100'	CHECK BY:	DJA
DRAWING NO:	WL-5		
SHEET NO:	5 of 6		

LEGEND

-  TOWN OF BRIGHTON LANDS (27.20 ACRES)
-  U OF R OWNED LANDS (230.03 TOTAL ACRES)
-  WETLAND LIMIT
-  POD LIMIT



- NOTE: THERE ARE NO DELINEATED WETLANDS B,F,H,I



UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF NEW YORK STATE EDUCATION LAW ARTICLE 142, SECTION 7003

NO.	DATE	DESCRIPTION	REVISIONS
3			
2			
1			

DATE

530 SUMMIT STREET, SUITE 1447
ROCHESTER, NY 14607
585.7559-3280



JPA
ENGINEERING

DRAWING TITLE: FIGURE 15 - WETLAND LOCATION MAP (WETLAND LOCATIONS: C & D)

PROJECT NAME: IPD REZONING

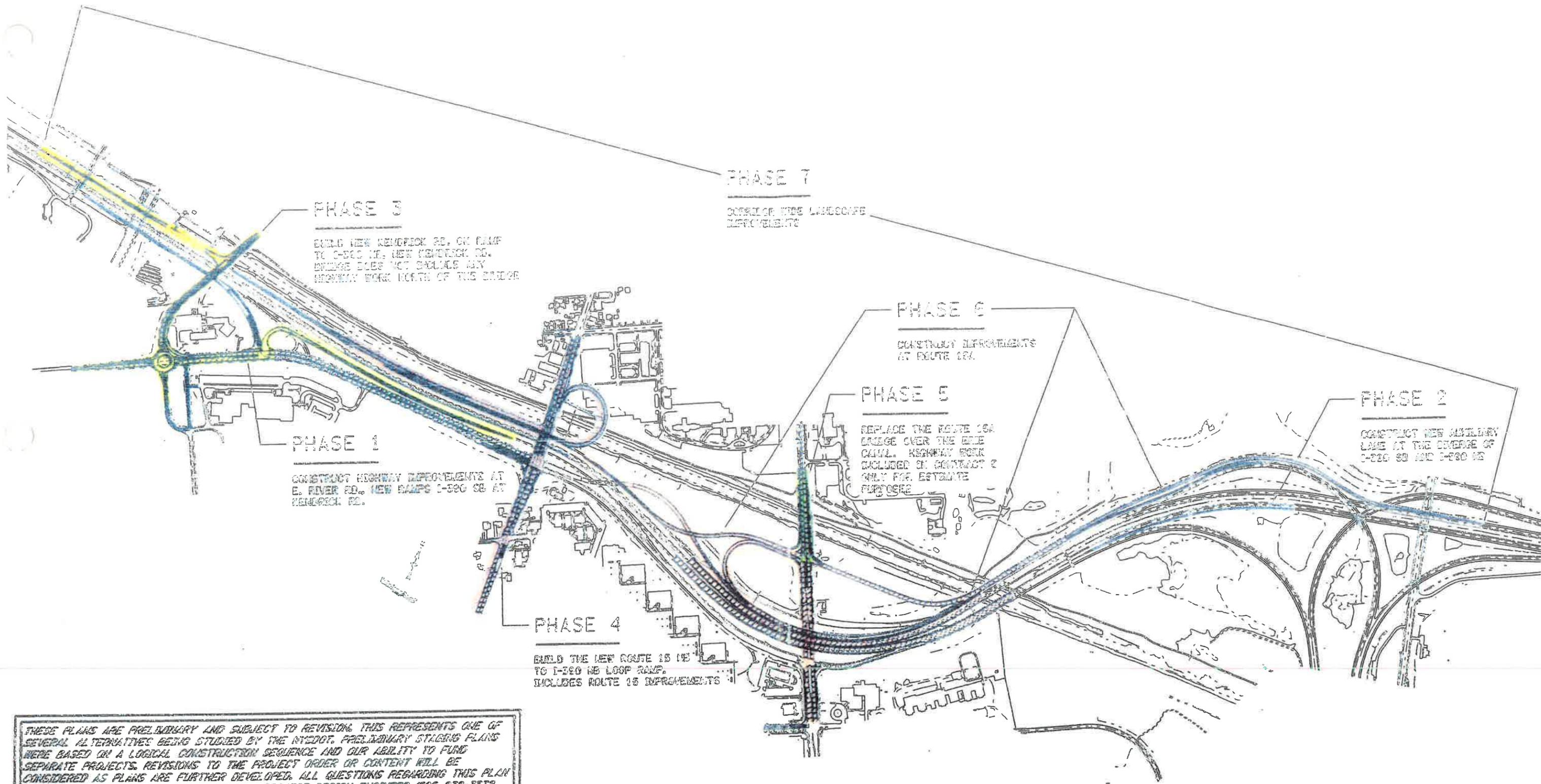
TOWN OF BRIGHTON
COUNTY OF MONROE

CLIENT: UNIVERSITY OF ROCHESTER

PROJECT NO.: 01-2398	PROJECT MGR.: DJA
DATE: JULY 2007	DRAWN BY: NEB
SCALE: 1"=100'	CHECKED BY: DJA
DRAWING NO.: WL-6	
SHEET NO.: 6 of 6	

APPENDIX D

NYS DOT's I-390 Plan



PHASE 3

BUILD NEW HENDRICK SB. ON RAMP TO I-190 NB. NEW HENDRICK SB. BRIDGE DOES NOT INCLUDE ANY HIGHWAY WORK NORTH OF THE BRIDGE

PHASE 7

SURFACE WIDE LANDSCAPE IMPROVEMENTS

PHASE 6

CONSTRUCT IMPROVEMENTS AT ROUTE 16A

PHASE 5

REPLACE THE ROUTE 16A BRIDGE OVER THE ERIE CANAL. HIGHWAY WORK EXCLUDED IN CONTRACT 2 ONLY FOR ESTIMATE PURPOSES

PHASE 2

CONSTRUCT NEW AUXILIARY LANE AT THE CONVERGE OF I-190 SB AND I-190 NB

PHASE 1

CONSTRUCT HIGHWAY IMPROVEMENTS AT E. RIVER RD. NEW RAMP I-190 SB AT HENDRICK RD.

PHASE 4

BUILD THE NEW ROUTE 15 NB TO I-190 NB LOOP RAMP. INCLUDES ROUTE 15 IMPROVEMENTS

THESE PLANS ARE PRELIMINARY AND SUBJECT TO REVISION. THIS REPRESENTS ONE OF SEVERAL ALTERNATIVES BEING STUDIED BY THE NYSDOT. PRELIMINARY STAGING PLANS WERE BASED ON A LOGICAL CONSTRUCTION SEQUENCE AND OUR ABILITY TO FUND SEPARATE PROJECTS. REVISIONS TO THE PROJECT ORDER OR CONTENT WILL BE CONSIDERED AS PLANS ARE FURTHER DEVELOPED. ALL QUESTIONS REGARDING THIS PLAN SHOULD BE DIRECTED TO HOWARD RESSSEL, PROJECT DESIGN ENGINEER (605) 272-3372, HRESSSEL@DOT.STATE.NY.US, 1530 JEFFERSON ROAD ROCHESTER NY 14622.

ALTERNATIVES MAY BE MODIFIED BASED ON RESULTS OF TRAFFIC STUDIES, ECONOMIC, ENVIRONMENTAL AND OTHER ON-GOING STUDIES.

APPENDIX E

**Traffic Impact Study
University of Rochester – Planned Development**

U of R SDGEIS
Turning Movement Count Comparison

Traffic Volume Comparison Summary Table

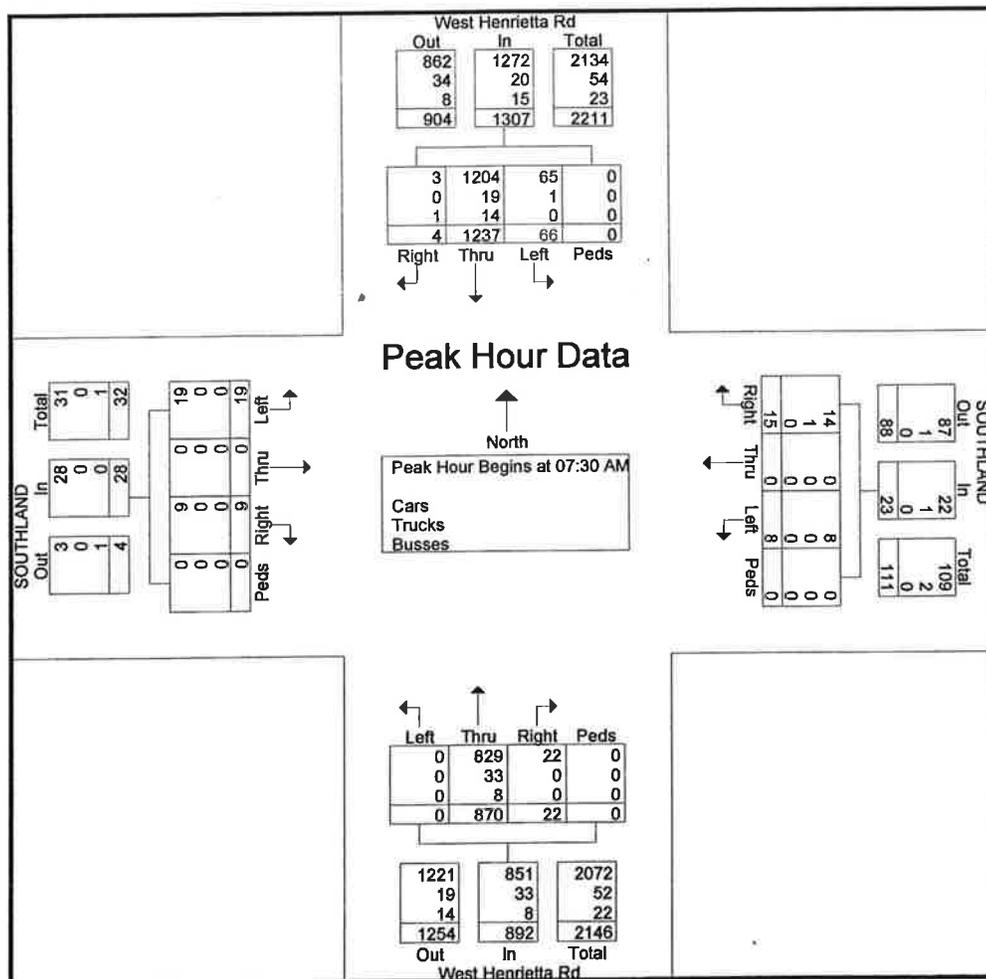
	AM Peak Hour			PM Peak Hour		
	Existing (2013 IPD) Overall Intersection Volume	12/2013 Counts Overall Intersection Volume	Percent Change w/ Existing Volume	Existing (2013 IPD) Overall Intersection Volume	12/2013 Counts Overall Intersection Volume	Percent Change w/ Existing Volume
W. Henrietta and Southland Drive						
EBL	34	19	-44%	9	9	0%
T	0	0	0%	0	0	0%
R	5	9	80%	18	6	-67%
WBL	7	8	14%	25	22	-12%
T	0	0	0%	0	0	0%
R	13	15	15%	116	62	-47%
NBL	1	0	-100%	6	2	-67%
T	1028	870	-15%	1452	1404	-3%
R	24	22	-8%	15	8	-47%
SBL	70	66	-6%	24	28	17%
T	1359	1237	-9%	1465	1300	-11%
R	<u>15</u>	<u>4</u>	<u>-73%</u>	<u>16</u>	<u>15</u>	<u>-6%</u>
Overall	2556	2250	-11.97%	3146	2856	-9.22%
W. Henrietta and Doncaster Road						
EBL	10	12	20%	3	2	-33%
T	0	3	0%	0	1	0%
R	0	4	0%	3	3	0%
WBL	3	2	-33%	14	2	-86%
T	2	0	-100%	0	0	0%
R	8	9	13%	13	7	-46%
NBL	1	1	0%	6	1	-83%
T	1035	864	-17%	1457	1416	-3%
R	2	3	50%	3	2	-33%
SBL	10	5	-50%	12	3	-75%
T	1356	1297	-4%	1480	1252	-15%
R	<u>5</u>	<u>1</u>	<u>-80%</u>	<u>16</u>	<u>14</u>	<u>-13%</u>
Overall	2432	2201	-9.50%	3007	2703	-10.11%
East River Road and Crittenden Road						
WBL	56	45	-20%	101	140	39%
R	8	8	0%	11	4	-64%
NBT	364	254	-30%	186	158	-15%
R	110	118	7%	34	35	3%
SBL	2	2	0%	12	4	-67%
T	<u>145</u>	<u>137</u>	<u>-6%</u>	<u>280</u>	<u>268</u>	<u>-4%</u>
Overall	685	564	-17.66%	624	609	-2.40%

T.Y. Lin International

255 East Avenue
Rochester, NY 14604

File Name : West Henrietta Rd & Southland_BusinessDev
Site Code : 00000000
Start Date : 12/3/2013
Page No : 2

Start Time	West Henrietta Rd Southbound					SOUTHLAND Westbound					West Henrietta Rd Northbound					SOUTHLAND Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	1	344	14	0	359	4	0	1	0	5	4	224	0	0	228	2	0	8	0	10	602
07:45 AM	1	340	21	0	362	2	0	4	0	6	7	207	0	0	214	3	0	2	0	5	587
08:00 AM	2	289	19	0	310	4	0	3	0	7	9	216	0	0	225	1	0	6	0	7	549
08:15 AM	0	264	12	0	276	5	0	0	0	5	2	223	0	0	225	3	0	3	0	6	512
Total Volume	4	1237	66	0	1307	15	0	8	0	23	22	870	0	0	892	9	0	19	0	28	2250
% App. Total	0.3	94.6	5	0		65.2	0	34.8	0		2.5	97.5	0	0		32.1	0	67.9	0		
PHF	.500	.899	.786	.000	.903	.750	.000	.500	.000	.821	.611	.971	.000	.000	.978	.750	.000	.594	.000	.700	.934
Cars	3	1204																			
% Cars	75.0	97.3	98.5	0	97.3	93.3	0	100	0	95.7	100	95.3	0	0	95.4	100	0	100	0	100	96.6
Trucks	0	19	1	0	20	1	0	0	0	1	0	33	0	0	33	0	0	0	0	0	54
% Trucks	0	1.5	1.5	0	1.5	6.7	0	0	0	4.3	0	3.8	0	0	3.7	0	0	0	0	0	2.4
Busses	1	14	0	0	15	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	23
% Busses	25.0	1.1	0	0	1.1	0	0	0	0	0	0	0.9	0	0	0.9	0	0	0	0	0	1.0

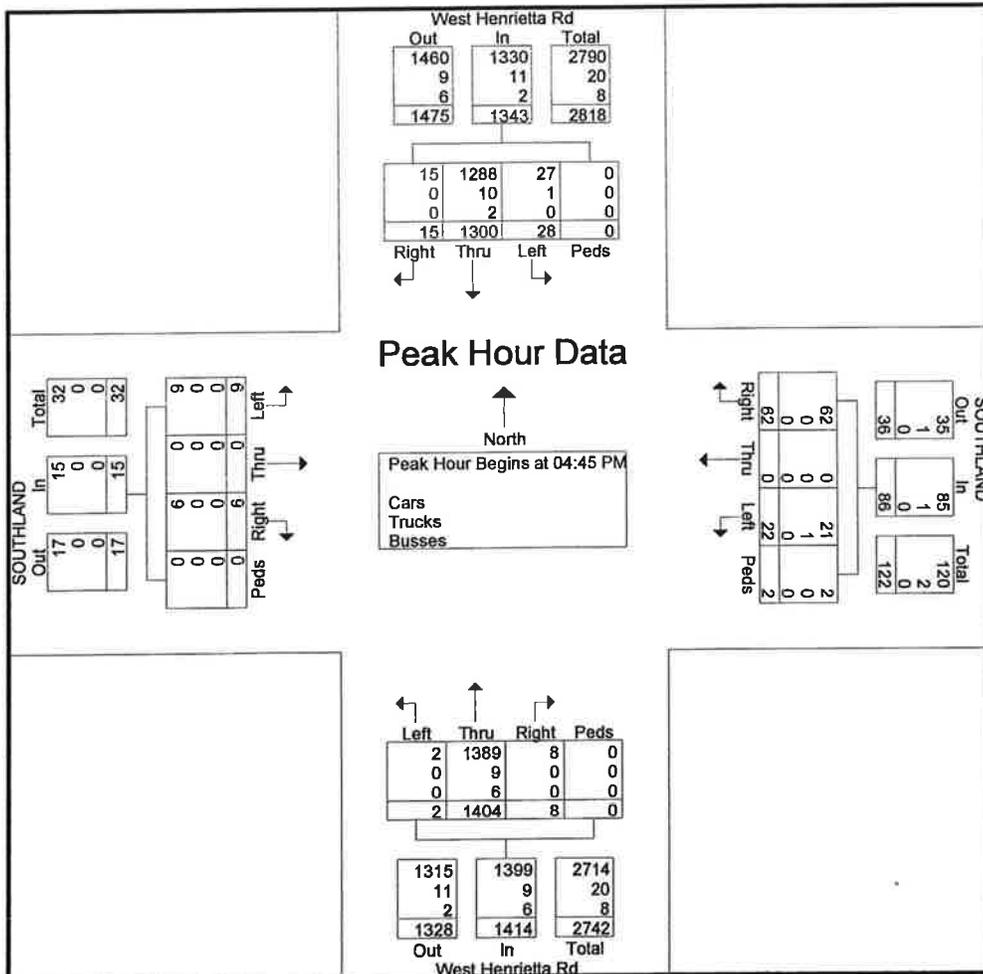


T.Y. Lin International

255 East Avenue
Rochester, NY 14604

File Name : West Henrietta Rd & Southland_BusinessDev
Site Code : 00000000
Start Date : 12/3/2013
Page No : 3

Start Time	West Henrietta Rd Southbound					SOUTHLAND Westbound					West Henrietta Rd Northbound					SOUTHLAND Eastbound					Int Total	
	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total		
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 04:45 PM																						
04:45 PM	4	330	7	0	341	14	0	5	0	19	3	395	1	0	399	1	0	1	0	2	761	
05:00 PM	3	307	6	0	316	26	0	8	2	36	3	313	0	0	316	2	0	6	0	8	676	
05:15 PM	5	338	9	0	352	11	0	4	0	15	2	343	0	0	345	0	0	0	0	0	712	
05:30 PM	3	325	6	0	334	11	0	5	0	16	0	353	1	0	354	3	0	2	0	5	709	
Total Volume	15	1300	28	0	1343	62	0	22	2	86	8	1404	2	0	1414	6	0	9	0	15	2858	
% App Total	1.1	96.8	2.1	0		72.1	0	25.6	2.3		0.6	99.3	0.1	0		40	0	60	0			
PHF	.750	.962	.778	.000	.954	.596	.000	.688	.250	.597	.667	.889	.500	.000	.886	.500	.000	.375	.000	.469	.939	
Cars	15	1288									1389									100	99.0	
% Cars	100	99.1	96.4	0	99.0	100	0	95.5	100	98.8	100	98.9	100	0	98.9	100	0	100	0	100	99.0	
Trucks	0	10	1	0	11	0	0	1	0	1	0	9	0	0	9	0	0	0	0	0	0	21
% Trucks	0	0.8	3.6	0	0.8	0	0	4.5	0	1.2	0	0.6	0	0	0.6	0	0	0	0	0	0	0.7
Busses	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	8
% Busses	0	0.2	0	0	0.1	0	0	0	0	0	0	0.4	0	0	0.4	0	0	0	0	0	0	0.3

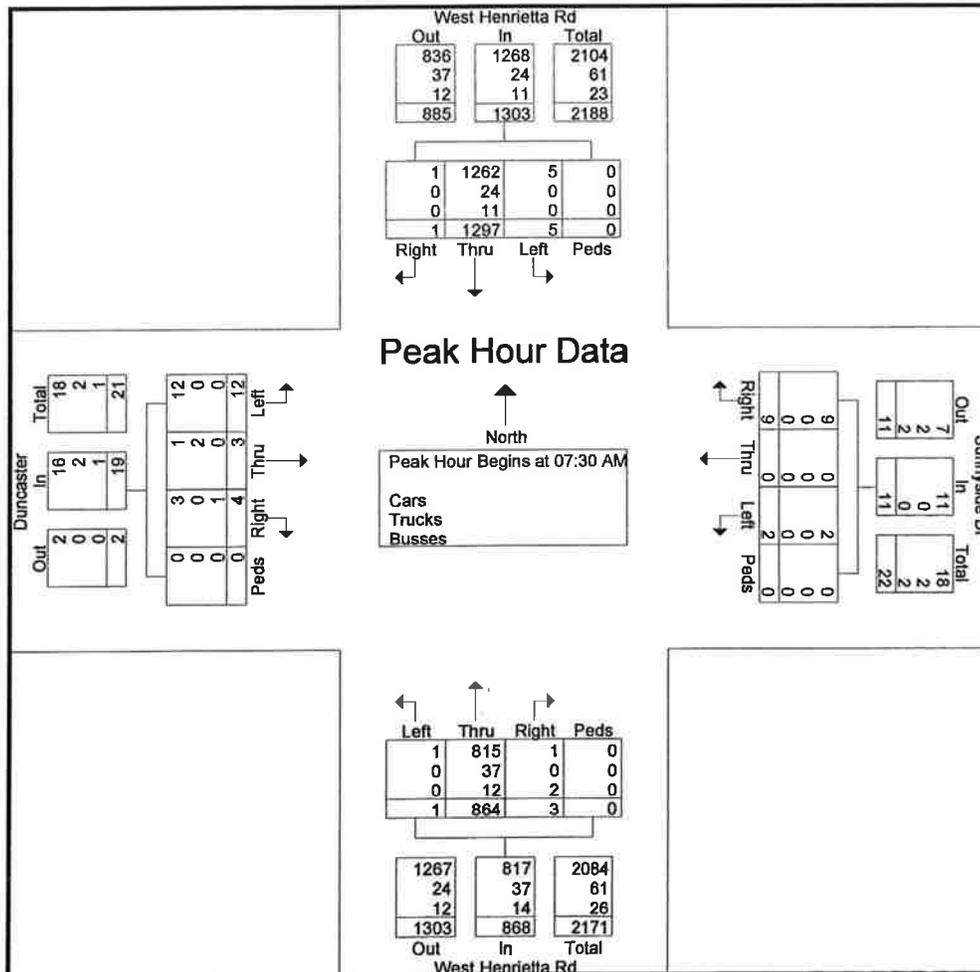


T.Y. Lin International

255 East Avenue
Rochester, NY 14604

File Name : West Henrietta Rd & Doncaster_Sunnyside Dr
Site Code : 00000000
Start Date : 12/4/2013
Page No : 2

Start Time	West Henrietta Rd Southbound					Sunnyside Dr Westbound					West Henrietta Rd Northbound					Duncaster Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	320	0	0	320	1	0	1	0	2	0	218	0	0	218	2	1	2	0	5	545
07:45 AM	0	359	2	0	361	4	0	1	0	5	2	238	0	0	240	1	0	5	0	6	612
08:00 AM	1	340	1	0	342	3	0	0	0	3	0	210	1	0	211	0	0	1	0	1	557
08:15 AM	0	278	2	0	280	1	0	0	0	1	1	198	0	0	199	1	2	4	0	7	487
Total Volume	1	1297	5	0	1303	9	0	2	0	11	3	864	1	0	868	4	3	12	0	19	2201
% App. Total	0.1	99.5	0.4	0		81.8	0	18.2	0		0.3	99.5	0.1	0		21.1	15.8	63.2	0		
PHF	.250	.903	.625	.000	.902	.563	.000	.500	.000	.550	.375	.908	.250	.000	.904	.500	.375	.600	.000	.679	.899
Cars	1	1262																			
% Cars	100	97.3	100	0	97.3	100	0	100	0	100	33.3	94.3	100	0	94.1	75.0	33.3	100	0	84.2	96.0
Trucks	0	24	0	0	24	0	0	0	0	0	0	37	0	0	37	0	2	0	0	2	63
% Trucks	0	1.9	0	0	1.8	0	0	0	0	0	0	4.3	0	0	4.3	0	66.7	0	0	10.5	2.9
Busses	0	11	0	0	11	0	0	0	0	0	2	12	0	0	14	1	0	0	0	1	26
% Busses	0	0.8	0	0	0.8	0	0	0	0	0	66.7	1.4	0	0	1.6	25.0	0	0	0	5.3	1.2

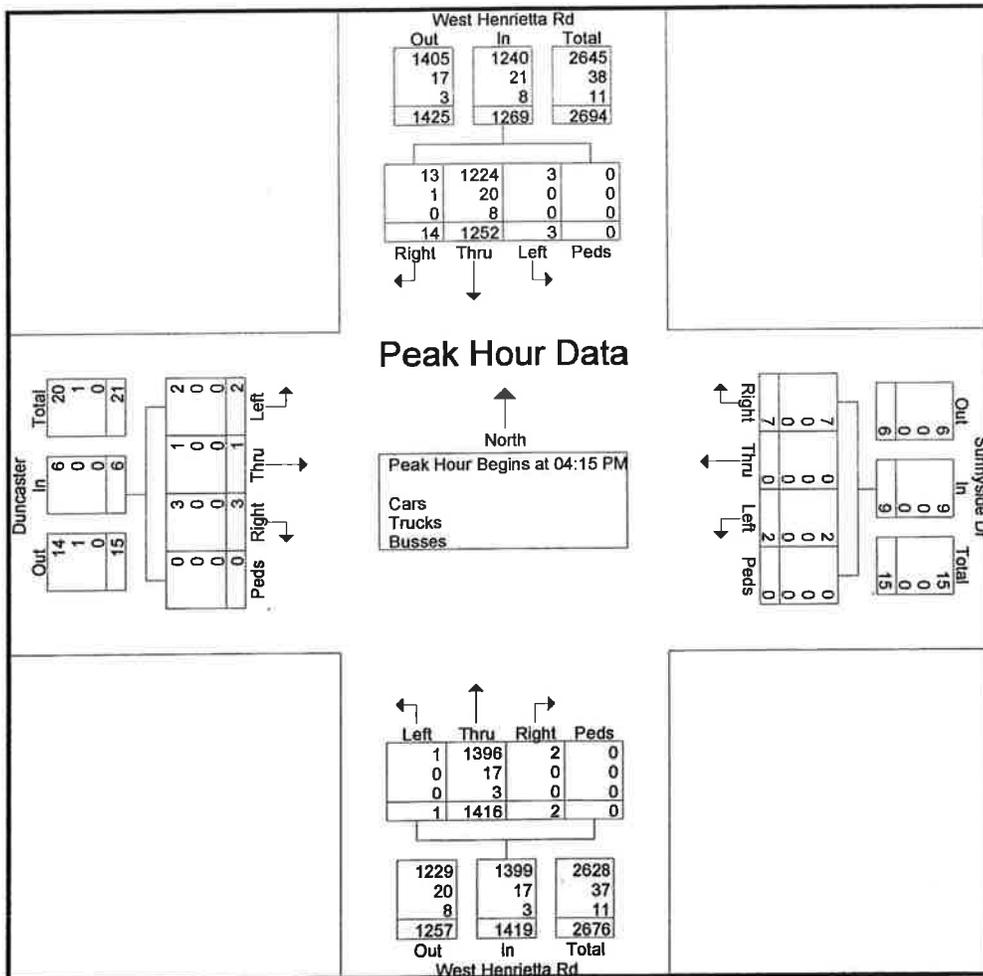


T.Y. Lin International

255 East Avenue
Rochester, NY 14604

File Name : West Henrietta Rd & Doncaster_Sunnyside Dr
Site Code : 00000000
Start Date : 12/4/2013
Page No : 3

Start Time	West Henrietta Rd Southbound					Sunnyside Dr Westbound					West Henrietta Rd Northbound					Doncaster Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 12:00 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	4	264	1	0	269	0	0	0	0	0	0	352	0	0	352	0	0	0	0	0	621
04:30 PM	2	313	2	0	317	2	0	1	0	3	1	354	1	0	356	0	0	1	0	1	677
04:45 PM	4	351	0	0	355	4	0	1	0	5	0	353	0	0	353	1	1	1	0	3	716
05:00 PM	4	324	0	0	328	1	0	0	0	1	1	357	0	0	358	2	0	0	0	2	689
Total Volume	14	1252	3	0	1269	7	0	2	0	9	2	1416	1	0	1419	3	1	2	0	6	2703
% App. Total	1.1	98.7	0.2	0		77.8	0	22.2	0		0.1	99.8	0.1	0		50	16.7	33.3	0		
PHF	.875	.892	.375	.000	.894	.438	.000	.500	.000	.450	.500	.992	.250	.000	.991	.375	.250	.500	.000	.500	.944
Cars	13	1224										1396				100	100	100	0	100	98.2
% Cars	92.9	97.8	100	0	97.7	100	0	100	0	100	100	98.6	100	0	98.6	100	100	100	0	100	98.2
Trucks	1	20	0	0	21	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	38
% Trucks	7.1	1.6	0	0	1.7	0	0	0	0	0	0	1.2	0	0	1.2	0	0	0	0	0	1.4
Busses	0	8	0	0	8	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	11
% Busses	0	0.6	0	0	0.6	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0.4

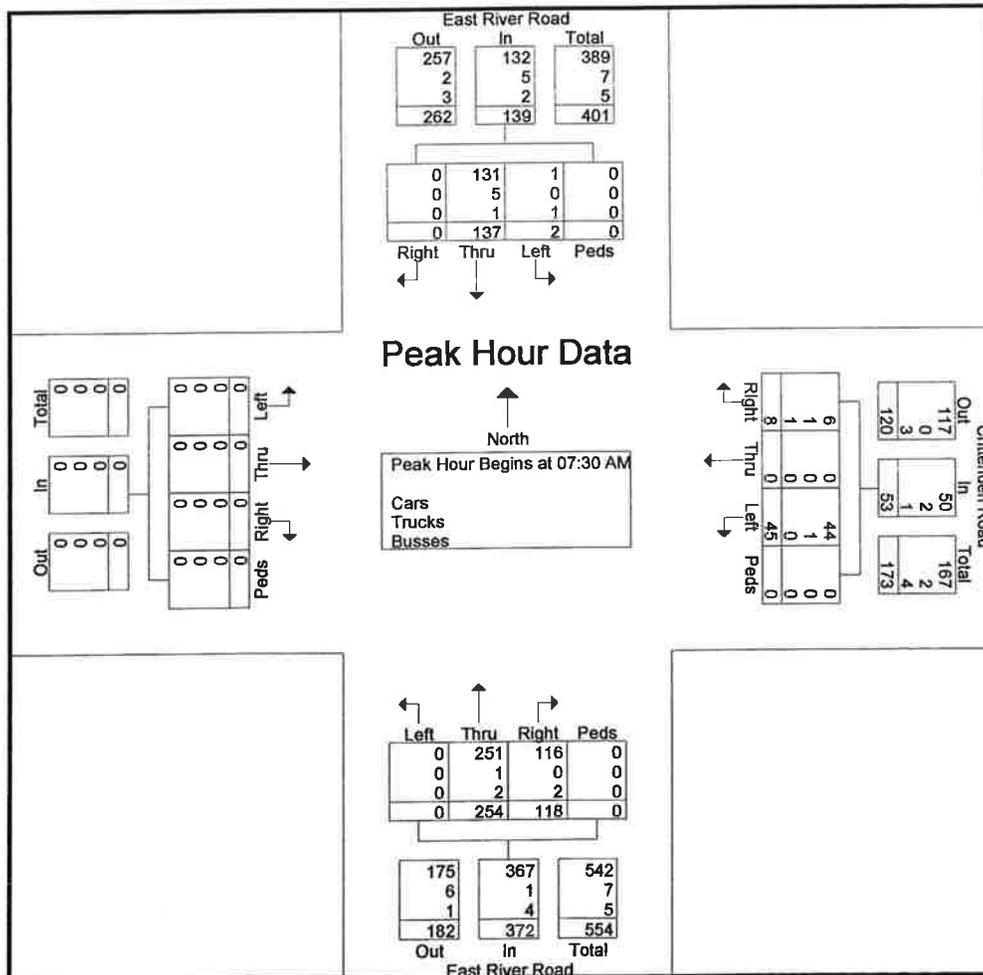


T.Y. Lin International

255 East Avenue
Rochester, NY 14604

File Name : East River Rd & Crittenden Rd AM Peak
Site Code : 00000000
Start Date : 12/3/2013
Page No : 2

Start Time	East River Road Southbound					Crittenden Road Westbound					East River Road Northbound					Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	29	0	0	29	2	0	9	0	11	38	70	0	0	108	0	0	0	0	0	148
07:45 AM	0	37	0	0	37	2	0	12	0	14	41	67	0	0	108	0	0	0	0	0	159
08:00 AM	0	34	2	0	36	2	0	19	0	21	23	65	0	0	88	0	0	0	0	0	145
08:15 AM	0	37	0	0	37	2	0	5	0	7	16	52	0	0	68	0	0	0	0	0	112
Total Volume	0	137	2	0	139	8	0	45	0	53	118	254	0	0	372	0	0	0	0	0	564
% App. Total	0	98.6	1.4	0	15.1	0	84.9	0	31.7	68.3	0	0	0	0	86.1	0	0	0	0	0	88.7
PHF	.000	.926	.250	.000	.939	1.000	.000	.592	.000	.631	.720	.907	.000	.000	.861	.000	.000	.000	.000	.000	.887
Cars	0	131	1	0	132	6	0	44	0	50	116	251	0	0	367	0	0	0	0	0	549
% Cars	0	95.6	50.0	0	95.0	75.0	0	97.8	0	94.3	98.3	98.8	0	0	98.7	0	0	0	0	0	97.3
Trucks	0	5	0	0	5	1	0	1	0	2	0	1	0	0	1	0	0	0	0	0	8
% Trucks	0	3.6	0	0	3.6	12.5	0	2.2	0	3.8	0	0.4	0	0	0.3	0	0	0	0	0	1.4
Busses	0	1	1	0	2	1	0	0	0	1	2	2	0	0	4	0	0	0	0	0	7
% Busses	0	0.7	50.0	0	1.4	12.5	0	0	0	1.9	1.7	0.8	0	0	1.1	0	0	0	0	0	1.2

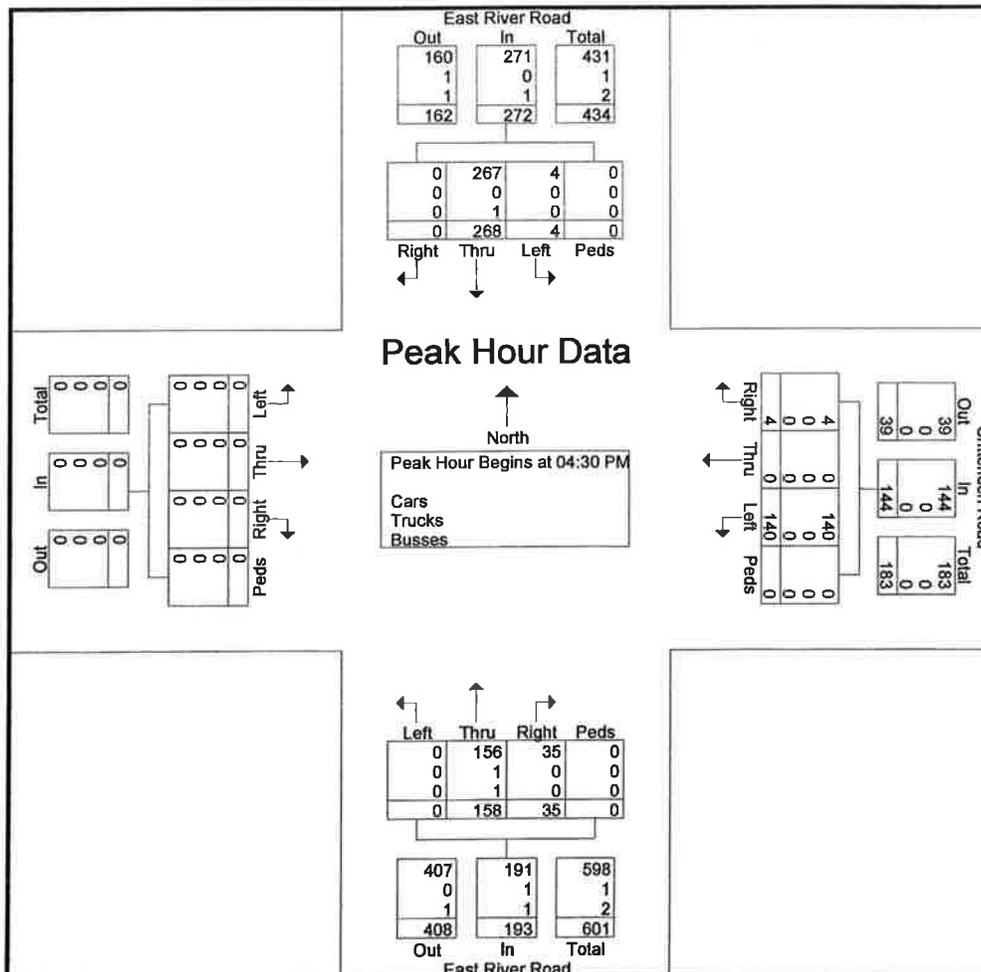


T.Y. Lin International

255 East Avenue
Rochester, NY 14604

File Name : East River Rd & Crittenden Rd PM Peak
Site Code : 00000000
Start Date : 12/3/2013
Page No : 2

Start Time	East River Road Southbound					Crittenden Road Westbound					East River Road Northbound					Eastbound					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	62	0	0	62	0	0	28	0	28	12	36	0	0	48	0	0	0	0	0	138
04:45 PM	0	67	3	0	70	0	0	41	0	41	8	50	0	0	58	0	0	0	0	0	169
05:00 PM	0	76	0	0	76	3	0	36	0	39	8	45	0	0	53	0	0	0	0	0	168
05:15 PM	0	63	1	0	64	1	0	35	0	36	7	27	0	0	34	0	0	0	0	0	134
Total Volume	0	268	4	0	272	4	0	140	0	144	35	158	0	0	193	0	0	0	0	0	609
% App. Total	0	98.5	1.5	0		2.8	0	97.2	0		18.1	81.9	0	0		0	0	0	0		
PHF	.000	.882	.333	.000	.895	.333	.000	.854	.000	.878	.729	.790	.000	.000	.832	.000	.000	.000	.000	.000	.901
Cars	0	267	4	0	271	4	0	140	0	144	35	156	0	0	191	0	0	0	0	0	606
% Cars	0	99.6	100	0	99.6	100	0	100	0	100	100	98.7	0	0	99.0	0	0	0	0	0	99.5
Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0.5	0	0	0	0	0	0.2
Busses	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Busses	0	0.4	0	0	0.4	0	0	0	0	0	0	0.6	0	0	0.5	0	0	0	0	0	0.3



Traffic Impact Study

University of Rochester Institutional Planned Development

Town of Brighton, New York
December 2013

PREPARED FOR:

University of Rochester
612 Wilson Boulevard
Rochester, New York 14627

PREPARED BY:

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TY·LININTERNATIONAL
engineers | planners | scientists

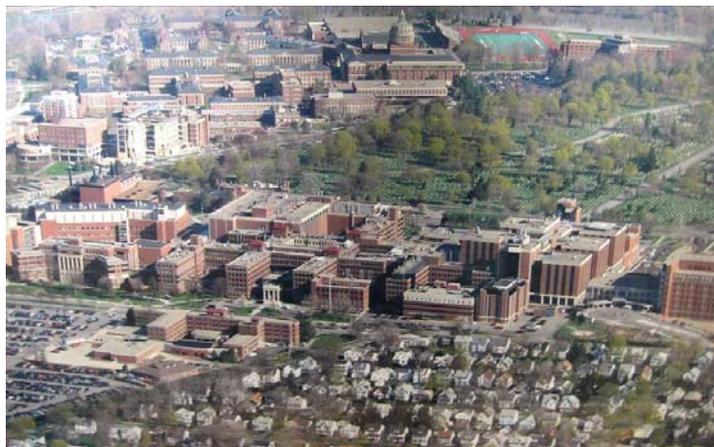


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EXECUTIVE SUMMARY

The University of Rochester (University) is proposing to update the Institutional Planned Development District in the Town of Brighton in support of the overall long-range, University Campus Master Plan that was completed in 2009 and adopted by the University.

This Traffic Impact Study (TIS) replaces the TIS completed for the DGEIS in 2004 prepared by T.Y. Lin International. The TIS includes an evaluation of the short-range (5-year) development and the long range full build development (20-year analysis) within the Study Area (refer to **Figure 1**). The portion of the University of Rochester’s Campus Master Plan (Master Plan) that is evaluated in this study includes the South Campus, the Medical Center/Mid-Campus and the River Campus. The concept site plan for the South Campus Master Plan is included in **Appendix ‘A’**. For the purpose of this study, the full build timeframe is 20-years. However, specific projects and future growth plans are unknown beyond the 5-year timeframe.

Since completion of the DGEIS, the University has completed work on two major initiatives: development on a new strategic plan and a comprehensive master plan. The two plans have been developed in concert, resulting in a Master Plan that is complementary with the objectives of the strategic plan addressing the quality and growth of the University.

The full build-out of the University of Rochester has been envisioned in the University of Rochester Campus Master Plan. It considers the development of approximately 5 million square feet of new research, clinical, academic and residential growth over the next 20 years, primarily focusing on the Mid-Campus/Medical Center area (in the City of Rochester). It also addresses potential build out of the South Campus (in the Town of Brighton). In addition to the future expansion to the Laser Lab, near term plans include the construction of an up to four story, 130,000 square foot building on East River Road for outpatient clinical use (referenced above). The future build out of South Campus includes 1.29 million square feet of office, research and clinical care and 476,400 square feet of residential buildings. The development was translated to vehicular trips generated by each building type, resulting in an overall number of trips to be generated upon full build out of the South Campus.

This traffic impact study has examined the impacts of the potential future development on the adjacent transportation network. In order to more accurately model the relevant area of the transportation network over a 20 year span, the Town of Brighton, City of Rochester, Monroe County Department of Transportation (MCDOT), New York State Department of Transportation (NYSDOT) and the Genesee Transportation Council (GTC) were contacted to identify planned infrastructure improvements and known

Since 2004, additional studies have been completed and approved for other projects within the area. The TIS for City Gate Development (southeast corner of Westfall and East Henrietta Road) has been approved by Monroe County Department of Transportation (MCDOT) and is included in the background analysis for this study. Additionally, New York State Department of Transportation (NYSDOT) has finalized their Design Report and obtained approval to reconstruct the I-390 interchanges at East Henrietta Road, West Henrietta Road and East River Road. The TIS completed in 2010 for the University's Master Plan was incorporated into the NYSDOT's Design report as it relates to the street network adjacent to the I-390 project. The preferred alternative progressed by NYSDOT includes a new I-390 NB on-ramp at Kendrick Road, a new I-390 SB on-ramp at East River Road and a roundabout at the intersection of Kendrick Road and East River Road. The I-390 reconstruction project will improve traffic flow and relieve congestion in the Routes 15/15A corridors. Additionally, a growth rate of 1.5 percent per year (for the first 5 years) and 0.5 percent per year (for the following 15 years) to formulate a Background Growth scenario for the East Henrietta Corridor and a growth rate of 1.0 percent per year was applied to the balance of the intersections within network.

The existing Traffic/Transportation Network described in the DGEIS remains the same, with minor modifications as outlined below:

- East River Road: NYS DOT is currently constructing a new southbound on-ramp to I-390, a roundabout at the intersection of Kendrick Road and East River Road, and associated roadway improvements. Work will be completed in 2013.
- Kendrick Road: NYS DOT is currently designing a new northbound on-ramp to I-390. Work will be completed in 2014.

The transportation model used reflected NYSDOT planned infrastructure improvements in order to account for likely changes in travel patterns and increases or decreases in the number of vehicles as a result of the new patterns.

The results of this traffic study have identified specific infrastructure improvements to selected intersections, which is correlated to the year and the amount of development that may occur. This study will help guide the amount of development that could occur on the UR South Campus, as the NYSDOT improvements are phased into place, thus avoiding the need for UR to provide highway mitigation measures. Further, when a threshold has been crossed (i.e.; decreasing the Level of Service of an intersection from ‘E’ to ‘F’ or worse), specific improvements have been identified that would mitigate the impacts and restore Levels of Service to acceptable levels.

This study should be viewed as a baseline for consideration in the rezoning application before the Town of Brighton, recognizing that, at some point, future development on the South Campus property will trigger the need for a specific traffic impact study prior to issuance of municipal approvals.

Due to the complexity of this study, and the many assumptions which may or may not come to fruition as scheduled, this study should be viewed as it was intended, i.e., to provide a planning level look at the impacts associated with the South Campus development, versus a typical traffic impact study that would be used for consultation in determining site plan or roadway permit approvals.

In April 2010, the University Planned Development District #10 was approved by the City of Rochester. Because specific projects and future growth plans are unknown beyond the 5-year timeframe, the PD #10 Ordinance approved by the City includes the following traffic impact study language in the review and approval section for future building projects: “. . . **the 2010 PD #10 Traffic Impact Study shall be updated or replaced every five years, commencing in 2015.**” Additionally, the University will continually work with the reviewing agencies in both the Town and the City during site plan approval processes for individual building applications to ensure that the anticipated traffic improvements outlined in this study are on track as the future growth of the University evolves.

5 Year Plan

The following is a summary of projects that are currently under construction or in the planning and implementation phases:

- South Campus – Imaging Building – on easterly drive at River Road.
- Medical Center Campus – Clinical Transitional Science Building – on Crittenden Boulevard,
- Medical Center Campus - the Prism Building – on Elmwood Avenue to the west of the U of R Main Hospital Drive,
- River Campus - Warner School, - construction of academic building
- College Town – mixed-used office, residential, retail, and recreational space – on Mount Hope Avenue between Crittenden Boulevard and Elmwood Avenue.

The Phase 1 development program located in the City of Rochester is shown in **Figure ES-1** and the concept plan for South Campus, located in the Town of Brighton is shown in **Figure ES-3**.

Full Build – 20 Years

The full build-out of the University of Rochester has been envisioned in the University Campus Master Plan. It considers University expansion of approximately 5 million square feet of new research, clinical, academic and residential development over the next 20-plus years, primarily focusing on the Mid-Campus/Medical Center area in the City of Rochester. An excerpt of the proposed 20-year Master Plan development plan, prepared by the University Master Plan Team¹, for the development is shown in **Figure ES-2**.

A significant traffic data collection effort at a total of thirty-two (32) intersections has been conducted by T.Y. Lin International (TYLI) to assemble existing traffic volumes in the site vicinity within the past two years. Incorporation of other ongoing data collection efforts were also considered, including traffic data collected by NYSDOT for the City of Rochester as part of the Mt. Hope Avenue/ E. Henrietta Road Improvement Project. Known background developments, growth factors and the estimated trip generation of the development were considered and added to the existing traffic volumes to project future five-year and twenty-year (build) traffic volumes.

¹ University of Rochester; Ayers Saint Gross; Martin Alexiou Bryson

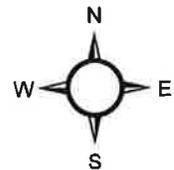
University of Rochester
City of Rochester
Planned Development

Figure ES-1:
5 YEAR
2012



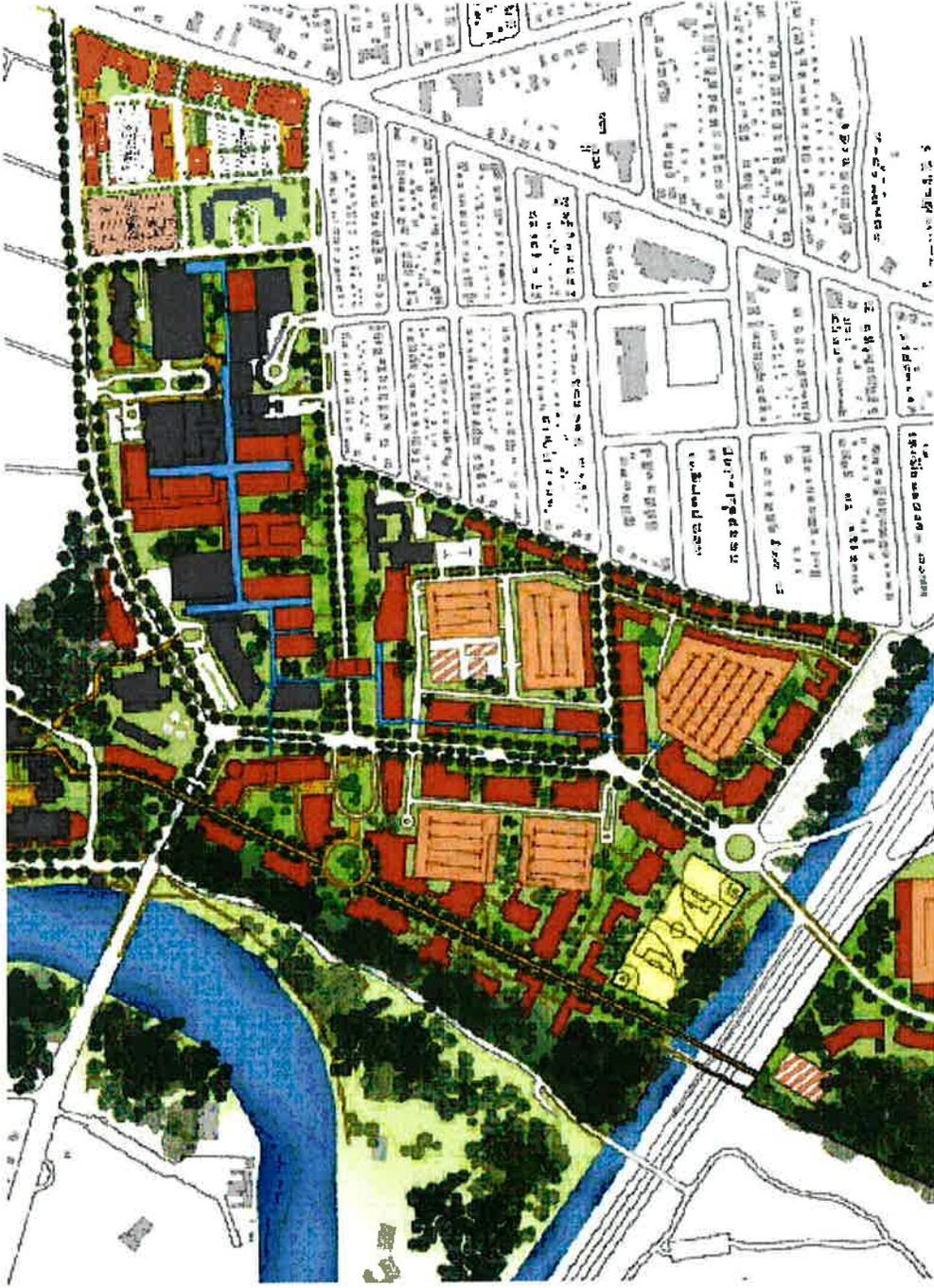
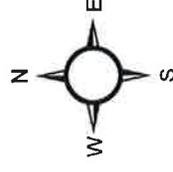
Legend

-  Town/City Boundary
-  U of R Buildings
-  U of R Parcels
-  Proposed Buildings



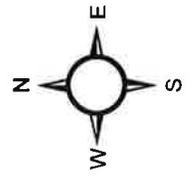
University of Rochester
City of Rochester
Planned Development

Figure ES-2:
20 YEAR
2027



University of Rochester
South Campus
Planned Development

Figure ES-3:
20 YEAR
2027



The proposed full build development is anticipated to generate a total of 4,190 and 4,152 new vehicle trips during the weekday morning and weekday evening peak hours, respectively. Each of the studied signalized intersections is anticipated to operate at a LOS equal to or better than the future background conditions for the five-year and twenty-year (build) conditions with the recommended improvements implemented.

5 Year Plan

The following is a summary of recommended improvements to accommodate the proposed development for the 5-year build condition:

East River Road & Site Drive #2:

- Widening the service road from one lane to two lanes to accommodate the queues for the northbound approach.

Improved LOS with optimization of signal timings, phasing and/or coordination at:

- Elmwood Avenue & Kendrick Road,
- Elmwood Avenue & Eastman Dental Driveway
- Elmwood Avenue & East Drive
- Elmwood Avenue @ Mt. Hope Avenue,
- Crittenden Boulevard @ Kendrick Road,
- Crittenden Boulevard @ Mt. Hope Avenue,
- Westfall Road & Mt. Hope Avenue,
- Westfall Road @ East Henrietta Road,
- East River Road & West Henrietta Road
- East River Road & I-390 Off-Ramp
- East Henrietta Road & Crittenden Road

20-year Plan

In addition to the measures recommended above for the 5-year build condition (Five Year), the following is a summary of recommended improvements to accommodate the proposed development for the twenty-year build condition:

East River Road & Site Drive #2:

- Install a two-phase coordinated traffic signal

Elmwood Avenue & Kendrick Road:

- Additional WB left-turn lane.

Westfall Road & Mt. Hope Avenue (15)

- Modify the existing 2-lane WB approach to 1 left-turn lane and a shared left-turn/through/right-turn lane.
- Split phase the eastbound and westbound movements.

The following lane configurations are recommended for the improvements proposed on East Henrietta Road by NYS DOT:

West Henrietta Road & East River Road:

- Southbound: 2-through lanes and an exclusive right turn lane.
- Westbound: 1-left turn lane, 2-through lanes and a shared through/right-turn lane.

Improved LOS with optimization of signal timings, phasing and/or coordination at:

- Elmwood Avenue & South Avenue,
- Elmwood Avenue & Kendrick Road,
- Elmwood Avenue @ Mt. Hope Avenue,
- Crittenden Boulevard @ Kendrick Road,
- Crittenden Boulevard @ Mt. Hope Avenue,
- Westfall Road & Mt. Hope Avenue,
- Westfall Road @ East Henrietta Road,
- East River Road & West Henrietta Road
- East River Road & I390 On-Ramp
- East Henrietta Road @ South Avenue
- East Henrietta Road & Iola Circle
- East Henrietta Road @ I-390 northbound on-ramp

- East Henrietta Road @ Stan Yale
- West Henrietta & Crittenden Road
- West Henrietta & Brighton Henrietta Town Line Road

Signalize traffic signals along Kendrick Road at the following intersections:

- Kendrick Road @ Alpha Road (proposed street),
- Kendrick Road @ Lattimore Avenue,
- Kendrick Road @ Westmoreland Avenue,

Revise pedestrian clearance times where appropriate.

I. INTRODUCTION

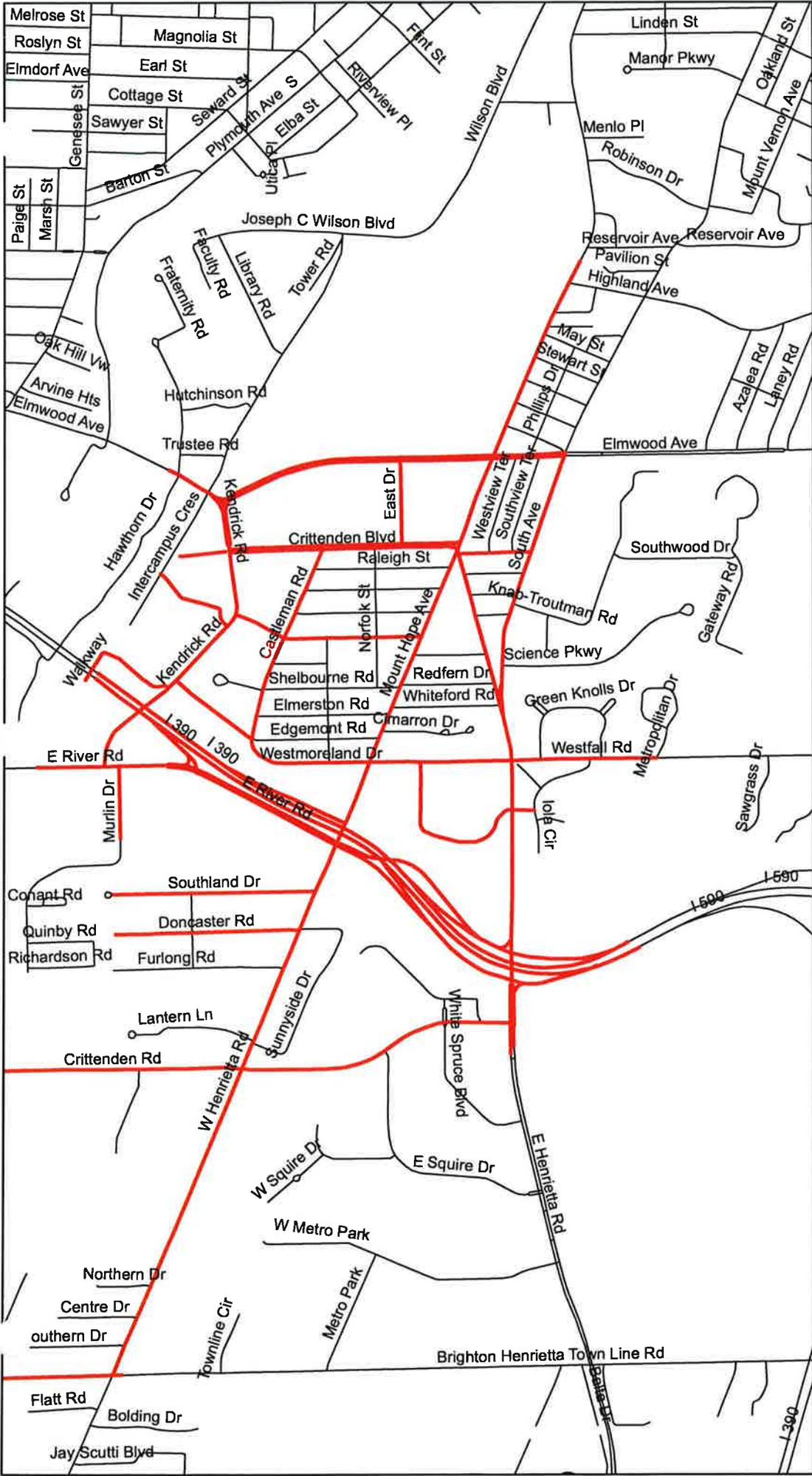
The University of Rochester (University) has updated its Planned Development District in the City of Rochester, and is proposing to update the Institutional Planned Development District in the Town of Brighton in support of the overall long-range Campus Master Plan now underway by the University. This traffic impact study report includes an evaluation of the short-range (5-year) development and the long range full build development (20-year analysis) within the Study Area (refer to **Figure 1**).

The purpose of this Traffic Impact Study Report is to evaluate the potential impacts that University growth may have on traffic operations on the surrounding street system and transportation network. This study is intended for review by the Town of Brighton, the New York State Department of Transportation (NYSDOT), the Monroe County Department of Transportation (MCDOT). The procedures in this study conform to guidelines recommended by the NYSDOT Region 4 and the Institute of Transportation Engineers (ITE).

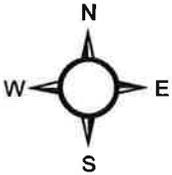
To address the potential transportation impacts of this project, the following tasks were undertaken:

- Obtained field data on the existing transportation system. Data collection included information on intersection spacing, signal timings, roadway geometrics, sight distances, speed limits, pavement conditions, and pavement striping and signing.
- Morning and evening peak hour capacity operations Level of Service (LOS) analysis was performed at a total of 32 intersections in the vicinity of the University of Rochester.
- Obtained manual turning movement counts during the following time periods:
 - Weekday Morning Peak Period 7:00AM – 9:00 AM
 - Evening Peak Period 4:00 PM – 6:00 PM
- Estimated the magnitude of vehicular trips to be generated by the proposed University developments using trip generation rates. Trips were then distributed to the study network and driveway locations.
- Evaluated the capacity and Level of Service of the existing transportation system and the impacts of the new trips generated by the proposed development using the

Figure 1:
Study
Area



Legend
— Project Location



0 500 1,000
Feet

traffic modeling software program SYNCHRO 7.0. Provided figures illustrating existing 2008, background Five Year (no-build), future build Five Year, background 20-year (no-build) and full future build (20-year) traffic volumes.

- Summarized potential impacts of the proposed developments and evaluated the need for transportation improvements and Travel Demand Management (TDM) measures.

II. PROJECT DESCRIPTION

The portion of the University of Rochester’s Campus Master Plan that is evaluated in this study consists of three locations: The South Campus, River Campus, Medical Center/Mid-Campus and the River Campus. The concept site plan for the South Campus Master Plan is included in **Appendix ‘A’**. For the purpose of this study, the full build year timeframe is 20-years. However, specific projects and future growth plans are unknown beyond the 5-year timeframe. Therefore, the University has committed to update the Traffic Impact Study every five years to ensure that the anticipated roadway improvements outlined in the TIS are relevant and beneficial.

5-year Plan

The following is a summary of University projects that are currently under construction or in the planning and implementation phases.

- South Campus – Imaging Building – on easterly drive at River Road.
- Medical Center Campus – Clinical Transitional Science Building (CTSB) – on Crittenden Boulevard to the west of Helen Wood Hall,
- Medical Center Campus - the Prism Building – On Elmwood Avenue to the west of the U of R Main Hospital Drive,
- River Campus - Warner School - construction of new academic building
- College Town – mixed-used office, residential, retail, and recreational space – On Mount Hope Avenue

A general location map for the project site and the location of the four projects noted above is shown on the following page as **Figure 1**. Construction activities began in mid-2008 with the initiation of the construction of the CTSB building, scheduled for 2011 completion. The

University anticipates completion of the PRISM, College Town and Warner School projects within the next five years.

20-year Plan

The full build-out of the University of Rochester Mid-Campus has been envisioned in the University of Rochester Campus Master Plan. An excerpt of the proposed 20-year Master Plan prepared by the University's Master Plan Team², is shown in **Figure ES-2**.

III. EXISTING ROADWAY AND AREA CONDITIONS

Transportation Network Study Area

A fairly significant transportation study area has been defined to assess transportation impacts associated with University growth. This study area is bound by the Genesee River to the west and north, Interstate I-390 to the south, and by Mt. Hope Avenue/ Castleman Road / Mt. Hope Cemetery to the east. There are several major roadways that serve the campus property including the following: Route I-390, Route 15 (West Henrietta Road/Mt. Hope Avenue), Route 15A (East Henrietta Road), Elmwood Avenue, Kendrick Road, and Crittenden Boulevard. The following is a description of major roadways and intersections within the study area. Refer to **Figure 2** for the existing lane configurations.

Roadways

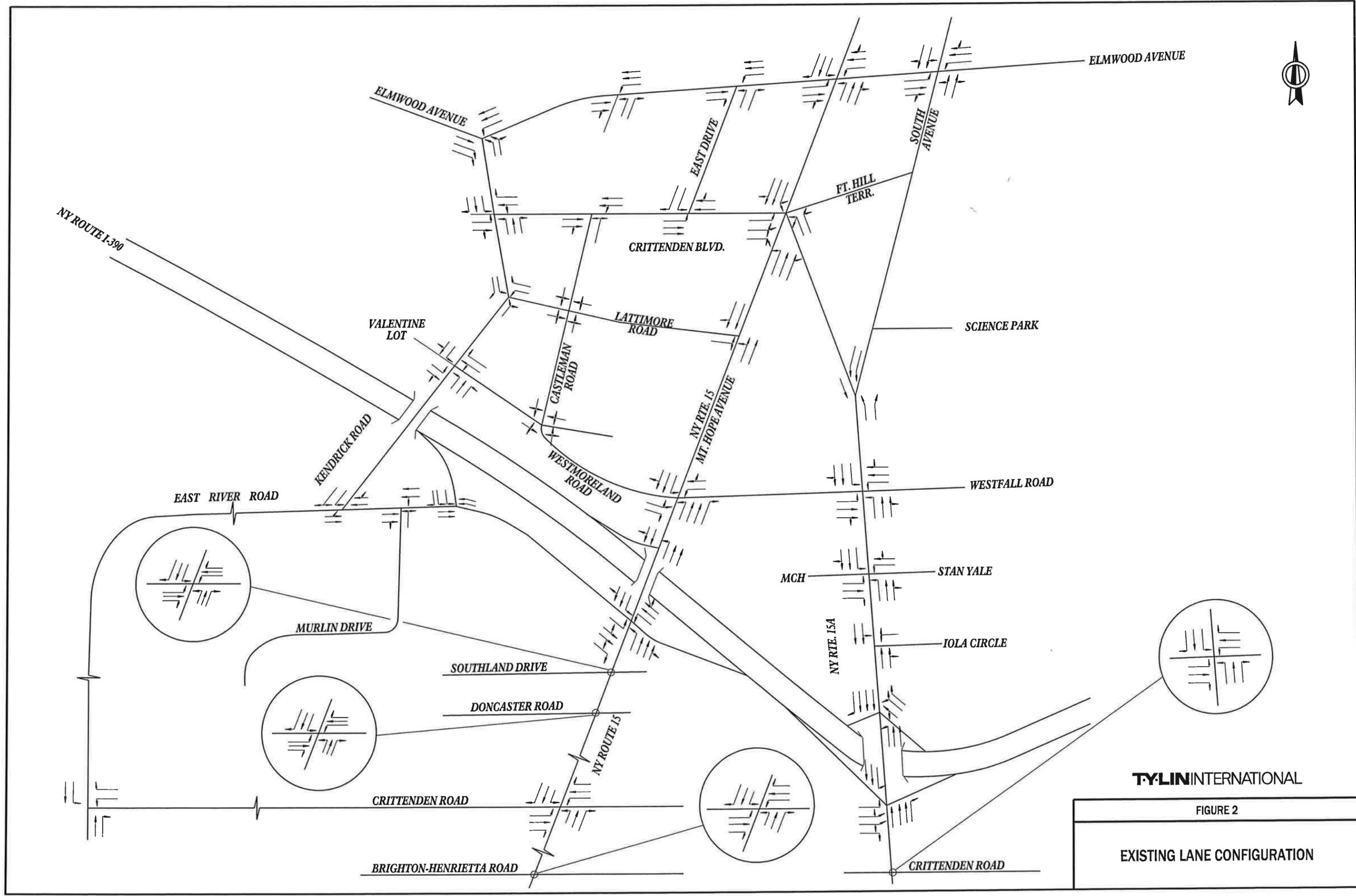
I-390:

I-390 traverses north-south in the vicinity of the site and is considered a principal arterial interstate. As documented by the New York State Department of Transportation in 2008, I-390 carried approximately 35,600 vehicles per day northbound and 40,200 vehicles per day southbound, between exit 16 (Routes 15 & 15a) and exit 17 (Route 383- Scottsville Road).

I-590:

I-590 traverses north-south in the vicinity of the site and is classified a principal arterial interstate. As documented by the New York State Department of Transportation in 2008,

² Ibid



TYLIN INTERNATIONAL

FIGURE 2

EXISTING LANE CONFIGURATION

I-590 carried approximately 37,500 vehicles per day northbound and 37,700 vehicles per day southbound, between exit 1 (Winton Road) and exit 2 (Rt. 31).

NY Route 15 (West Henrietta Road / Mt. Hope Avenue):

Route 15 traverses north-south and is classified as a principal arterial. As documented by the New York State Department of Transportation, Route 15 carried approximately 33,000 vehicles per day south of I-390 in 2008 and 19,200 vehicles per day north of I-390 in 2007.

NY Route 15A (East Henrietta Road):

Route 15A traverses north-south and is classified a minor arterial. As documented by the New York State Department of Transportation, Route 15A carried approximately 10,700 vehicles per day south of Route 15 in 2007, 30,500 vehicles per day south of South Avenue in 2009, 28,600 vehicles per day north of I-390 in 2008, and 27,100 vehicles per day south of I-390 in 2008.

Elmwood Avenue

Elmwood Avenue traverses east-west and is classified a minor arterial, As documented by the New York State Department of Transportation in 2006, Elmwood Avenue carries approximately 22,000 vehicles per day between Mt. Hope Avenue and East Drive. As documented by the Monroe County Department of Transportation in 2006, Elmwood Avenue carries approximately 25,300 vehicles per day west of Kendrick Road.

Kendrick Road

Kendrick Road traverses north-south and is classified as a minor arterial. As documented by Monroe County Department of Transportation in 2006, Kendrick Road carries approximately 13,800 vehicles per day south of Elmwood Avenue.

Crittenden Boulevard

Crittenden Boulevard traverses east-west and is classified as an urban collector street. As documented by the New York State Department of Transportation in 2006, Crittenden Boulevard carries approximately 9,700 vehicles per day between Norfolk Street and Mount Hope Avenue.

South Avenue

South Avenue traverses north-south and is classified as a minor arterial. As documented by Monroe County Department of Transportation in 2009, South Avenue carries approximately 11,509 vehicles per day north of NY Route 15A (East Henrietta Road).

Southland Drive

Southland Street is local residential road that transverses east-west. The posted speed limit is 30 mph.

Doncaster Road

Doncaster Road is local residential road that transverses east-west. The posted speed limit is 30 mph.

IntersectionsNY Route 15 (West Henrietta Road) @ Brighton-Henrietta Town Line Road:

The intersection is controlled by an actuated coordinated signal and consists of two travel lanes and exclusive left turn lanes at each approach. The posted speed limit is 40 mph on NY Route 15 and 35 mph on Brighton-Henrietta Town Line Road.

NY Route 15 (West Henrietta Road) @ Crittenden Road:

The intersection is controlled by an actuated coordinated signal and consists of two travel lanes in each direction. Exclusive left turn lanes exist on the northbound and southbound approaches. The posted speed limit is 40 mph on NY Route 15 and 35 mph on Crittenden Road.

NY Route 15 (West Henrietta Road) @ Doncaster Road:

The intersection is controlled by an actuated coordinated signal. The northbound and southbound approaches consist of two travel lanes in each direction and the minor approaches consist of one lane in each direction. The posted speed limit is 40 mph on NY Route 15 and 30 mph on Doncaster Road.

NY Route 15 (West Henrietta Road) @ Southland Drive:

The intersection is controlled by an actuated coordinated signal. The northbound and southbound approaches consist of two travel lanes in each direction. Exclusive left turn lanes exist on the northbound and southbound approaches. The westbound approach is comprised of a shared left/through lane and an exclusive right turn lane. The posted speed limit is 40 mph on NY Route 15 and 30 mph on Southland Drive.

NY Route 15 (West Henrietta Road) @ East River Road:

As documented by NYSDOT, East River Road carried approximately 18,000 vehicles per day west of NY Route 15 in 2012. The intersection is controlled by an actuated coordinated signal and consists of two travel lanes in each direction, exclusive left turn lanes at each approach, and an exclusive right turn lane on the eastbound approach. The posted speed limit is 40 mph on NY Route 15 and 35 mph on East River Road.

NY Route 15 (West Henrietta Road) @ I-390 NB On-Ramp:

The NY Route 15 on-ramp to I-390 NB (West Henrietta Road) is controlled by an actuated coordinated signal. Two travel lanes exist in the northbound and southbound directions. An exclusive left turn lane exists on the northbound approach and a shared through/right lane exists on the southbound approach.

NY Route 15 (Mt. Hope Avenue) @ Westmoreland Road/Westfall Road:

The intersection is controlled by an actuated coordinated signal and consists of two travel lanes northbound and southbound, exclusive left turn lanes on the westbound, northbound, and southbound approaches and an exclusive right turn lane on the eastbound approach. The posted speed limit is 30 mph on NY Route 15, Westmoreland Road, and Westfall Road.

NY Route 15 (Mt. Hope Avenue) @ Lattimore Road:

As documented by NYSDOT, Lattimore Road carried approximately 2,400 vehicles per day west of NY Route 15 in 2004. The T-intersection is controlled by an actuated coordinated signal and consists of two travel lanes in the northbound and southbound directions. The posted speed limit is 30 mph on NY Route 15 and Lattimore Road.

NY Route 15 (Mt. Hope Ave.) @ Crittenden Boulevard/NY Route 15A/Fort Hill Terrace:

The five legged intersection consists of two travel lanes in each direction on NY Route 15 and Crittenden Boulevard. Fort Hill Terrace is a one-way street in the eastbound direction. NY Route 15A has one travel lane in each direction; however the northbound approach widens to provide two travel lanes approaching this intersection. There are exclusive left turn lanes at the NY Route 15 and Crittenden Boulevard approaches. The intersection is controlled by an actuated coordinated signal with a posted speed limit of 30 mph.

NY Route 15 (Mt. Hope Avenue) @ Elmwood Avenue:

The intersection is controlled by an actuated coordinated signal and consists of two travel lanes in each direction with exclusive left turn lanes on each approach. The posted speed limit is 30 mph.

NY Route 15A (East Henrietta Road) @ Crittenden Road/MCC:

The intersection is controlled by an actuated coordinated signal and consists of two travel lanes in each direction. Exclusive left turn lanes exist on the eastbound, northbound, and southbound approaches. The posted speed limit is 40mph on NY Route 15A and 35mph on Crittenden Road.

NY Route 15A (East Henrietta Road) @ I-390:

At the I-390 exit 16 onto NY Route 15A (East Henrietta Road), there exists a northbound on/off ramp and a southbound on/off ramp. These two ramps are each controlled by an actuated coordinated signal that operates under one controller.

NY Route 15A (East Henrietta Road) @ Westfall Road:

The intersection is controlled by an actuated coordinated signal and consists of two travel lanes in each direction with exclusive left turn lanes on each approach. The posted speed limit is 30mph.

NY Route 15A (East Henrietta Road) @ South Avenue:

As documented by NYSDOT, South Avenue carried approximately 11,500 vehicles per day north of NY Route 15A in 2009. The T-intersection is controlled by an actuated

coordinated signal and consists of two travel lanes in each direction with an exclusive right turn lane on the northbound approach. The posted speed limit is 30mph.

East River Road @ Kendrick Road/Murlin Drive:

As documented by NYSDOT, East River Road carried approximately 4,400 vehicles per day west of Kendrick Road in 21200. Kendrick Road carried approximately 13,800 vehicles per day south of Elmwood Avenue in 2006. The intersection of East River Road/Kendrick Road is controlled by a semi-actuated uncoordinated signal. The roadway consists of two travel lanes in the eastbound and westbound directions with an exclusive left turn lane on the southbound approach. Murlin Drive currently is offset to the east using control by a stop sign on the northbound approach to the intersection. The posted speed limit is 30 mph.

East River Road @ I-390 SB Off-Ramp:

Exit 16A is an off-ramp from I-390 onto East River Road. The T-intersection is controlled by a semi-actuated uncoordinated signal with southbound exclusive right and left turn lanes. Two travel lanes in each direction exist on East River Road.

East River Road & Crittenden Road:

The unsignalized T-intersection is controlled with a stop sign on Crittenden Road. The intersection consists of one travel lane in each direction on both East River Road and Crittenden Road. The posted speed limit is 35 mph on each road.

Kendrick Road @ Lattimore Road:

The unsignalized intersection is offset with Lot 1 to the south of Lattimore Road. The intersection consists of one travel lane in each direction with exclusive left turn lanes on the westbound, northbound and southbound approaches. The posted speed limit is 30 mph.

Kendrick Road @ Crittenden Boulevard:

Kendrick Road is a north-south road that intersects at a four-way intersection with Crittenden Boulevard (westbound approach) and the University of Rochester's Lot #1 main driveway access (eastbound approach). This intersection is controlled by an actuated coordinated signal and consists of two travel lanes at the eastbound and westbound approaches. There are exclusive left turn lanes on the northbound and southbound approaches to the intersection. The posted speed limit is 30 mph.

Elmwood Avenue @ Kendrick Road:

As documented by the Monroe County Department of Transportation in 2006, Elmwood Avenue carries approximately 25,300 vehicles per day west of Kendrick Road and 22,000 east of Kendrick Road in 2006. As documented by Monroe County Department of Transportation in 2006, Kendrick Road carries approximately 13,800 vehicles per day south of Elmwood Avenue. The T-intersection is controlled by an actuated coordinated signal and consists of two travel lanes in each direction with an exclusive left turn lane on the westbound approach. The posted speed limit is 30 mph.

Elmwood Avenue @ South Avenue:

Elmwood Avenue is an east-west road that intersects at a five-legged intersection with South Avenue (northbound and southbound approaches) and Cook Street (one-way north-west bound, at the northwest corner of the intersection). As documented by the Monroe County Department of Transportation in 2006, Elmwood Avenue carries approximately 24,000 vehicles per day east of South Avenue. As documented by Monroe County Department of Transportation in 2006, South Avenue carries approximately 15,900 vehicles per day north of Elmwood Avenue. The five-legged intersection is controlled by an actuated coordinated signal and consists of two travel lanes in each direction with an exclusive left turn lane on the eastbound and westbound approaches. Cook Street is a one-lane north-west bound local road.

The jurisdiction designation for each of the roadways and intersections within the study area are summarized in **Table 1**.

Table 1: Jurisdiction Designation For Roadways & Intersections In Study Area

Roadway	Jurisdiction	Type
I-390	NYS	Interstate
I-590	NYS	Interstate
NY Route 15 (West Henrietta Road/Mt. Hope Avenue)	NYS	State Route
NY Route 15A (East Henrietta Road)	NYS	State Route
Elmwood Avenue	City of Rochester	Local Road
Kendrick Road	City of Rochester	Local Road
Crittenden Boulevard	City of Rochester	Local Road
South Avenue	City of Rochester	Local Road
Brighton-Henrietta Town Line Road	Monroe County	County Road
Crittenden Road	Monroe County	County Road
East River Road	Monroe County	County Road
Westmoreland Road	City of Rochester	Local Road
Westfall Road	City of Rochester	Local Road
Lattimore Road	City of Rochester	Local Road
Fort Hill Terrace	City of Rochester	Local Road
Southland Drive	Town of Brighton	Local Road
Doncaster Road	Town of Brighton	Local Road

Table 1: Jurisdiction Designation for Roadways & Intersections in Study Area (cont.)

Intersection	Jurisdiction
NY Route 15 (West Henrietta Road) & Brighton-Henrietta Town Line Road	NYS
NY Route 15 (West Henrietta Road) & Crittenden Road	NYS
NY Route 15 (West Henrietta Road) & Doncaster Road	NYS
NY Route 15 (West Henrietta Road) & Southland Drive	NYS
NY Route 15 (West Henrietta Road) & East River Road	NYS
NY Route 15 (West Henrietta Road) & I-390 NB On-Ramp	NYS
NY Route 15 (Mt. Hope Avenue) & Westmoreland Road/Westfall Road	Monroe County
NY Route 15 (Mt. Hope Avenue) & Lattimore Road	Monroe County
NY Route 15 (Mt. Hope Avenue) & Crittenden Blvd/NY Rte 15A/Fort Hill Terrace	Monroe County
NY Route 15 (Mt. Hope Avenue) & Elmwood Avenue	Monroe County
NY Route 15A (East Henrietta Road) & Crittenden Road	NYS
NY Route 15A (East Henrietta Road) & Stan Yale Drive	Monroe County
NY Route 15A (East Henrietta Road) & Westfall Road	Monroe County
NY Route 15A (East Henrietta Road) & South Avenue	Monroe County
East River Road & Kendrick Road/Murlin Drive	NYS
East River Road & I-390 SB Off-Ramp	NYS
Kendrick Road & Lattimore Road	Monroe County
Kendrick Road & Crittenden Boulevard	Monroe County
Elmwood Avenue & Kendrick Road	Monroe County
Elmwood Avenue & South Avenue	Monroe County

The average daily traffic volumes (ADT) for the major roadways studied are summarized below in

Table 2.

Table 2: Average Daily Traffic Volume Summary (ADT)

Roadway	ADT	Year Counted
-390 (NYS Route 390)		
Northbound (between exit 16 and 17)	35,576	2008
Southbound (between exit 16 and 17)	40,150	2008
I-590 (NYS Route 390)		
Northbound (between exit 1 and 2)	37,461	2008
Southbound (between exit 1 and 2)	37,655	2008
West Henrietta Rd./ Mt. Hope Ave. (NYS Route 15)		
South of NYS Rt. 390	33,009	2008
North of NYS Rt. 390	19,179	2007
East Henrietta Rd. (NYS Route 15A)		
South of NYS Rt. 390	27,105	2008
North of NYS Rt. 390	28,581	2006
Elmwood Avenue		
East of Kendrick Rd (East Dr. to Mt. Hope Ave)	22,089	2006
West of Kendrick Rd	25,318	2006
Kendrick Road		
South of Elmwood	13,798	2006
Crittenden Boulevard		
West of Mt. Hope Avenue	9,656	2006
East River Road		
West of NY Route 15	17,947	2012
West of Kendrick Road	4,416	2012
Lattimore Road		
West of NY Route 15	2,406	2004
South Avenue		
North of NY Route 15A	11,509	2009

*Traffic data derived from NYS Department of Transportation Traffic Volume Report, the NYSDOT Traffic Data Viewer and MCDOT Monroe County Traffic Summary 2012 spreadsheet report.

IV. EXISTING AND BACKGROUND (NO-BUILD) TRAFFIC VOLUMES

Study Area

The study area for the University of Rochester has been determined in coordination with the Town of Brighton, the Monroe County Department of Transportation, and the New York State Department of Transportation. The study area encompasses the University's South Campus, Medical Center Campus, and River Campus and the surrounding transportation network, as identified in **Figure 3**, which includes intersection locations where peak hour turning movement counts were conducted.

Existing (2008) Traffic Volumes

Traffic volume turning movement counts were conducted for all the studied intersections during the weekday peak hours of 7:00AM-9:00AM and 4:00PM-6:00PM. TYLI performed traffic counts on November 14-17, 2006 at the following intersections:

- Elmwood Avenue @ Kendrick Road
- Elmwood Avenue @ East Drive (conducted on February 1st, 2007, and March 10, 2010)
- Crittenden Blvd. @ East Drive (conducted on February 1st, 2007)
- Elmwood Avenue @ South Avenue
- E. Henrietta Road @ Westfall Road
- Kendrick Road @ Lattimore Road/Lot 1
- Kendrick Road @ Westmoreland Drive
- Kendrick Road @ E. River Road

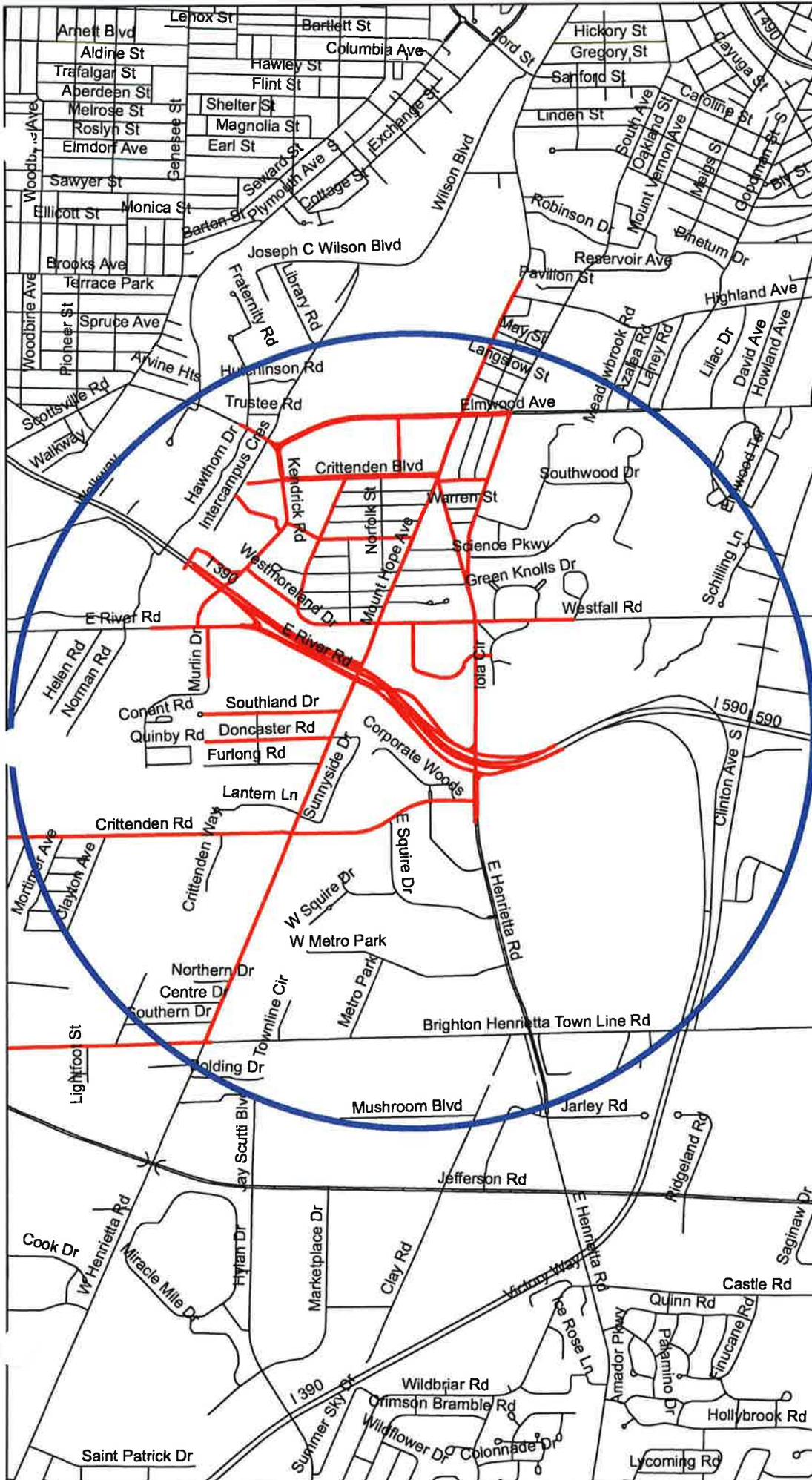
In addition, pedestrian and traffic volume counts were collected at the intersection of Elmwood Avenue and the School of Medicine and Dentistry Building Pedestrian Crossing on November 8, 2007 and December 12, 2007.

Traffic volume turning movement counts were obtained from Bergmann Associates from the Mt. Hope/E. Henrietta Study. The counts were performed by SRF & Associates in 2006 at the following intersections:

- Mt. Hope Avenue @ Elwood Avenue
- Mt. Hope Avenue @ Crittenden Blvd/E. Henrietta/Fort Hill Terrace
- Mt. Hope Avenue @ Lattimore Road
- Mt. Hope Avenue @ Westmoreland Drive/Westfall Road
- E. Henrietta Road @ South Avenue
- West Henrietta @ Southland Drive
- West Henrietta @ Doncaster Road
- West Henrietta @ Crittenden Road

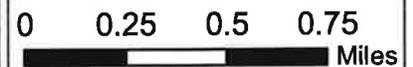
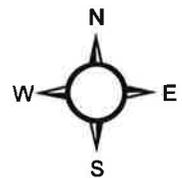
University of Rochester
City of Rochester
Planned Development

Figure 3:
Limits of
Study Area



Legend

- Project Location
- Limits of Study Area



- West Henrietta @ Brighton Henrietta Town Line Road
- East River Road @ Crittenden Road
- E. Henrietta Road @ Crittenden Road

Traffic volume turning movement counts were obtained from the New York State Department of Transportation conducted in March 2005 at the following I-390 ramp intersections:

- I-390 NB Off/On Ramps @ Rt. 15A
- I-390 SB Off/On Ramps @ Rt. 15A

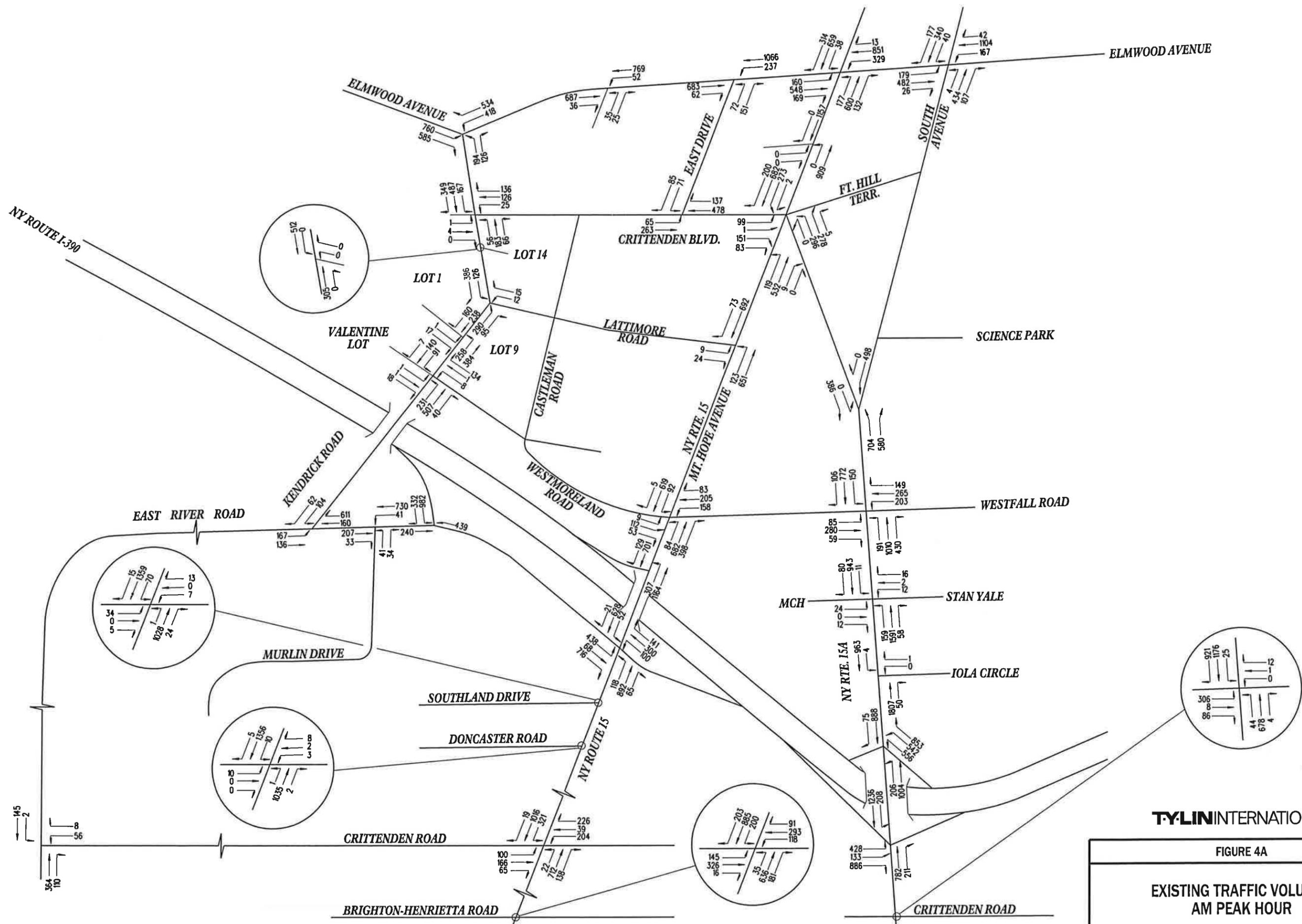
Traffic volume turning movement counts were also obtained from the University of Rochester South Campus IPD Rezoning Study dated September 2005, performed by TYLI at the following intersections:

- I-390 NB On Ramp @ Rt. 15
- I-390 SB Off Ramp @ East River Road
- East River Road @ Rt. 15
- Kendrick Road @ Crittenden Blvd./Lot 1

The existing traffic volumes for the weekday morning and weekday evening peak hours are shown in **Figures 4A** and **4B**. The traffic count summary sheets are located in **Appendix ‘G’**.

Due to the size of the overall study area and the expansion of the study area, a majority of the turning movement data used for the report was collected over a period of time. As identified in above, the turning movement data for each of the intersections located in the Town of Brighton was collected in 2006

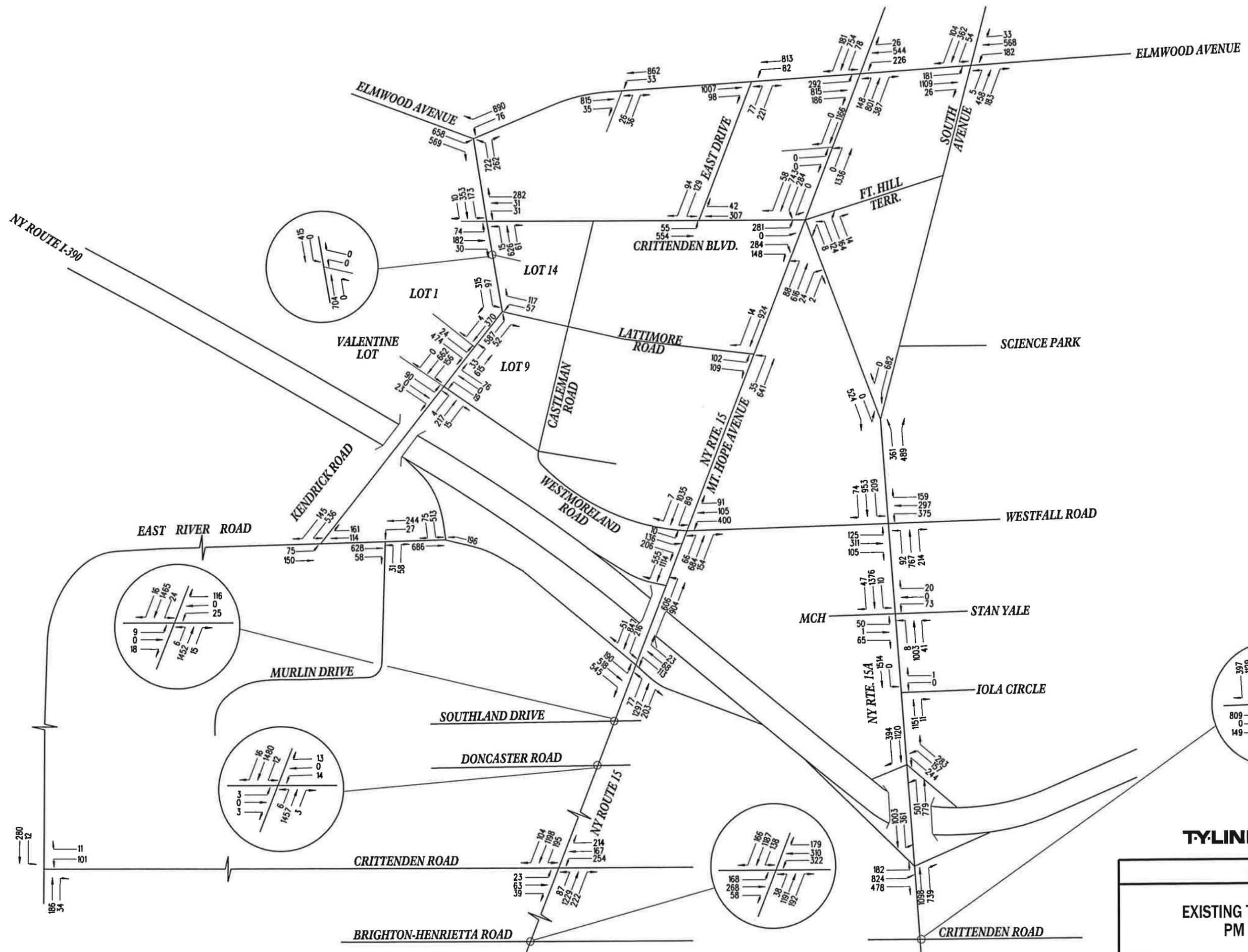
Despite recent reductions in the overall traffic volume trends in the Town of Brighton and the City of Rochester, all of the original traffic volume counts were grown by approximately 1% to 1.2% per year to normalize the counts to determine traffic volumes for the Existing Conditions. This is consistent with a memo distributed by Monroe County Department of Transportation (MCDOT) on April 2, 2013 regarding County wide traffic volume trends between 2001 and 2012. The study found that the Town of Brighton has experienced an annual 1.6% reduction in traffic volume during the time period studied. In general, MCDOT stated that this may be due to the “ongoing economic downturn, an aging population and continued gas prices.” In spite of the downward trends, MCDOT recommends annual growth rate of 1% for the Town of Brighton and the City of Rochester. A copy of the memo is located in **Appendix ‘G’**.



TYLIN INTERNATIONAL

FIGURE 4A

EXISTING TRAFFIC VOLUMES
AM PEAK HOUR



TYLIN INTERNATIONAL

FIGURE 4B

EXISTING TRAFFIC VOLUMES
PM PEAK HOUR

Background 5-year (no-build) Traffic Volumes

To account for normal background growth, a 1.0% growth rate per year was applied to the existing (2008) traffic volumes for five years to estimate background five-year (no build) traffic volumes. A 1.2% growth rate per year was applied to the section of East Henrietta Road between I-390 and South Ave. The growth factors were determined based on historical traffic volume data provided by the NYSDOT and the MCDOT memo regarding traffic volume trends.

The NYSDOT's I-390/Rt. 15/Rt. 15A project concept and preliminary designs evolved from the Southern Corridor Mobility Study, completed in 2001. Proposed improvements that will have an effect on the future traffic patterns within the study area include partial reconstruction of I-390 from the Genesee River to I-590, rehabilitation/reconstruction of numerous bridges, new frontage roads, and new access ramps for NY 15 and NY 15A. Scheduled for construction within the next five years is the reconstruction of the I-390/Rt. 15A Northbound Off/On Ramps. The NYS DOT's concept plan for the I-390 project is provided in **Appendix 'K'**. This alternative plan from the Southern Corridor Mobility Study is provided in **Appendix 'K'**. The NYSDOT plans to design and construct the following geometric improvements:

- Provide new one-lane ramp exit with a one-lane loop exit onto southbound East Henrietta Road. Traffic continuing would exit the Interstate system at a signalized intersection at West Henrietta Road at East River Road.
- Modify the traffic signal on East Henrietta Road at I-390 EB Ramp.
- Maintain existing ramp for use for traffic heading onto northbound East Henrietta Road.
- Construct a new one-lane on-ramp to I-390 EB from NB West Henrietta Road.
- Elimination of traffic signal on West Henrietta Road at the existing I-390 WB on-ramp.
- Provide a new EB on-ramp from East River Road onto I-390 adjacent to the existing EB off-ramp.
- Eliminate the southbound left-turn on West Henrietta Road at East River Road.
- Kendrick Road/I-390 interchange consisting of a northbound on-ramp to I-390 and bridge replacement over I-390.
- Relocate Murlin Drive west of the existing location to be the southern leg of the roundabout at Kendrick road and East River Road.

In addition to the ongoing NYSDOT improvement plans for I-390, the City of Rochester is designing roadway improvements on Mt. Hope Avenue between Elmwood Avenue and the City/Brighton Town Line. Concept plans of these improvements are provided in **Appendix ‘L’**. The Mt. Hope improvements generally include the following improvements:

- Addition of median on Mt Hope Avenue between Elmwood Avenue and Crittenden Boulevard,
- Two lanes in each direction,
- Addition of a 650 ft eastbound right-turn lane at the intersection of Elmwood and Mt. Hope Avenue.
- Addition of a northbound left turn land at the intersection of East Henrietta Road and Westfall Road.

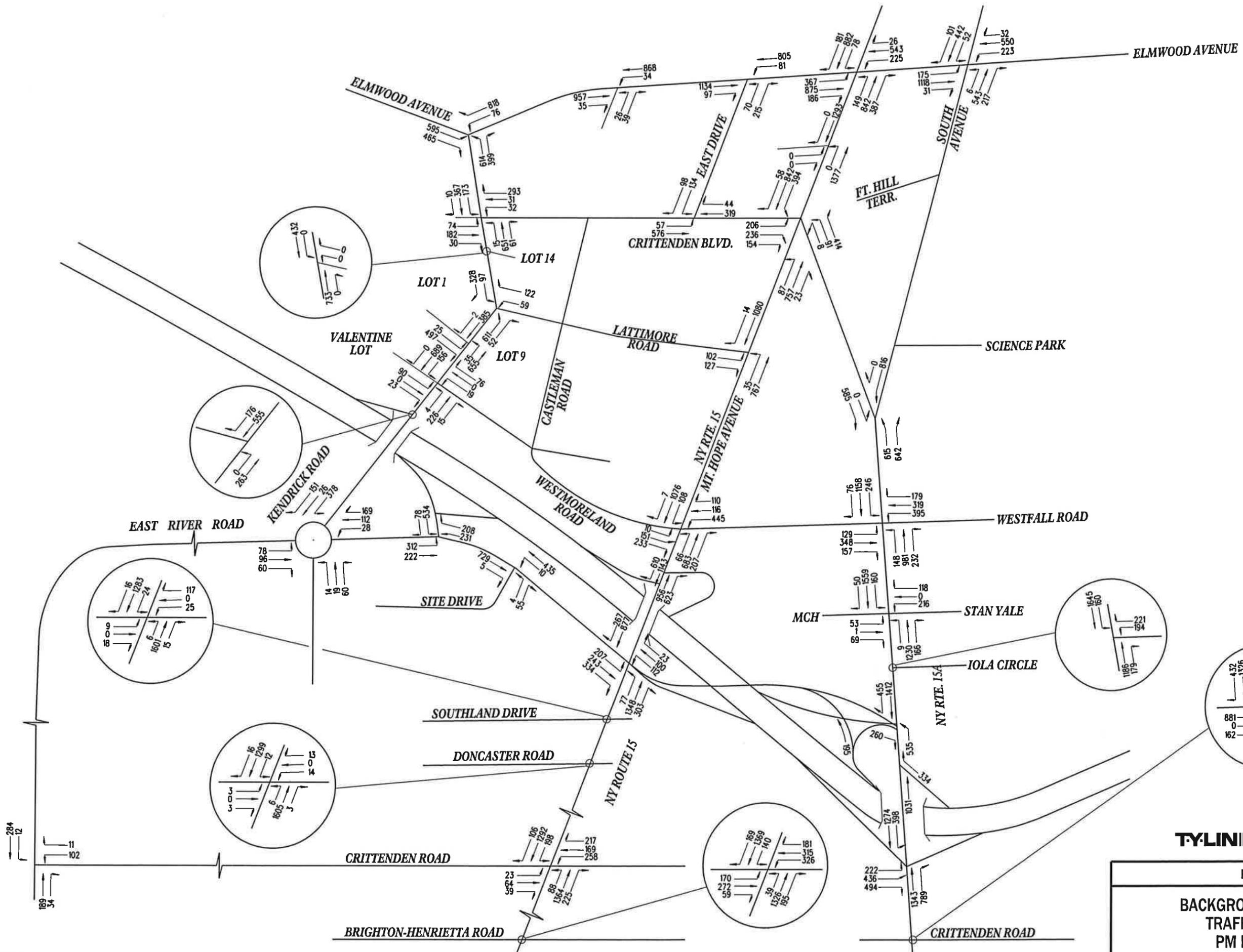
In addition to the geometric improvements outlined above, new traffic proposed by the City Gate development is included in the background analysis. Current plans for the development include construction of a 150,000 square foot Costco’s retail store. Approximately 343,000 square feet of retail development was included in the approved TIS for City Gate. Background 5-Year (no-build) traffic volumes are shown in **Figures 5A and 5B** for the weekday morning and evening peak hours, respectively.

Roadway/Highway Improvements Needed to Support the University of Rochester Master Plan

In addition to the NYSDOT and City of Rochester roadway improvements within the study area that were identified for construction in the 5-year analysis, the following improvements are anticipated to be constructed within the study area prior to the University’s 20-year Full Build Plan :

- Kendrick Road realignment and widening to a 5-lane section,

As identified in The University of Rochester’s Master Plan, Kendrick Road will become the gateway to the Mid Campus/Medical Center. The existing three-lane section is planned to be re-aligned and widened to a five-lane section. The background 20-year analysis incorporates geometrical improvements to Kendrick Road as outlined in the Master Plan.



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FIGURE 5B

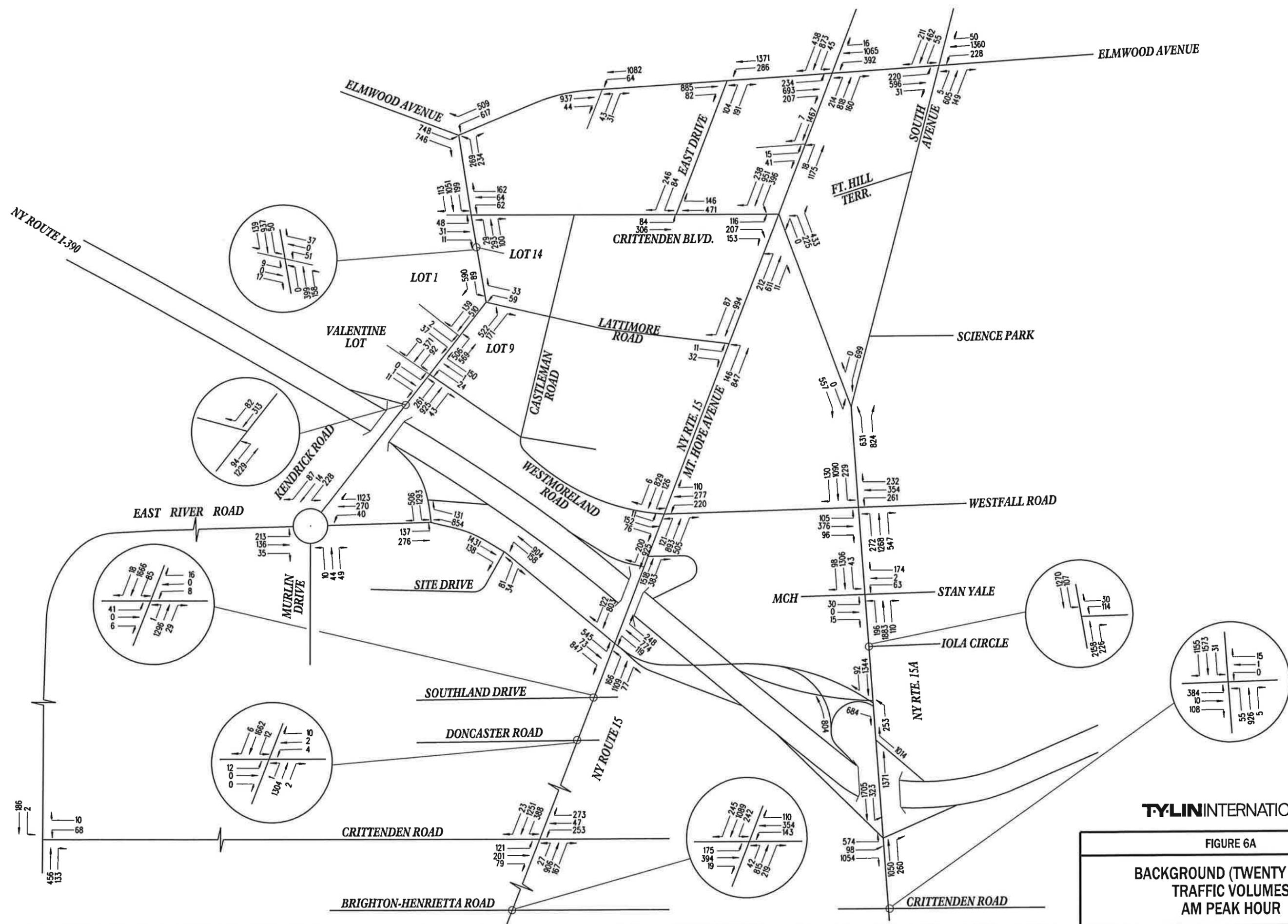
BACKGROUND (FIVE YEAR)
TRAFFIC VOLUMES
PM PEAK HOUR

The increased traffic associated with the University's growth is being accounted for in the NYS DOT's I-390 project planning and design. The NYS DOT I-390 on-ramp at Kendrick Road and I-390 is part of the project. The background (20-year) analysis explores the regional benefits that the Kendrick interchange will have on the local roadway network.

Background 20-year (no-build) Traffic Volumes

To account for normal background growth, a 1.0% average growth rate per year was applied to the existing (2008) traffic volumes for twenty years to estimate background 20-year (no-build) traffic volumes. And a growth rate of 1.2% per year was applied to the section of East Henrietta Road between I-390 and South Ave. The growth factor on East Henrietta Road is based on historical traffic volume data provided by the NYSDOT.

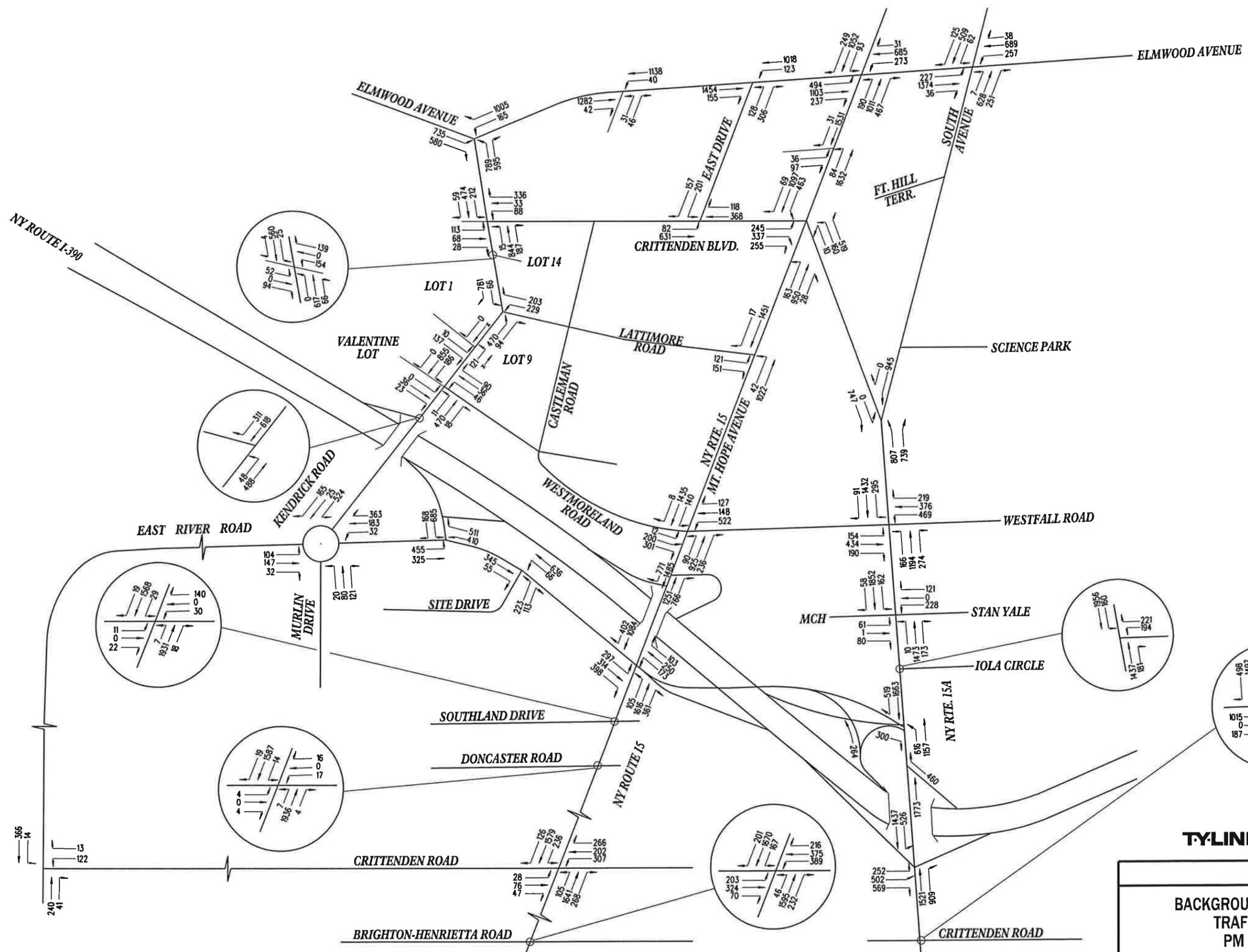
Background 20-year (no-build) traffic volumes are shown in **Figures 6A and 6B** for the weekday morning and evening peak hours, respectively.



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FIGURE 6A

BACKGROUND (TWENTY YEAR)
TRAFFIC VOLUMES
AM PEAK HOUR



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FIGURE 6B

**BACKGROUND (TWENTY YEAR)
TRAFFIC VOLUMES
PM PEAK HOUR**

V. TRIP GENERATION AND DISTRIBUTION

This report analyzes the University’s anticipated growth for both five-year and twenty-year development timeframes. The College Town development, Warner School and the first stages of the CTSB, the Prism buildings and approximately 130,000 sf of development in the South Campus are planned to be constructed within the first five years. Additional development uses including academic, research, clinical and medical uses are proposed for the full build 20-year projections.

To determine potential future trips for both stages of growth, the most commonly used source of trip generation information from the Institute of Transportation Engineers’ (ITE) Report Trip Generation, 8th Edition was used. Applicable land use codes were used to determine the most relevant trip generation rates from the ITE Trip Generation Report. The land use codes are further explained in this section.

College Town (0-5+)

College Town is a mixed-use development proposed on the University of Rochester Medical Center campus that has been conceptualized to help integrate the Medical Center campus with the surrounding neighborhood more seamlessly. The creation of the College Town will create an urban sense of place with a mix of residential, ground floor retail uses, open space, and office space with the following breakdown of uses:

- 240,000 gross square feet of residential space (apartments)
- 80,000 gross square feet of ground floor retail space
- 150,000 gross square feet of office/administrative space (primarily medical-related uses)
- Two 1,000-space parking garages, one located off Elmwood Avenue and one located closer to Mt. Hope Avenue.
- A new signalized site access road is proposed to serve the College Town Area, off Mt. Hope Avenue midway between Elmwood Avenue and Crittenden Boulevard, which would connect through to East Drive.

Because College Town is comprised of different land use types, different land use codes were applied to the development to determine the future trips generated by the development. The

following ITE Land Use Codes were used to determine trips for College Town: “Shopping Center” - LUC 820, “Residential Apartments”- LUC 220 and “General Office Building”- LUC 710.

Five Year Build

The peak hour vehicle trip projections for the anticipated development are summarized in **Table 2a** for the 5-year build analysis. Future trips for the South Campus were calculated based on gross square footage using Land Use Code – 720 “Medical Office Buildings”. Future trips for CTSB and Prism were calculated using Land Use Code – 610 “Hospital” and were based on the proposed number of employees. Future trips for the proposed Warner School were calculated using Land Use Code – 550 “University/College” and were also based on the number of employees. The varying employee densities were based on employment density rates now in use at the University of Rochester Medical Center campus³. A copy of the Master Plan Parking Forecast document is included in **Appendix ‘J.’** Detailed trip generation calculations and summary sheets for the 5-year build year scenario are presented in **Appendix ‘B.’**

To provide a conservative estimate of new trips on the highway system, no “pass-by trips”, are identified.

Table 2a: Trip Generation Summary – 5-year Build

<u>Land Use</u>	<u>Number of Employees</u>	<u>Size (GSF)</u>	<u>AM Peak Hour</u>			<u>PM Peak Hour</u>		
			<u>Enter</u>	<u>Exit</u>	<u>Total</u>	<u>Enter</u>	<u>Exit</u>	<u>Total</u>
Warner School	86	70,000	0	0	0	22	54	76
CTSB	761	385,000	181	78	259	90	161	251
Prism	1663	504,000	369	169	538	198	351	549
South Campus	N/A	130,000	246	65	311	103	266	369
College Town	N/A	470,000	54	109	163	183	160	343
Total			850	421	1,271	596	992	1,588

³ Martin Alexiou Bryson, University of Rochester - Transportation Support for the Master Plan Parking Forecasts, March 7, 2008.

20-year Full Build (20-year)

The peak hour vehicle trip projections for the anticipated development are summarized in **Table 2b** for the 20-year full build scenario. Future trips for the residential portion of the South Campus were calculated based on Land Use Code – 220 “Apartment Units. The balance of the development in South Campus and the Future Mid-Campus trips were calculated using Land Use Code – 550 “University/College” and were based on the number of employees per square foot of development. The varying employee densities were based on employment density rates now in use at the University of Rochester Medical Center campus⁴. Detailed trip generation calculations and summary sheets for the 20-year build-out are presented in **Appendix ‘B.’**

The 20-year development proposes up to 471 new residential units on the Mid-Campus; however, it is expected that there will be no new net vehicle trips generated from residential traffic due to the following factors:

1. The proposed residential units serve “on-site” students.
2. An extensive pedestrian circulation system (internal and external) with sidewalk, trails and internal building connections linking the proposed campus expansion with the existing Medical Center and the River Campus campuses,
3. A proposed circulator shuttle bus system, and
4. A central pedestrian trail and bus route via the abandoned rail line linking the South Campus, Mid-Campus and River Campuses.

The 20-year development proposes up to 400 new residential units on the South Campus. Based on the projected Mid Campus parking ratios and the University’s plan to lease the residential units to only those involved with the University, a 10 percent reduction was applied to the new residential trips. The reduction is based on the presumption that at least 10 percent of the residents will utilize campus shuttle buses to access the Mid-Campus.

⁴ Ibid

Table 2b: Trip Generation Summary – 20-year Full Build

<u>Land Use</u>	<u>Number of Employees</u>	<u>Size (GSF)</u>	<u>AM Peak Hour</u>			<u>PM Peak Hour</u>		
			<u>Enter</u>	<u>Exit</u>	<u>Total</u>	<u>Enter</u>	<u>Exit</u>	<u>Total</u>
Academic	1,251	1,018,580	291	64	355	96	234	330
Research	2,788	1,410,080	649	142	791	213	522	735
Clinical	2,340	708,940	544	120	664	179	438	617
CTSB	1,014	512,910	235	52	287	77	190	267
New Medical	3,303	1,300,000	769	168	937	253	618	871
Sub Total Med-Center	10,696	5,986,05	2,488	546	3,034	818	2,002	2,820
Research/ Office/Clinical	N/A	1.29 M	626	187	813	194	580	774
Residential	400 Units (90%)	476,400	36	144	180	140	75	215
Sub Total South Campus			662	331	1,013	334	655	989
*College Town	N/A	470,000	54	109	163	183	160	343
Total			3,204	989	4,190	1,335	2,817	4,152

* Refer to Table 3 for College Town trip generation summary

Some of the trips are associated with existing uses that are planned for relocation to new space. Those volumes already on the network have been redistributed through the network in the background analysis. Some of the existing uses in College Town are planned for relocation off-site (off the network) and some are planned to be backfilled with existing tenants relocated from other parts of the campus. For the purpose of this study, College Town trips were generated for the full build out of 470,000 GSF for both the 5-year and 20-year analysis. To account for relocated trips, a credit was calculated based on the land use code associated with the existing tenant's use. **Table 3** identifies the trip generation calculation for the College Town Development. More detailed information on the calculation of the College Town Credit is presented in **Appendix 'B'**.

Table 3: Trip Generation Summary – College Town Development

<u>Land Use</u>	<u>LUC</u>	<u>Size</u> <u>(GSF or</u> <u>Unit #'s)</u>	<u>AM Peak Hour</u>			<u>PM Peak Hour</u>		
			<u>Enter</u>	<u>Exit</u>	<u>Total</u>	<u>Enter</u>	<u>Exit</u>	<u>Total</u>
Retail	820	80,000	50	32	82	144	156	300
Residential	220	240 (units)	24	98	122	97	52	149
Office/Admin	710	150,000	<u>205</u>	<u>28</u>	<u>233</u>	<u>38</u>	<u>186</u>	<u>244</u>
Sub-Total			279	158	437	279	394	673
College Town Credit			<u>225</u>	<u>49</u>	<u>274</u>	<u>96</u>	<u>234</u>	<u>330</u>
Total			54	109	163	183	160	343

Trip distribution calculations for both the 5-year analysis and the 20-year analysis were based on existing traffic patterns, a review of regional population patterns and University of Rochester employee zip code information. The projected traffic for the proposed new development was distributed to the adjacent roadway system by taking into consideration the existing traffic patterns and logical routing patterns from surrounding residential communities. Although modifications to and around Kendrick Road are anticipated for the 20-year build analysis, the overall directional distribution leading to the study area is anticipated to remain the same.

The following represents the site trips distributed to the study area from the major roads leading into the study area: 10% from the west via Elmwood Avenue, 8% from the east via Elmwood, 10% from the north on Mt. Hope and 5% from the south via West Henrietta Road, 3% from the west via East River Road, 4% from the east via Westfall road, 43% from the east via I390 and 17% from the west via I390.

Figures 9A-1 through 9B-2 identify the directional trip distribution percentages for College Town and **Figures 11A-1 through 11B-2** identify the directional trip distribution percentages for the Mid-Campus and South Campus for the 5-year analysis. The estimated new vehicle trips traveling to/from College Town are provided in **Figures 10A-1, 10-A-2, 10-B-1 and 10-B-2** for the 5-year build weekday morning and weekday evening peak hours. **Figures 12A-1, 12-A-2,**

12-B-1 and 12-B-2 identify the estimated new vehicle trips traveling to/from Mid-Campus and South Campus for the 5-year build weekday morning and weekday evening peak hours. The figures are located in **Appendix ‘H’**.

Figures 13A and 13B identify the directional trip distribution percentages for College Town and **Figures 15A and 15B** identify the directional trip distribution percentages for the Mid-Campus and South Campus for the 20-year analysis. The estimated new vehicle trips traveling to/from College Town for the 20-year build analysis (for both weekday morning and weekday evening peak hours) are provided in **Figures 14A-1, 14A-2, 14B-1, and 14B-2**. **Figures 16A-1, 16A-2, 16-B-1 and 16-B-2** identify the estimated new vehicle trips traveling to/from Mid-Campus and South Campus for the 20-year build analysis for the weekday morning and weekday evening peak hours. The figures are located in **Appendix ‘H’**.

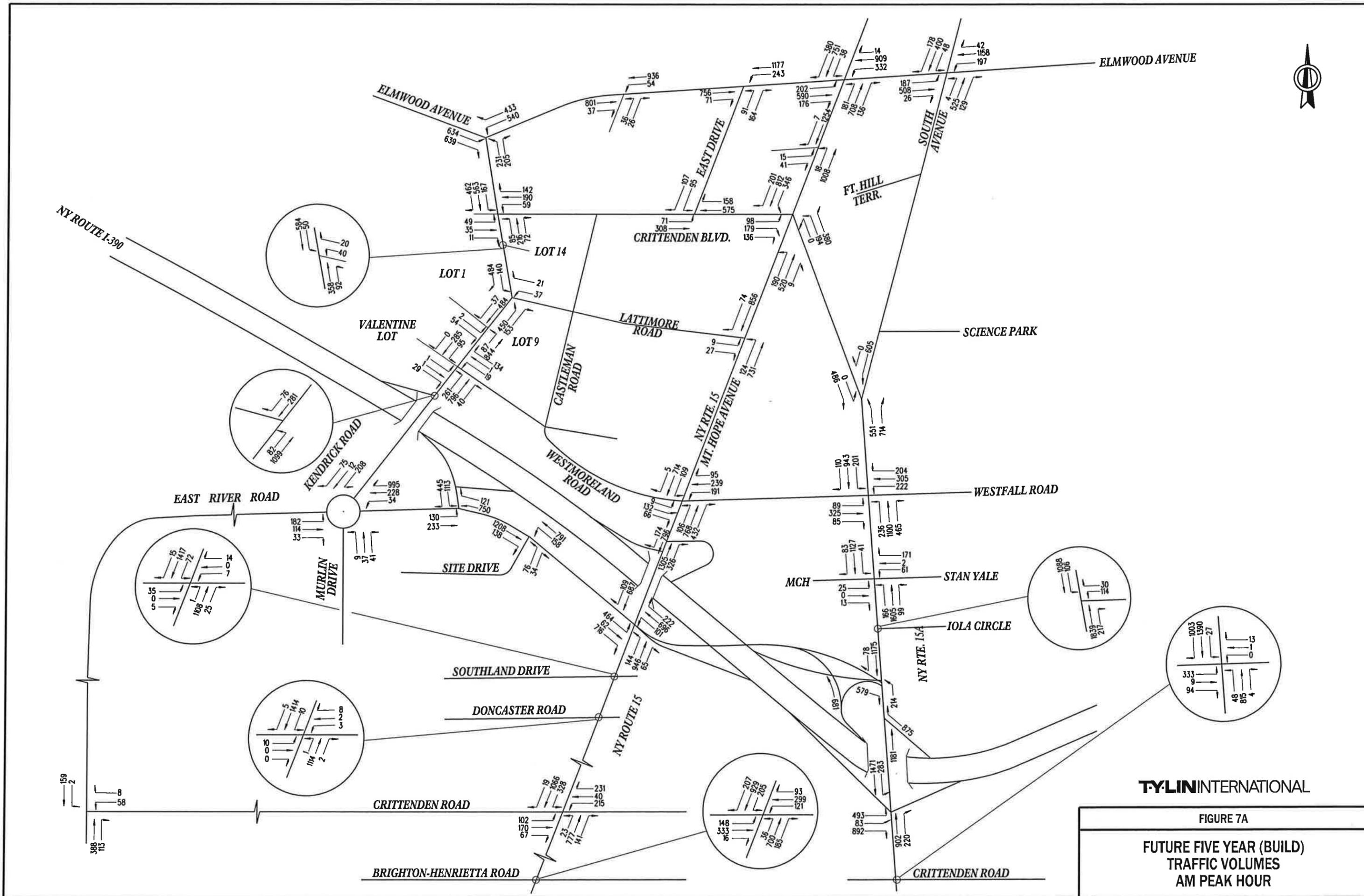
VI. FUTURE TRAFFIC VOLUMES

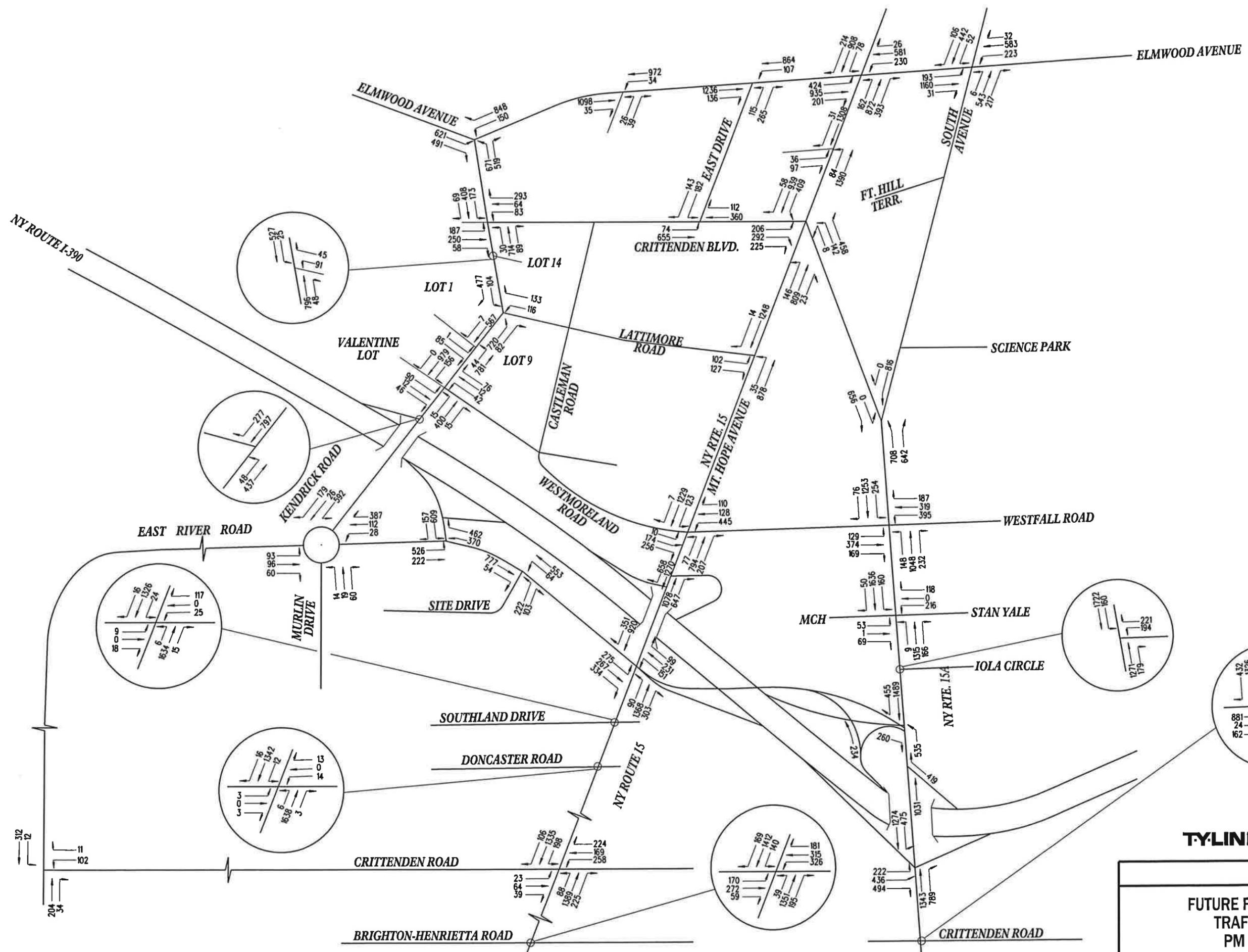
Future 5-year (build) Traffic Volumes

To estimate Future 5-year (build) traffic volume conditions, anticipated new trips for the projected five year development planned for the University of Rochester Mid-Campus, South Campus and College Town were added to the background 5-year (no-build) traffic volumes. The Future 5-year (build) traffic volumes are shown in **Figures 7A and 7B**.

Future 20-year (build) Traffic Volumes

To develop the Future 20-year (build) traffic volume conditions and to project impacts to the surrounding roadway network from the anticipated 20-year Mid-Campus growth as outlined for University of Rochester (Mid-Campus and College Town) Master Plan, new trips were added to the background 20-year (no-build) traffic volumes. Remote parking at Logan’s on Scottsville Road (west of the University) for 650 cars and additional parking off campus (2000 spaces) are factored into the future scenario. The Future 20-year (build) traffic volumes are shown in **Figure 8A and 8B**.

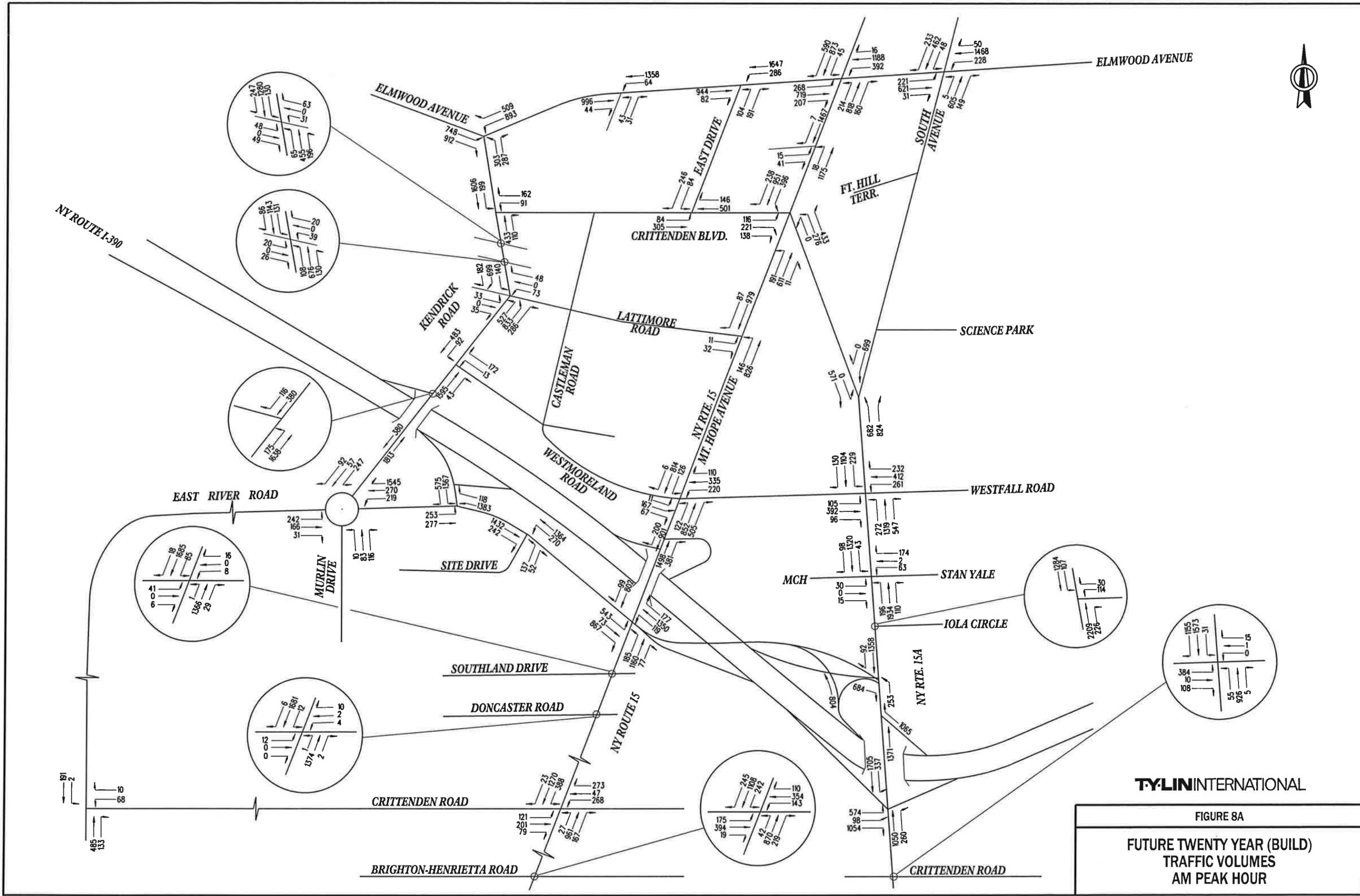




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FIGURE 7B

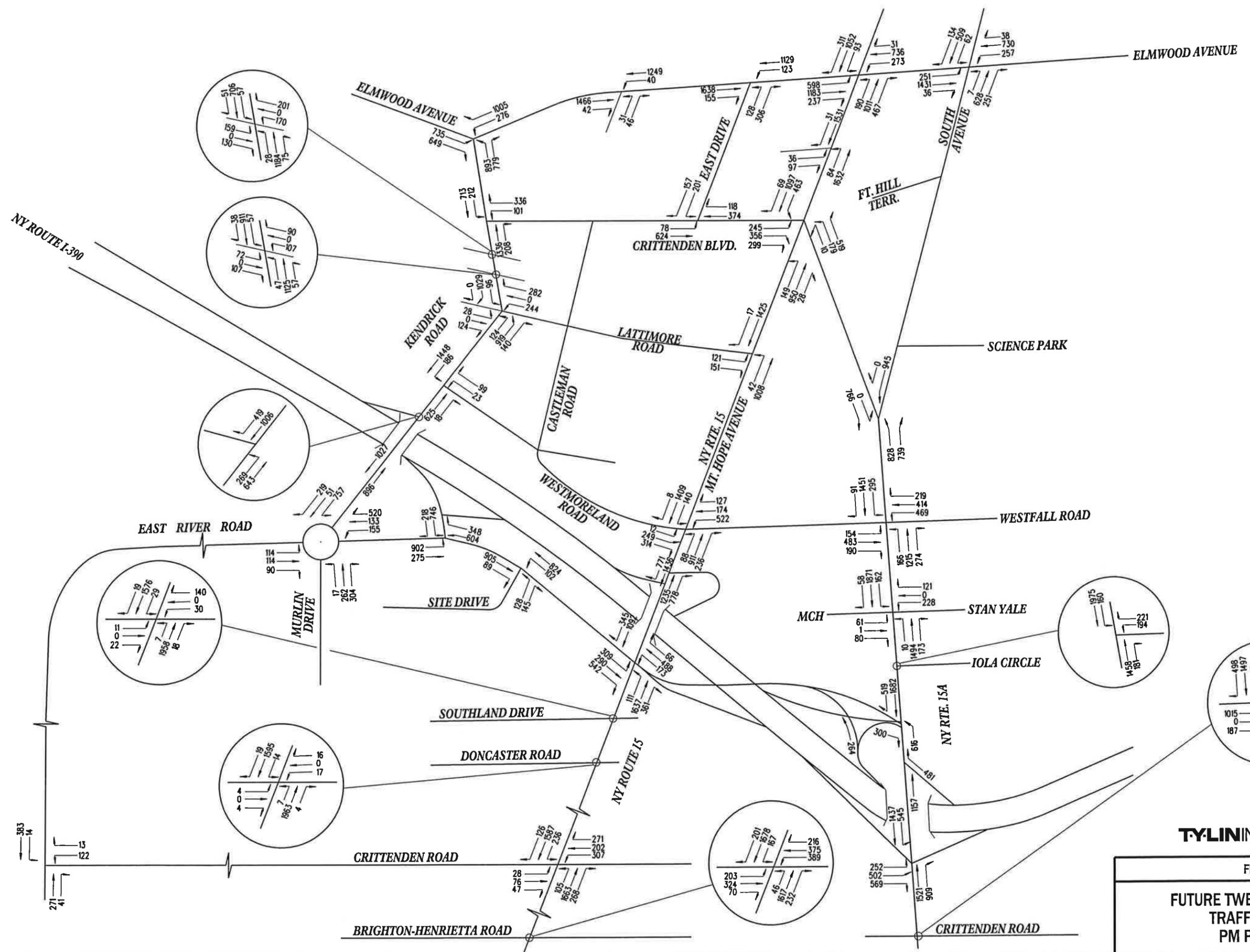
**FUTURE FIVE YEAR (BUILD)
TRAFFIC VOLUMES
PM PEAK HOUR**



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FIGURE 8A

FUTURE TWENTY YEAR (BUILD)
TRAFFIC VOLUMES
AM PEAK HOUR



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FIGURE 8B

FUTURE TWENTY YEAR (BUILD)
TRAFFIC VOLUMES
PM PEAK HOUR

VII. TRAFFIC OPERATIONS ANALYSIS

The Level of Service (LOS) analysis methodology for analyzing signalized and unsignalized intersections is documented in the Highway Capacity Manual (Transportation Research Board, Washington, D.C., 2000). The traffic-software Synchro 7 build 759 was used to analyze the studied intersections. Levels range from ‘A’ to ‘F’, with ‘A’ describing traffic operations with little or no delay, and ‘F’ describing traffic operations with long delays. Levels of Service for signalized and unsignalized intersections are expressed in terms of average control delay per vehicle. Full definitions of LOS for signalized and unsignalized intersections are included in **Appendix ‘C’**.

Table 4a presents a summary of the weekday morning and weekday evening peak hours for the intersection capacity analysis results for the Existing 2008, Background 5-year (no-build), and Future 5-year (build) traffic conditions. Each intersection has been identified by intersection name and intersection node number (as coded into the Synchro software program). The impacts of the proposed project at the studied intersections were assessed by comparing the Levels of Service (LOS) for background traffic with those for future traffic. Transportation improvements were considered where any Level of Service reductions were noted as a result of adding the site-generated traffic. The Synchro Level of Service analyses are provided in **Appendix ‘D’**.

Table 4a: Level of Service Summary - 5-year Build

Intersection Approach (Node #)	AM				PM			Build (5-Year) w/ Mit.
	Existing (2008)	Background (5-Year)	Build (5-Year)	Build (5-Year) w/ Mit.	Existing (2008)	Background (5-Year)	Build (5-Year)	
East River Road & Kendrick Road (1)								
EB LT T	A (5)	-	-	-	B (10)	-	-	-
WB T TR	A (2)	-	-	-	A (5)	-	-	-
SB L LR	A (9)	-	-	-	A (8)	-	-	-
Overall	A (3)	Roundabout)	Roundabout)	-	A (8)	Roundabout)	Roundabout)	-
East River Road & I-390 Off/On Ramp (2)								
EB L	-	B (19)	E (77)	-	-	C (21)	D (52)	-
EB LT T	B (15)	-	-	-	A (9)	-	-	-
EB T T	-	B (13)	B (12)	-	-	A (7)	A (8)	-
WB T T	B (16)	-	-	-	A (7)	-	-	-
WB T TR	-	B (15)	B (15)	-	-	A (8)	A (7)	-
SB L L	A (8)	B (12)	C (26)	-	A (10)	B (19)	D (40)	-
SB R	A (5)	A (7)	A (1)	-	A (3)	A (7)	A (8)	-
Overall	B (10)	B (11)	B (20)	-	A (9)	B (14)	C (21)	-
College Town Drive & Mt. Hope Avenue (3)								
EB L	-	-	D (54)	-	-	-	D (53)	-
EB R	-	-	C (22)	-	-	-	C (23)	-
NB L	-	-	A (1)	-	-	-	B (11)	-
NB T T	-	-	A (1)	-	-	-	A (9)	-
SB T TR	-	-	A (1)	-	-	-	A (1)	-
Overall	-	-	A (2)	-	-	-	A (7)	-
I-390 NB On-Ramp & West Henrietta Road (5)								
NB L	A (10)	-	-	-	D (40)	-	-	-
NB T T	A (1)	-	-	-	A (1)	-	-	-
NB T T T	-	Signal	Signal	-	-	Signal	Signal	-
SB T TR	A (9)	Removed	Removed	-	E (59)	Removed	Removed	-
SB T T	-	-	-	-	-	-	-	-
SB R	-	-	-	-	-	-	-	-
Overall	A (5)	-	-	-	D (39)	-	-	-
East River Road & West Henrietta Road (6)								
EB L	D (45)	D (52)	D (54)	D (53)	E (58)	E (57)	E (56)	D (54)
EB L L	-	-	-	-	-	-	-	-
EB LT TR	C (23)	B (17)	B (18)	B (18)	F (299)	D (47)	D (51)	D (43)
EB T	-	-	-	-	-	-	-	-
EB LT T	-	-	-	-	-	-	-	-
EB R	B (20)	B (10)	A (10)	A (7)	C (36)	A (9)	B (17)	B (13)
WB L	D (44)	D (48)	D (38)	C (33)	D (46)	E (61)	E (64)	D (54)
WB T TR	D (47)	D (50)	F (161)	E (63)	C (30)	D (43)	D (50)	D (43)
WB T T TR	-	-	-	-	-	-	-	-
NB L	D (42)	C (24)	C (33)	E (63)	C (34)	B (14)	C (26)	C (25)
NB T T	-	-	-	-	-	-	-	-
TR	C (32)	-	-	-	E (58)	B (15)	-	-
NB T T T	-	C (21)	C (23)	C (32)	-	-	C (21)	C (21)
NB R	-	A (7)	A (7)	A (6)	-	-	A (6)	A (7)
SB L	B (12)	-	-	-	F (127)	-	-	-
SB T TR	A (4)	C (21)	D (40)	D (47)	A (5)	C (25)	B (19)	C (26)
SB T T	-	-	-	-	-	-	-	-
SB R	-	-	-	-	-	-	-	-
Overall	C (28)	C (27)	E (57)	D (40)	F (91)	C (25)	C (28)	C (28)

Table 4a: Level of Service Summary - 5-year Build

Intersection Approach (Node #)	AM				PM			Build (5-Year) w/ Mit.
	Existing (2008)	Background (5-Year)	Build (5-Year)	Build (5-Year) w/ Mit.	Existing (2008)	Background (5-Year)	Build (5-Year)	
I-390 NB On/Off Ramp & East Henrietta Road (7) & (222)								
EB R	-	E (79)	D (49)	D (49)	-	B (18)	D (45)	-
WB L	F (81)	-	-	-	E (65)	-	-	-
WB LT TR	E (70)	-	-	-	D (48)	-	-	-
WB R	D (54)	-	-	-	B (10)	-	-	-
WB RR	-	D (40)	D (39)	D (39)	-	B (19)	D (53)	-
NB L	B (15)	-	-	-	D (44)	-	E (58)	-
NB L L	-	C (27)	C (24)	C (24)	-	C (25)	-	-
NB T T	A (4)	C (21)	A (9)	A (9)	A (1)	A (1)	A (7)	-
SB T T T	F (81)	-	-	-	C (24)	C (33)	-	-
SB T T	-	C (27)	C (21)	C (21)	-	-	B (10)	-
SB R	A (1)	A (1)	A (1)	A (1)	A (1)	A (1)	A (1)	-
Overall	D (52)	C (35)	D (25)	C (25)	C (23)	C (26)	C (21)	-
I-390 SB Ramp & East Henrietta Road (8)								
EB L	D (53)	D (40)	D (37)	D (37)	D (37)	D (346)	D (44)	D (45)
EB LT TR	D (50)	D (35)	C (34)	C (34)	F (128)	E (60)	E (72)	E (73)
EB R	F (258)	D (54)	E (57)	E (57)	D (49)	D (48)	D (50)	D (51)
NB T T T	D (52)	-	-	-	D (37)	-	-	-
NB T T	-	E (56)	C (33)	D (40)	-	D (37)	C (27)	C (27)
NB R	B (11)	A (1)	A (1)	A (1)	A (1)	A (1)	A (1)	A (1)
SB L	A (8)	-	-	-	C (29)	-	-	-
SB L L	-	C (21)	C (23)	C (23)	-	C (29)	D (35)	D (35)
SB T T	A (7)	C (25)	B (19)	B (17)	A (3)	A (3)	A (9)	A (9)
Overall	E (56)	D (36)	C (29)	C (30)	D (42)	C (26)	C (27)	C (27)
Westfall Road & East Henrietta Road (10)								
EB L	D (46)	C (31)	C (21)	B (19)	D (38)	C (22)	C (29)	C (31)
EB T TR	D (46)	D (57)	C (31)	C (25)	D (53)	D (42)	D (43)	D (51)
WB L	F (81)	-	-	-	E (67)	F (119)	-	-
WB LL	-	C (29)	E (69)	E (69)	-	-	F (101)	E (74)
WB T TR	D (42)	C (38)	C (28)	C (28)	D (42)	D (39)	D (38)	D (44)
NB L	C (21)	D (54)	E (57)	E (57)	C (35)	D (54)	C (33)	C (29)
NB T TR	C (30)	-	-	-	C (28)	-	-	-
NB T T	-	D (39)	E (56)	E (57)	-	D (41)	E (66)	E (66)
NB R	-	C (21)	B (14)	B (14)	-	A (4)	C (21)	C (26)
SB L	F (87)	C (32)	C (33)	C (33)	F (88)	F (127)	F (100)	E (72)
SB T TR	C (26)	C (31)	D (40)	D (40)	C (26)	F (101)	E (60)	E (60)
Overall	D (37)	C (33)	D (41)	D (41)	D (40)	E (68)	E (60)	D (57)
East Henrietta Road & South Ave (11)								
SB L L	D (50)	D (49)	D (52)	-	D (36)	C (31)	C (34)	-
SE T T	A (7)	A (9)	A (6)	-	B (17)	C (24)	B (18)	-
NW T	A (9)	A (3)	A (6)	-	A (9)	A (7)	B (18)	-
NW R	A (1)	B (14)	A (5)	-	A (5)	A (8)	A (2)	-
Overall	B (16)	B (20)	B (17)	-	B (19)	B (18)	B (18)	-
Crittenden Boulevard & Mt. Hope Avenue (12)								
EB L	D (42)	D (41)	D (43)	-	D (47)	D (43)	D (39)	-
EB LTR	D (49)	-	-	-	D (51)	-	-	-
EB R	D (48)	D (49)	D (54)	-	D (49)	D (50)	D (52)	-
EB R2	-	D (44)	D (50)	-	-	D (47)	D (46)	-
NB L	C (22)	B (20)	C (35)	-	B (18)	B (19)	D (42)	-
NB T TR	D (35)	D (37)	D (41)	-	B (18)	D (39)	D (46)	-
SB L	C (34)	C (33)	C (34)	-	C (21)	D (36)	D (54)	-
SB T TR	D (48)	D (43)	D (40)	-	C (27)	C (24)	C (22)	-
NW L	D (52)	D (47)	D (53)	-	F (113)	E (73)	E (75)	-
NW R	E (58)	A (10)	B (10)	-	E (56)	C (23)	C (21)	-
Overall	D (44)	D (37)	D (38)	-	D (36)	D (35)	D (38)	-

Table 4a: Level of Service Summary - 5-year Build

Intersection Approach (Node #)	AM				PM			
	Existing (2008)	Background (5-Year)	Build (5-Year)	Build (5-Year) w/ Mit.	Existing (2008)	Background (5-Year)	Build (5-Year)	Build (5-Year) w/ Mit.
Elmwood Avenue & Mt. Hope Avenue (13)								
EB L	D (41)	D (49)	E (75)	E (75)	E (60)	F (109)	E (74)	E (74)
EB T TR	D (51)	D (52)	-	-	E (66)	F (84)	-	-
EB T T	-	-	C (32)	C (32)	-	-	D (38)	C (38)
EB R	-	-	B (10)	B (10)	-	-	A (10)	A (10)
WB L	E (57)	E (58)	E (74)	E (74)	F (80)	E (79)	E (57)	E (57)
WB T TR	D (38)	D (38)	C (23)	C (23)	B (15)	B (15)	D (44)	D (44)
NB L	E (66)	E (66)	E (77)	E (77)	C (32)	C (25)	E (68)	E (68)
NB T TR	C (26)	C (22)	B (20)	B (20)	D (48)	D (51)	E (68)	E (68)
SB L	B (17)	B (18)	B (16)	B (16)	C (28)	C (28)	C (27)	C (27)
SB T TR	D (39)	D (50)	D (42)	D (42)	D (42)	D (54)	E (70)	E (70)
Overall	D (41)	D (43)	D (36)	D (36)	D (48)	E (59)	E (57)	E (57)
Lattimore Road & Mt. Hope (14)								
EB LR	C (26)	C (25)	C (26)	-	D (43)	D (45)	D (42)	-
NB LT T	A (2)	A (2)	A (6)	-	A (9)	A (7)	A (6)	-
SB T TR	A (1)	A (1)	A (1)	-	A (1)	A (1)	B (14)	-
Overall	A (2)	A (2)	A (4)	-	A (9)	A (8)	B (14)	-
Westfall Road & Mt. Hope Avenue (15)								
EB LT	D (47)	D (46)	D (50)	-	D (52)	D (50)	D (49)	D (49)
EB R	B (12)	B (13)	B (16)	-	B (18)	B (20)	C (25)	C (24)
WB L	C (29)	C (30)	C (29)	-	F (116)	F (171)	E (61)	D (52)
WB TR	C (29)	C (29)	C (30)	-	B (13)	D (40)	B (18)	B (17)
NB L	B (10)	B (12)	C (22)	-	F (83)	E (57)	B (19)	B (17)
NB T T	B (13)	B (13)	C (26)	-	D (41)	C (35)	B (13)	B (17)
NB R	A (3)	A (2)	A (5)	-	B (19)	B (14)	A (2)	A (3)
SB L	C (35)	D (35)	D (37)	-	E (61)	E (67)	C (24)	C (25)
SB T TR	C (36)	D (36)	C (28)	-	B (14)	B (17)	D (42)	D (51)
Overall	C (22)	C (22)	C (25)	-	D (39)	D (48)	C (32)	C (34)
East Henrietta Road & Iola (18)								
WB	F (61)	F (>99)	-	-	C (33)	F (>99)	-	-
SB	A (1)	D (33)	-	-	A (1)	B (13)	-	-
WB L	-	-	E (63)	-	-	-	E (59)	-
WB R	-	-	B (16)	-	-	-	B (11)	-
NB T T	-	-	B (12)	-	-	-	A (8)	-
NB R	-	-	A (1)	-	-	-	A (1)	-
SB L	-	-	D (49)	-	-	-	C (23)	-
SB T T	-	-	A (2)	-	-	-	B (14)	-
Overall	unsignalized	unsignalized	B (11)	-	unsignalized	unsignalized	B (14)	-
Crittenden Boulevard & Kendrick Road (21)								
EB L	D (37)	D (37)	D (54)	-	D (43)	D (43)	E (76)	D (50)
EB TR	D (34)	C (34)	C (30)	-	D (50)	D (50)	D (46)	D (39)
WB LT	D (50)	D (50)	E (64)	-	D (45)	D (45)	F (96)	D (54)
WB L	A (10)	A (10)	A (9)	-	B (14)	B (13)	A (7)	A (6)
NB L	A (4)	A (5)	A (6)	-	A (6)	A (6)	A (7)	A (10)
NB T	A (10)	B (10)	B (12)	-	C (23)	C (24)	D (37)	D (43)
NB R	A (3)	A (3)	A (3)	-	A (8)	A (9)	A (9)	B (12)
NB T TR	-	-	-	-	-	-	-	-
SB L	A (3)	A (3)	A (6)	-	A (9)	B (14)	D (35)	D (42)
SB T	A (8)	A (8)	B (15)	-	A (5)	A (5)	A (7)	A (8)
SB T T	-	-	-	-	-	-	-	-
SB R	A (7)	A (7)	B (15)	-	A (4)	A (4)	A (6)	A (6)
Overall	B (11)	B (11)	B (20)	-	C (21)	C (21)	D (34)	D (30)

Table 4a: Level of Service Summary - 5-year Build

Intersection Approach (Node #)	AM				PM			Build (5-Year) w/ Mit.
	Existing (2008)	Background (5-Year)	Build (5-Year)	Build (5-Year) w/ Mit.	Existing (2008)	Background (5-Year)	Build (5-Year)	
Elmwood Avenue & Kendrick Road (22)								
EB T TR	C (29)	C (24)	D (41)	D (41)	C (27)	C (23)	C (27)	C (27)
WB L	D (51)	D (51)	D (51)	D (51)	C (25)	C (22)	D (55)	D (55)
WB L L	-	-	-	-	-	-	-	-
WB T T	A (3)	A (3)	A (4)	A (4)	C (22)	C (22)	B (14)	B (14)
NB L LR	C (33)	C (31)	C (33)	C (33)	D (47)	D (41)	C (33)	C (33)
NB L L	-	-	-	-	-	-	-	-
NB R	-	-	-	-	-	-	-	-
Overall	C (28)	C (26)	D (35)	D (35)	C (32)	C (29)	C (27)	D (27)
Lattimore Road & Kendrick Road (25)								
EB L	-	-	-	-	-	-	-	-
EB TR	-	-	-	-	-	-	-	-
WB L	C (24)	D (26)	F (56)	-	E (42)	E (45)	F (374)	-
WB R	B (11)	B (11)	B (12)	-	C (16)	C (17)	C (22)	-
WB TR	-	-	-	-	-	-	-	-
NB L	-	-	-	-	-	-	-	-
NB TR	-	-	-	-	-	-	-	-
SBL	A (9)	A (9)	A (10)	-	A (9)	A (10)	B (11)	-
SBT TR	-	-	-	-	-	-	-	-
Overall	unsignalized	unsignalized	unsignalized	-	unsignalized	unsignalized	unsignalized	-
Lot #1 & Kendrick Road (26)								
EB	B (12)	B (12)	B (13)	-	F (52)	F (70)	F (90)	-
NB	A (9)	A (10)	A (9)	-	A (8)	A (8)	A (9)	-
Overall	unsignalized	unsignalized	unsignalized	-	unsignalized	unsignalized	unsignalized	-
Westmoreland Road & Kendrick Road (27)								
EB	B (15)	C (16)	F (>999)	-	F (190)	F (221)	F (>999)	-
WB L T	F (55)	F (62)	F (>999)	-	C (18)	C (19)	F (190)	-
WB L	-	-	-	-	-	-	-	-
WB R	B (15)	C (15)	-	-	-	-	-	-
NB T TR	A (4)	A (4)	A (5)	-	A (1)	A (1)	A (1)	-
SB	A (9)	A (9)	C (17)	-	A (8)	A (8)	A (9)	-
SB L	-	-	-	-	-	-	-	-
SB T T	-	-	-	-	-	-	-	-
Overall	unsignalized	unsignalized	unsignalized	-	unsignalized	unsignalized	unsignalized	-
Elmwood Avenue & East Drive (91)								
EB T TR	-	-	A (2)	A (2)	-	-	A (4)	-
WB L	B (11)	B (11)	A (7)	A (7)	B (12)	B (12)	A (6)	-
WB T T	-	-	A (2)	A (2)	-	-	A (1)	-
NB L	F (77)	F (70)	E (60)	E (60)	F (51)	F (61)	E (59)	-
NB R	B (10)	A (10)	B (14)	B (14)	B (12)	B (11)	D (39)	-
Overall	unsignalized	unsignalized	A (6)	A (6)	unsignalized	unsignalized	A (9)	-
Kendrick Road & CTSB (100)								
WB	-	-	D (26)	-	-	-	F (201)	-
NB	-	-	-	-	-	-	-	-
SB	-	-	A (1)	-	-	-	A (1)	-
Overall	-	-	unsignalized	-	-	-	unsignalized	-
Elmwood Avenue & South Avenue (162)								
EB L	E (55)	E (56)	C (30)	-	C (26)	C (23)	D (36)	-
EB T TR	C (23)	C (23)	A (10)	-	C (27)	C (26)	D (48)	-
WB L	E (59)	E (64)	D (54)	-	D (54)	E (56)	D (52)	-
WB T TR	D (37)	D (37)	D (39)	-	D (39)	C (39)	C (31)	-
NB LT TR	C (27)	C (25)	C (22)	-	C (27)	C (30)	C (33)	-
SB LT TR	D (37)	C (46)	D (42)	-	D (36)	D (44)	D (44)	-
Overall	D (35)	C (37)	C (32)	-	C (32)	C (34)	D (41)	-

Table 4a: Level of Service Summary - 5-year Build

Intersection Approach (Node #)	AM				PM			Build (5-Year) w/ Mit.
	Existing (2008)	Background (5-Year)	Build (5-Year)	Build (5-Year) w/ Mit.	Existing (2008)	Background (5-Year)	Build (5-Year)	
East River Road & Murlin Drive (172)								
WB	A (1)	-	-	-	A (3)	-	-	-
NB	B (14)	-	-	-	C (17)	-	-	-
Overall	unsignalized	-	-	-	unsignalized	-	-	-
Elmwood Ave & U of R (393)								
EB T TR	B (16)	B (15)	B (15)	-	B (16)	C (23)	B (15)	-
WB L	A (6)	A (6)	A (3)	-	A (5)	A (5)	A (4)	-
WB T T	A (8)	A (8)	A (6)	-	A (6)	A (6)	A (5)	-
NB L	D (35)	D (35)	C (35)	-	C (33)	C (33)	C (32)	-
NB R	B (12)	B (12)	B (12)	-	B (10)	B (10)	B (10)	-
Overall	B (12)	B (12)	B (10)	-	B (11)	B (15)	B (10)	-
Crittenden Boulevard & East Drive (395)								
EB L	A (3)	A (3)	A (4)	-	A (3)	A (3)	A (6)	-
EB T T	A (2)	A (2)	A (3)	-	A (3)	A (3)	A (5)	-
WB T TR	A (2)	A (2)	A (5)	-	A (5)	A (4)	A (4)	-
SB L	D (53)	D (53)	D (50)	-	D (53)	D (53)	C (22)	-
SB R	B (13)	B (13)	B (11)	-	B (10)	B (10)	A (5)	-
Overall	A (6)	A (6)	A (8)	-	A (10)	A (9)	A (7)	-
MCH & E. Henrietta (470)								
EB L	E (56)	E (71)	E (67)	-	D (50)	D (38)	D (38)	D (40)
EB TR	C (25)	C (22)	C (21)	-	B (13)	A (9)	A (9)	A (10)
WB L	D (52)	E (57)	D (55)	-	E (59)	E (63)	E (71)	E (77)
WB TR	C (24)	C (24)	C (22)	-	B (18)	A (8)	A (8)	A (8)
NB L	A (3)	A (6)	B (11)	-	A (2)	A (5)	A (2)	A (1)
NB T TR	A (10)	B (14)	B (12)	-	A (4)	C (28)	A (9)	A (7)
SB L	A (1)	A (7)	B (12)	-	A (1)	D (34)	D (40)	D (51)
SB T TR	A (1)	A (2)	A (2)	-	A (2)	B (18)	F (88)	E (79)
Overall	A (7)	B (11)	B (10)	-	A (5)	C (25)	D (50)	D (45)
E. Henrietta Road & Crittenden/MCC (500)								
EB L	D (53)	D (53)	E (65)	-	F (101)	F (134)	F (134)	F (134)
EB LTR	D (43)	D (44)	D (53)	-	E (77)	F (99)	F (114)	F (114)
WB LT TR	A (1)	A (1)	A (1)	-	C (24)	C (30)	C (30)	C (30)
NB L	F (84)	F (95)	F (85)	-	F (239)	F (285)	F (285)	F (285)
NB T TR	A (8)	A (9)	A (6)	-	B (18)	C (20)	C (20)	C (20)
SB L	A (8)	A (10)	A (7)	-	B (14)	B (16)	B (16)	B (16)
SB T TR	D (39)	F (122)	E (63)	-	C (22)	C (33)	E (56)	E (56)
Overall	C (33)	F (81)	D (50)	-	D (43)	E (55)	E (67)	E (67)
W. Henrietta Road & Southland Drive (501)								
EB LTR	D (46)	D (46)	D (46)	-	C (28)	C (28)	C (28)	-
WB LTR	C (28)	C (27)	C (27)	-	C (21)	C (21)	C (21)	-
NB L	A (4)	A (3)	A (3)	-	A (5)	A (5)	A (5)	-
NB T TR	A (9)	A (8)	A (8)	-	A (8)	A (9)	A (9)	-
SB L	A (3)	A (4)	A (4)	-	A (2)	A (3)	A (3)	-
SB T TR	A (5)	A (6)	A (7)	-	A (4)	A (3)	A (6)	-
Overall	A (7)	A (8)	A (8)	-	A (7)	A (7)	A (8)	-
W. Henrietta Road & Doncaster Road (502)								
EB LTR	D (48)	D (48)	D (48)	-	D (40)	D (40)	D (39)	-
WB LTR	C (34)	C (34)	C (34)	-	D (39)	D (39)	D (40)	-
NB LT TR	A (2)	A (3)	A (3)	-	A (4)	A (5)	A (5)	-
SB T TR	A (3)	A (4)	A (3)	-	A (1)	A (1)	A (2)	-
Overall	A (3)	A (3)	A (3)	-	A (3)	A (3)	A (4)	-

Table 4a: Level of Service Summary - 5-year Build

Intersection Approach (Node #)	AM				PM			Build (5-Year) w/ Mit.
	Existing (2008)	Background (5-Year)	Build (5-Year)	Build (5-Year) w/ Mit.	Existing (2008)	Background (5-Year)	Build (5-Year)	
W. Henrietta Road & Crittenden (503)								
EB LT TR	D (51)	D (52)	D (51)	-	C (23)	C (23)	C (23)	-
WB LT TR	D (37)	D (39)	D (40)	-	E (60)	E (62)	E (63)	-
NB L	A (10)	A (9)	A (9)	-	B (13)	B (12)	B (15)	-
NB T TR	C (29)	C (30)	C (32)	-	D (36)	D (40)	D (41)	-
SB L	C (22)	C (25)	C (28)	-	E (68)	E (75)	E (70)	-
SB T TR	B (13)	B (15)	B (16)	-	C (20)	C (20)	C (26)	-
Overall	C (26)	C (28)	C (29)	-	D (35)	D (37)	D (39)	-
W. Henrietta Road & Brighton Henrietta Town Line Road (504)								
EB L	D (48)	D (49)	D (49)	-	E (67)	E (68)	E (68)	-
EB T TR	D (44)	D (44)	D (44)	-	D (38)	D (38)	D (38)	-
WB L	D (37)	D (38)	D (38)	-	F (183)	F (188)	F (188)	-
WB T TR	D (43)	D (43)	D (43)	-	D (38)	D (38)	D (38)	-
NB L	A (9)	A (9)	A (9)	-	B (12)	B (12)	B (12)	-
NB T TR	B (19)	B (19)	B (20)	-	C (30)	D (40)	D (42)	-
SB L	B (19)	C (24)	C (25)	-	C (25)	C (28)	C (28)	-
SB T TR	C (23)	C (27)	C (27)	-	C (23)	C (27)	C (27)	-
Overall	C (28)	C (30)	C (30)	-	D (42)	D (46)	D (47)	-
East River Road & Crittenden (505)								
WB	B (14)	B (15)	C (15)	-	B (15)	B (15)	C (16)	-
NB	-	-	-	-	-	-	-	-
SB	A (1)	A (1)	A (1)	-	A (1)	A (1)	A (1)	-
Overall	unsignalized	unsignalized	unsignalized	-	unsignalized	unsignalized	unsignalized	-
East River Road & Site Drive (506)								
EB T	-	-	-	-	-	-	-	-
EB R	-	-	-	-	-	-	-	-
WB L	-	A (3)	B (10)	B (10)	-	A (1)	A (4)	A (4)
WB T	-	-	-	-	-	-	-	-
NB L	-	F (83)	F (583)	F (583)	-	C (22)	F (493)	F (493)
NB R	-	B (15)	C (18)	C (18)	-	B (12)	B (13)	B (14)
Overall	-	unsignalized	unsignalized	unsignalized	-	unsignalized	unsignalized	unsignalized

East River Road & Kendrick Road (1)

This signalized intersection currently operates at an overall LOS ‘A’ during the peak hours studied. NYSDOT is currently reconstructing the existing geometry of this intersection. As mentioned earlier, this improvement is included in the NYS DOT’s Design Report and proposed reconstruction plan. A two-lane roundabout will replace the existing signalized intersection at Kendrick Road and East River Road. Murlin Drive (the private road to South Campus) is located to the east of this intersection on the south side of River Road. Relocation of this road to form the southern leg of the roundabout is anticipated to be complete for the 5-year build scenario.

Synchro 8 software was used to analyze the intersection with future 5-year traffic volumes as a roundabout for both AM and PM peak hours. Each movement is anticipated to operate at a LOS ‘C’ or better for the AM and PM peak hours for the future 5-year development. The Synchro analysis sheets are included in **Appendix ‘D’**.

East River Road & I-390 Off-Ramp (2)

This signalized intersection currently operates at an overall LOS ‘B’ during the AM peak hour and at an overall LOS ‘A’ PM peak hour. NYSDOT has proposed a new on-ramp (adjacent to the SB/EB I-390 off-ramp) to provide access from East River Road to SB/EB I-390. As identified in the LOS table, introduction of a SB/EB left-turn at this intersection slightly increases the delay for the WB approach for the PM (background) peak hours. For the Five Year build condition, the WB approach operates at a LOS ‘C’ during the AM and PM peak hour. The intersection is expected to operate at an overall LOS ‘B’ during the AM peak hour and at an overall LOS ‘C’ during the PM peak hour for the Five Year build condition.

Mt. Hope Avenue @ College Town Drive (3)

Proposed in the University of Rochester’s Master Plan, this is a new signalized intersection planned on the mid-block section of Mt. Hope Avenue between Elmwood Avenue and Crittenden Boulevard. For both the no-build and build conditions, it is anticipated to operate at an overall LOS ‘A’ both AM and PM peak hours.

I-390 NB On-Ramp & West Henrietta Road (5)

The existing signalized intersection operates at an overall LOS ‘A’ during the AM peak hour and at an overall LOS ‘D’ during the PM peak hour. To reduce queuing, the NYSDOT is planning to build two separate NB I-390 on-ramps with right exit access from NB W. Henrietta Rd and SB Mt. Hope Avenue. A sketch of the conceptual interchange proposed by the NYSDOT is included in **Appendix K**.

East River Road & West Henrietta Road (6)

This signalized intersection currently operates at an overall LOS ‘C’ during the AM peak hour and at an overall LOS ‘F’ during the PM peak hour. With NYS DOT improvements, it is anticipated to continue to operate at LOS ‘C’ for the AM no-build condition, the PM no-build condition and the PM build condition. The westbound approach delay is expected to increase for the future AM build condition. However, with minor signal timing modifications the westbound through-right lanes are anticipated to improve for the build condition during the AM peak hour. Overall, the intersection is anticipated to operate at LOS ‘D’ during the AM hour and at LOS ‘C’ during the PM hour for the future Five Year build conditions.

I-390 NB On-Ramp & East Henrietta Road (7)

NYS DOT is proposing to reconstruct the existing NB I-390 on/off-ramp. Based on the proposed geometrical design, the following lane configurations were anticipated for the no-build and Five Year build conditions:

- Northbound: 2-left turn lanes and 2-through lanes,
- Southbound: 2-through lanes and an exclusive right turn lane.
- Eastbound: 1-right turn lane
- Westbound: 2-right turn lanes

With the above configuration proposed by NYS DOT, the overall intersection operates at LOS ‘D’ or better during the peak hours studied for both the Five Year no-build and Five Year build conditions.

I-390 SB On-Ramp & East Henrietta Road (8)

The existing signalized intersection operates at an overall LOS ‘E’ during the AM peak hour and LOS ‘D’ during the PM peak hour studied. NYS DOT is planning to modify the lane geometry of the NB and SB approaches. As such, the overall intersection is anticipated to operate at a LOS ‘C’ during the peak hours studied for the future Five Year build condition.

Westfall Road @ East Henrietta Road (10)

This intersection is signalized and operates at an overall LOS ‘D’ during the AM and PM peak hours studied for the existing conditions. Improvements associated with the City Gate development include a new northbound exclusive right-turn lane and an additional westbound left-turn lane. With the background traffic volumes and these improvements added to the analysis, the intersection is anticipated to operate at a LOS ‘E’ or better for the PM peak hour no-build condition and build condition. During the AM peak hour no-build and build conditions the intersection is expected to

operate at an overall LOS ‘D’. However, with minor signal timing adjustments, the overall intersection is anticipated to operate at a LOS ‘D’ for the 5-year build condition.

East Henrietta Road @ South Avenue (11)

This intersection is signalized and currently operates at an overall LOS ‘B’ during both the AM and PM peak hours studied. All movements for the intersection are anticipated to operate at acceptable levels of service for the future 5- year no-build and build conditions.

Crittenden Boulevard @ Mt. Hope Avenue (12)

This signalized intersection currently operates at an overall LOS ‘D’ during both the AM and PM peak hours studied. As a part of The City of Rochester planned improvements to the Mt. Hope Avenue corridor, the addition of an exclusive right-turn lane is planned for the westbound approach and the Ft. Hill Terrace connection removed to the east. With the exception of the northbound left in the PM peak hour, all approaches are anticipated to operate at a LOS ‘D’ or better for the future Five Year build condition.

Elmwood Avenue @ Mt. Hope Avenue (13)

This intersection is signalized and currently operates at an overall LOS ‘D’ during the AM and PM peak hours. The westbound left-turn lane is currently congested and operates at a LOS ‘E’ during the AM peak hour and at a LOS ‘F’ during the PM peak hour. Additionally, the northbound left-turn lane and the eastbound through lane are congested during the AM and PM peak hours respectively. Both movements operate at a LOS ‘E’.

As a part of The City of Rochester planned improvements to the Mt. Hope Avenue corridor, the addition of an exclusive 650 foot right-turn lane is under construction for the westbound approach. For the 5-year build condition, the southbound through/through-right movement is expected to degrade slightly to a LOS ‘E’ during the weekday PM peak hour. With the City of Rochester’s improvements and minor signal timing modifications, this intersection is expected to improve and the intersection is anticipated to operate at an overall LOS ‘D’ and an overall LOS ‘E’ during the AM and PM peak hours, respectively.

Lattimore Road @ Mt. Hope Avenue (14)

This signalized intersection currently operates at an overall LOS ‘A’ during the AM and PM peak hours studied. It is anticipated to continue to operate at an acceptable level of service of ‘B’ or better for the Five Year no-build and Five Year build conditions.

Westfall Road & Mt. Hope Avenue (15)

This intersection is signalized and currently operates at an overall LOS 'C' during the AM peak hour and a LOS 'D' during the PM peak hour. It is anticipated to continue to operate at a current overall Levels of Service for the AM and PM peak hour no-build condition and the build condition. The westbound left-turn movement currently fails during the PM peak hour. However, with minor signal timing adjustments, this movement is anticipated to improve to a LOS 'D' for the PM peak hour Five Year Build condition.

East Henrietta Road & Iola Circle (18)

The westbound approach for this unsignalized intersection operates at a LOS 'F' during the AM peak hour studied for the existing conditions. Improvements associated with the City Gate development include the installation of exclusive left-turn lanes on the northbound and southbound approaches and a traffic control signal. As such, the background and build conditions were analyzed with an actuated-coordinated traffic signal for the AM and PM peak hours. With these improvements added to the analysis, the intersection is anticipated to operate at a LOS 'B' or better for both AM and PM peak hour no-build and build conditions.

Crittenden Boulevard @ Kendrick Road (21)

This intersection is signalized. The intersection currently operates at an overall LOS 'B' during the AM peak hour and at an overall LOS 'C' during the PM peak hour. It is anticipated to operate at similar levels for no-build and build conditions. However, the westbound left/through movement is anticipated to fail during the Five Year Build condition. With minor signal timing adjustments, the movement is anticipated to improve to a LOS 'D'.

Elmwood Avenue @ Kendrick Road (22)

This intersection is signalized and currently operates at an overall LOS 'C' during the peak hours studied and is anticipated to continue to operate at current levels of service for the AM and PM no-build 5-year conditions.

Lattimore Road @ Kendrick Road (25)

With the exception of the westbound left-turn lane that operates at a LOS 'E' during the PM peak hour, all movements for the stop controlled intersection currently operate at a LOS 'D' or better during the peak hours studied. Although the WB left-turn lane is expected to experience increased delays during the AM and PM peak hours, the approach volume is low with respect to the NB and SB

volumes. Thus, the intersection is expected to continue to operate with slight delays on the minor street for the 5-year no-build and build conditions.

Lot #1 @ Kendrick Road (26)

Located just south of Lattimore Road on the west side of Kendrick Road, all approaches for this unsignalized intersection currently operate at a LOS 'B' or better during the AM and PM peak hours studied, with the exception of the eastbound approach which operates at LOS 'F' during the PM peak hour. This intersection is not expected to degrade further during the AM and PM peak hours studied for the 5-year no-build and build conditions.

The existing driveway for parking lot #9 located on the east side of Kendrick Road just south of the driveway for Lot #1 was not included in the analysis. As such, it is presumed that this lot accounts for the differentiation between traffic volume on Kendrick Road between Lot #1 and Westmoreland Drive. A University of Rochester Parking Area Map is included in **Appendix I** to identify the location of parking areas along Kendrick Road.

Westmoreland Road @ Kendrick Road (27)

With the exception of the westbound left/through movement during the AM peak hour and the eastbound movement during the PM peak hour, all movements for the stop controlled intersection currently operate at a LOS 'D' or better during the peak hours studied. Due to increased traffic associated with the five year build, the minor approaches are anticipated to experience alternating increased delays during the peak hours studied for the 5-year no-build and build conditions.

Elmwood Avenue @ East Drive (91)

For the existing conditions, the northbound approach is controlled by a stop sign. As such, the left-turn lane operates at a LOS 'F' during both the AM and PM peak hours studied. Within the past year, a new traffic signal has been installed at this intersection. As such, it is included in the background analysis for Five Year. All movements for this intersection are projected to operate at a LOS 'E' or better during the peak hours studied for the 5-year no-build and build conditions.

Kendrick Road @ CTSB (100)

Proposed in the University of Rochester's Master Plan, this is an unsignalized intersection planned on the mid-block section of Kendrick Road Crittenden Boulevard and Lattimore Road. For the build conditions, the approaches are anticipated to operate at an overall LOS 'D' or better both AM and PM

peak hours. However, the westbound minor approach is anticipated to experience failing levels of service during the PM peak hour.

Elmwood Avenue @ South Avenue (162)

This intersection is signalized and currently operates at an overall LOS 'D' during the AM peak hour and at an overall LOS 'C' during the PM peak hour. It is anticipated to degrade slightly to an overall LOS 'D' for the PM 5-year build condition.

East River Road @ Murlin Drive (172)

For the existing conditions, all movements at this stop controlled intersection operate at a LOS 'C' or better during the AM and PM peak hours. The future analysis for this intersection is combined with the analysis for the new roundabout at Kendrick Road and East River Road. Relocation of this road to form the southern leg of the roundabout is planned to be complete for the 5-year build scenario.

Elmwood Avenue @ Eastman Dentistry Driveway (393)

This newly signalized intersection operates at an overall LOS 'B' during the peak hours studied and is anticipated to continue to operate at LOS 'B' for the 5-year no-build and build conditions.

Crittenden Boulevard @ East Drive (395)

This signalized intersection currently operates at an overall LOS 'A' during the peak hours studied and is anticipated to continue to operate at LOS 'A' for the 5-year no-build and build conditions.

Monroe County Health @ East Henrietta Road (470)

This signalized intersection currently operates at an overall LOS 'A' during the peak hours studied and is anticipated to continue to operate at acceptable levels of service for the 5-year no-build and build conditions. However, the southbound through movement is anticipated to fail during the PM peak hour for the 5-year build condition. With minor signal timing modifications, the movement is anticipated to improve to a LOS 'E'.

East Henrietta Road @ Crittenden Boulevard/MCC (500)

This intersection is signalized and currently operates at an overall LOS 'C' during the AM peak hour and a LOS 'D' during the PM peak hour. With the exception of the northbound left-turn lane during the AM and PM peak hours and the eastbound left-turn lane during the PM peak hour, all movements operate at a LOS 'E' or better. With the 5-year no-build conditions, the intersection is anticipated to fail during the AM peak hour and operate at a LOS 'E' during the PM peak hour. With

minor signal timing modifications, the intersection is anticipated to operate at improved levels of service during the AM and PM peak hours.

West Henrietta Road @ Southland Drive (501)

This signalized intersection currently operates at an overall LOS ‘A’ during the peak hours studied and is anticipated to continue to operate at LOS ‘A’ for the 5-year no-build and build conditions.

East Henrietta Road @ Doncaster Road (502)

This signalized intersection currently operates at an overall LOS ‘A’ during the peak hours studied and is anticipated to continue to operate at LOS ‘A’ for the 5-year no-build and build conditions.

West Henrietta Road @ Crittenden Road (503)

This intersection is signalized and currently operates at an overall LOS ‘C’ during the AM peak hour and a LOS ‘D’ during the PM peak hour. The intersection is anticipated to continue to operate at current levels of service for the 5-year no-build and build conditions.

West Henrietta Road @ Brighton Henrietta Town Line Road (504)

This intersection is signalized and currently operates at an overall LOS ‘C’ during the AM peak hour and a LOS ‘D’ during the PM peak hour. With the exception of the westbound left-turn lane that fails during the PM peak hour, all movements operate at a LOS ‘E’ or better. With the 5-year no-build and build conditions, the intersection is anticipated to continue to operate at current levels of service.

East River Road & Crittenden Road (505)

All approaches for this unsignalized intersection currently operate at a LOS ‘B’ or better during the AM peak hour studied. The intersection is anticipated to continue to operate at acceptable levels of service for the 5-year no-build and build conditions during the peak hours analyzed.

East River Road & South Campus Site Drive #2 (506)

Identified in the University of Rochester’s Master Plan, this unsignalized intersection is located on East River Road mid-block between the I-390 off ramp and West Henrietta Road. The intersection was not constructed during the time period the traffic volumes were collected and is therefore not included in the existing conditions. However, the intersection is included in the 5-year no-build scenario. With the exception of the northbound left-turn movement during the AM peak hour, all approaches are anticipated to operate at an overall LOS ‘C’ or better both AM and PM peak hours for this condition. For the 5-year build condition, the northbound left-turn movement is anticipated to

fail for the AM and PM peak periods. However, gaps in traffic are anticipated to occur from the adjacent traffic signal to the west resulting in shorter delays for the northbound approach than reported by the Synchro analysis. The site drive is comprised of one lane in and two lanes out. Widening the service road from one lane to two lanes to accommodate the queues for the northbound traffic is recommended.

Table 4b presents a summary of the weekday morning and weekday evening peak hours for the intersection capacity analysis results for the Existing 2008, Background 20-year (no-build), and Future 20-year (build) traffic conditions. The impacts of the proposed project at the studied intersections were assessed by comparing the Levels of Service (LOS) for background traffic with those for future traffic. Transportation improvements were considered where any Level of Service reductions were noted as a result of adding the site-generated traffic. The Synchro Level of Service analyses are provided in **Appendix ‘D’**.

Table 4b: Level of Service Summary – Full Build (20-year)

Intersection Approach (Node #)	AM				PM			
	Existing (2008)	Background (20-year)	Build (20-year)	Build (20-year) w/ Mit.	Existing (2008)	Background (20-year)	Build (20-year)	Build (20-year) w/ Mit.
East River Road & Kendrick Road (1)								
EB LT T	A (5)	-	-	-	B (10)	-	-	-
WB T TR	A (2)	-	-	-	A (5)	-	-	-
SB L LR	A (9)	-	-	-	A (8)	-	-	-
Overall	A (3)	Roundabout	Roundabout	Roundabout	A (8)	Roundabout	Roundabout	Roundabout
East River Road & I-390 Off/On Ramp (2)								
EB L	-	F (104)	F (>999)	D (46)	-	F (226)	F (913)	D (53)
EB T T	B (15)	B (12)	A (9)	-	A (9)	A (4)	A (14)	-
EB LT T	-	-	-	B (16)	-	-	-	D (34)
WB T T	B (16)	-	-	E (76)	A (7)	-	-	D (46)
WB T	-	-	-	-	-	-	-	-
WB R	-	-	-	B (14)	-	-	-	E (63)
WB T TR	-	B (17)	B (12)	-	-	A (4)	A (6)	-
SB L L	A (8)	E (56)	F (224)	E (75)	A (10)	F (112)	F (169)	E (69)
SB R	A (5)	A (1)	A (1)	A (1)	A (3)	A (1)	A (1)	A (1)
Overall	B (10)	C (34)	F (157)	E (56)	A (9)	E (76)	F (310)	D (49)
College Town Drive & Mt. Hope Avenue (3)								
EB L	-	D (45)	D (54)	-	-	D (50)	D (51)	D (51)
EB R	-	D (35)	C (23)	-	-	C (34)	D (36)	D (36)
NB L	-	A (3)	A (1)	-	-	A (5)	B (13)	B (13)
NB T T	-	A (3)	A (2)	-	-	A (2)	A (7)	A (7)
SB T TR	-	A (3)	A (2)	-	-	A (2)	A (2)	A (2)
Overall	-	A (4)	A (2)	-	-	A (4)	A (6)	A (6)
I-390 NB On-Ramp & West Henrietta Road (5)								
NB L	A (10)	-	-	-	D (40)	-	-	-
NB T T	A (1)	Signal	Signal	-	A (1)	Signal	Signal	-
SB T TR	A (9)	Removed	Removed	-	E (59)	Removed	Removed	-
Overall	A (5)	-	-	-	D (39)	-	-	-
East River Road & West Henrietta Road (6)								
EB L	D (45)	E (71)	D (47)	E (59)	E (58)	F (108)	D (52)	E (56)
EB LT TR	C (23)	C (24)	C (26)	B (13)	F (299)	F (984)	C (33)	D (37)
EB R	B (20)	B (17)	B (14)	A (9)	C (36)	B (10)	A (7)	A (9)
WB L	D (44)	C (33)	C (30)	C (25)	D (46)	E (58)	D (52)	E (56)
WB T TR	D (47)	F (110)	F (243)	-	C (30)	D (48)	E (77)	-
WB T T TR	-	-	-	E (60)	-	-	-	D (49)
NB L	D (42)	F (116)	E (78)	E (78)	C (34)	C (28)	C (28)	C (29)
NB T T TR	C (32)	-	-	-	E (58)	-	-	-
NB T T T	-	C (30)	C (35)	C (35)	-	B (11)	B (17)	B (16)
NB R	-	B (12)	B (15)	B (15)	-	A (6)	A (10)	A (10)
SB L	B (12)	-	-	-	F (127)	-	-	-
SB T TR	A (4)	D (38)	F (98)	-	A (5)	C (31)	F (88)	-
SB T T	-	-	-	E (59)	-	-	-	C (31)
SB R	-	-	-	B (12)	-	-	-	A (9)
Overall	C (28)	D (42)	F (102)	D (43)	F (91)	D (33)	D (46)	C (27)

Table 4b: Level of Service Summary – Full Build (20-year)

Intersection Approach (Node #)	AM				PM			
	Existing (2008)	Background (20-year)	Build (20-year)	Build (20-year) w/ Mit.	Existing (2008)	Background (20-year)	Build (20-year)	Build (20-year) w/ Mit.
I-390 NB Ramp & East Henrietta Road (7)								
East Henrietta Road & I-390 NB On/Off Ramp (222)								
EB R	-	D (36)	E (58)	E (58)	-	A (5)	C (21)	-
WB L	F (81)	-	-	-	E (65)	-	-	-
WB LT TR	E (70)	-	-	-	D (48)	-	-	-
WB R	D (54)	-	-	-	B (10)	-	-	-
WB RR	-	F (145)	C (31)	C (31)	-	A (1)	D (39)	-
NB L	B (15)	-	-	-	D (44)	-	-	-
NB LL	-	D (52)	C (24)	C (24)	-	D (50)	E (80)	-
NB TT	A (4)	B (14)	C (30)	C (30)	A (1)	B (19)	B (14)	-
SB TTT	F (81)	-	-	-	C (24)	-	-	-
SB TT	-	F (162)	E (58)	E (58)	-	F (88)	E (78)	-
SB R	A (1)	A (1)	C (24)	C (24)	A (1)	A (1)	B (19)	-
Overall	D (52)	F (89)	D (42)	D (42)	C (23)	D (43)	D (48)	-
I-390 SB Ramp & East Henrietta Road (8)								
EB L	D (53)	D (37)	C (34)	C (34)	D (37)	D (46)	D (43)	D (43)
EB LT TR	D (50)	C (34)	C (32)	C (32)	F (128)	F (90)	E (64)	E (64)
EB R	F (258)	E (70)	E (63)	E (63)	D (49)	B (10)	E (60)	E (60)
NB TTT	D (52)	-	-	-	D (37)	-	-	-
NB TT	-	D (45)	D (42)	D (48)	-	E (56)	D (45)	D (45)
NB R	B (11)	A (8)	A (8)	A (8)	A (1)	A (2)	A (2)	A (2)
SB L	A (8)	-	-	-	C (29)	-	-	-
SB LL	-	D (42)	D (45)	D (45)	-	E (56)	F (127)	F (127)
SB TT	A (7)	D (45)	C (24)	C (24)	A (3)	D (42)	B (13)	B (13)
Overall	E (56)	D (43)	D (35)	D (36)	D (42)	D (45)	D (41)	D (41)
Westfall Road & East Henrietta Road (10)								
EB L	D (46)	C (32)	C (33)	C (33)	D (38)	C (22)	E (65)	E (55)
EB T TR	D (46)	D (42)	D (41)	D (39)	D (53)	D (43)	F (149)	E (65)
WB L	F (81)	-	-	-	E (67)	-	-	-
WB LL	-	E (79)	E (79)	E (79)	-	D (50)	E (70)	E (70)
WB T TR	D (42)	D (36)	D (40)	D (40)	D (42)	C (23)	D (39)	D (40)
NB L	C (21)	E (56)	E (60)	E (60)	C (35)	E (55)	D (49)	E (65)
NB T TR	C (30)	-	-	-	C (27)	-	-	-
NB TT	-	E (56)	E (79)	E (79)	-	F (149)	D (53)	E (72)
NB R	-	B (18)	C (20)	C (20)	-	C (20)	A (4)	A (6)
SB L	F (87)	D (46)	D (53)	D (53)	F (87)	F (176)	F (165)	F (197)
SB T TR	C (26)	D (46)	D (48)	D (48)	C (26)	F (226)	F (108)	F (115)
Overall	D (37)	D (46)	D (53)	D (53)	D (40)	F (124)	F (84)	F (82)
East Henrietta Road & South Ave (11)								
SB LL	D (50)	D (46)	D (55)	-	D (36)	E (76)	D (51)	D (51)
SE TT	A (7)	A (3)	A (3)	-	B (17)	A (4)	A (5)	A (5)
NW T	A (9)	B (12)	B (19)	-	A (9)	B (20)	C (32)	C (32)
NW R	A (1)	A (7)	A (7)	-	A (5)	A (5)	A (7)	A (7)
Overall	B (16)	B (17)	C (21)	-	B (19)	C (29)	C (25)	C (25)

Table 4b: Level of Service Summary – Full Build (20-year)

Intersection Approach (Node #)	AM				PM			
	Existing (2008)	Background (20-year)	Build (20-year)	Build (20-year) w/ Mit.	Existing (2008)	Background (20-year)	Build (20-year)	Build (20-year) w/ Mit.
Crittenden Boulevard & Mt. Hope Avenue (12)								
EB L	D (42)	D (47)	D (42)	D (42)	D (47)	D (44)	C (29)	C (32)
EB LTR	D (49)	-	-	-	D (51)	-	-	-
EB R	D (48)	E (59)	E (54)	D (53)	D (49)	D (58)	D (48)	E (75)
EB R2	-	E (55)	D (48)	D (47)	-	D (52)	C (32)	C (39)
NB L	C (22)	D (53)	E (82)	E (82)	B (18)	D (50)	D (46)	D (46)
NB T TR	D (35)	D (40)	E (56)	E (60)	B (18)	F (95)	F (83)	E (69)
SB L	C (34)	D (45)	D (53)	D (53)	C (21)	F (132)	F (124)	F (143)
SB T TR	D (48)	E (71)	E (58)	E (58)	C (27)	E (56)	C (31)	C (31)
NW L	D (52)	E (76)	E (74)	E (74)	F (113)	F (97)	F (119)	E (61)
NW R	E (58)	C (21)	B (17)	B (17)	E (56)	D (37)	C (33)	C (23)
Overall	D (44)	D (54)	D (53)	D (54)	D (36)	E (71)	E (59)	E (57)
Elmwood Avenue & Mt. Hope Avenue (13)								
EB L	D (41)	F (127)	F (206)	F (209)	E (60)	F (117)	F (285)	F (285)
EB T TR	D (51)	-	-	-	E (66)	-	-	-
EB T T	-	C (35)	E (68)	E (66)	-	E (61)	E (72)	E (73)
EB R	-	B (12)	B (14)	B (12)	-	A (9)	B (10)	B (11)
WB L	E (57)	F (119)	E (66)	E (66)	F (80)	E (66)	F (136)	F (136)
WB T TR	D (38)	D (51)	E (77)	E (77)	B (15)	E (70)	C (35)	C (35)
NB L	E (66)	F (113)	E (78)	E (78)	C (32)	F (90)	F (136)	F (136)
NB T TR	C (26)	C (31)	B (13)	B (13)	D (48)	F (182)	F (149)	F (149)
SB L	B (17)	B (18)	D (38)	D (38)	C (28)	D (37)	C (30)	C (30)
SB T TR	D (39)	E (76)	F (155)	F (155)	D (42)	F (158)	F (116)	F (116)
Overall	D (41)	E (61)	F (88)	F (88)	D (48)	F (118)	F (118)	F (118)
Lattimore Road & Mt. Hope (14)								
EB LR	C (26)	C (26)	C (26)	-	D (43)	D (45)	D (45)	-
NB LT T	A (2)	A (10)	B (18)	-	A (9)	B (11)	B (11)	-
SB T TR	A (1)	A (1)	A (1)	-	A (1)	A (5)	C (23)	-
Overall	A (2)	A (6)	A (9)	-	A (9)	B (11)	C (21)	-
Westfall Road & Mt. Hope Avenue (15)								
EB LT	D (47)	D (49)	D (54)	D (52)	D (52)	D (45)	E (76)	E (76)
EB R	B (12)	B (17)	C (22)	C (22)	B (18)	C (34)	F (110)	F (110)
WB L	C (29)	D (41)	D (38)	C (33)	F (116)	F (151)	F (132)	F (132)
WB TR	C (29)	D (41)	B (17)	-	B (13)	B (19)	D (45)	-
WB LTR	-	-	-	E (56)	-	-	-	E (68)
NB L	B (10)	E (55)	D (45)	D (46)	F (83)	B (18)	D (44)	D (45)
NB T T	B (13)	B (19)	C (34)	D (49)	D (41)	C (30)	C (30)	C (31)
NB R	A (3)	A (9)	C (25)	D (35)	B (19)	B (14)	B (15)	B (15)
SB L	C (35)	E (73)	D (41)	D (41)	E (61)	C (34)	F (89)	F (89)
SB T TR	C (36)	D (47)	C (27)	D (40)	B (14)	F (92)	F (87)	F (87)
Overall	C (22)	C (33)	C (30)	D (44)	D (39)	E (66)	E (73)	E (68)
East Henrietta Road & Iola (18)								
WB	F (61)	-	-	-	C (33)	-	-	-
SB	A (1)	-	-	-	A (1)	-	-	-
WB L	-	E (61)	E (63)	E (63)	-	E (60)	D (55)	D (55)
WB R	-	B (16)	B (16)	B (16)	-	B (15)	C (21)	C (21)
NB T T	-	B (14)	D (52)	D (52)	-	B (14)	C (24)	C (24)
NB R	-	A (1)	A (1)	A (1)	-	A (2)	A (3)	A (3)
SB L	-	D (41)	D (42)	D (42)	-	C (23)	C (28)	C (28)
SB T T	-	A (4)	A (9)	A (9)	-	B (10)	B (12)	B (12)
Overall	unsignalized	B (12)	C (35)	C (35)	unsignalized	B (14)	B (19)	B (19)

Table 4b: Level of Service Summary – Full Build (20-year)

Intersection Approach (Node #)	AM				PM			
	Existing (2008)	Background (20-year)	Build (20-year)	Build (20-year) w/ Mit.	Existing (2008)	Background (20-year)	Build (20-year)	Build (20-year) w/ Mit.
Crittenden Boulevard & Kendrick Road (21)								
EB L	D (37)	F (92)	-	-	D (43)	F (97)	-	-
EB TR	D (34)	D (37)	-	-	D (50)	D (37)	-	-
WB LT T	D (50)	E (64)	-	-	D (45)	E (68)	-	-
WB R	A (10)	B (15)	-	-	B (14)	D (50)	-	-
WB L	-	-	E (58)	-	-	-	D (42)	-
WB R	-	-	B (13)	-	-	-	E (57)	-
NB L	A (4)	B (13)	-	-	A (6)	A (5)	-	-
NB T	A (10)	B (17)	-	-	C (23)	C (23)	-	-
NB R	A (3)	A (3)	-	-	A (8)	A (2)	-	-
NB T TR	-	-	A (5)	-	-	-	B (19)	-
SB L	A (3)	A (3)	A (1)	-	A (9)	C (32)	D (51)	-
SB T	A (8)	E (61)	-	-	A (5)	A (1)	-	-
SB T T	-	-	B (14)	-	-	-	B (16)	-
SB R	A (7)	A (1)	-	-	A (4)	A (1)	-	-
Overall	B (11)	D (40)	B (13)	-	C (21)	C (27)	C (26)	-
Elmwood Avenue & Kendrick Road (22)								
EB T TR	C (29)	F (186)	F (117)	-	C (27)	D (40)	F (126)	-
EB T T	-	-	-	C (26)	-	-	-	D (43)
EB R	-	-	-	E (75)	-	-	-	A (10)
WB L	D (51)	F (92)	F (442)	-	C (25)	F (102)	B (11)	-
WB L L	-	-	-	E (69)	-	-	-	A (2)
WB T T	A (3)	A (4)	A (8)	A (8)	C (22)	C (33)	A (4)	A (4)
NB L LR	C (33)	C (35)	D (40)	-	D (47)	E (61)	F (286)	-
NB L L	-	-	-	D (38)	-	-	-	D (45)
NB R	-	-	-	C (21)	-	-	-	B (12)
Overall	C (28)	F (113)	F (168)	D (47)	C (32)	D (48)	F (152)	C (21)
Lattimore Road & Kendrick Road (25)								
EB L	-	-	D (43)	-	-	-	D (46)	-
EB TR	-	-	C (23)	-	-	-	B (19)	-
WB L	C (24)	F (65)	D (49)	-	E (42)	F (678)	D (51)	-
WB R	B (11)	B (13)	-	-	C (16)	C (17)	-	-
WB TR	-	-	B (20)	-	-	-	B (11)	-
NB L	-	-	C (28)	-	-	-	C (23)	-
NB T R	-	-	B (17)	-	-	-	B (17)	-
SBL	A (9)	A (10)	B (15)	-	A (9)	A (9)	B (11)	-
SBT TR	-	-	C (29)	-	-	-	A (8)	-
Overall	unsignalized	unsignalized	C (24)	-	unsignalized	unsignalized	B (17)	-
Lot #1 & Kendrick Road (26)								
EB	B (12)	D (33)	-	-	F (52)	F (71)	-	-
NB	A (9)	C (16)	-	-	A (8)	B (13)	-	-
Overall	unsignalized	unsignalized	-	-	unsignalized	unsignalized	-	-
Westmoreland Road & Kendrick Road (27)								
EB	B (15)	F (66)	-	-	F (190)	F (102)	-	-
WB L T	F (55)	F (484)	-	-	C (18)	F (>999)	-	-
WB L	-	-	D (37)	D (41)	-	-	D (54)	D (52)
WB R	B (15)	D (34)	D (36)	D (35)	-	B (11)	B (19)	B (17)
NB T TR	A (4)	B (11)	B (11)	B (12)	A (1)	A (1)	A (4)	A (4)
SB	A (9)	A (6)	-	-	A (8)	A (9)	-	-
SB L	-	-	D (38)	C (28)	-	-	A (4)	A (4)
SB T T	-	-	A (1)	A (1)	-	-	A (3)	A (3)
Overall	unsignalized	unsignalized	B (12)	B (12)	unsignalized	unsignalized	A (4)	A (4)

Table 4b: Level of Service Summary – Full Build (20-year)

Intersection Approach (Node #)	AM				PM			
	Existing (2008)	Background (20-year)	Build (20-year)	Build (20-year) w/ Mit.	Existing (2008)	Background (20-year)	Build (20-year)	Build (20-year) w/ Mit.
Elmwood Avenue & East Drive (91)								
EB T TR	-	D (38)	A (10)	-	-	A (10)	A (7)	-
WB L	B (11)	C (27)	A (7)	-	B (12)	B (18)	C (25)	-
WB T T	-	C (26)	B (11)	-	-	B (12)	A (4)	-
NB L	F (77)	C (32)	D (45)	-	E (51)	D (46)	D (47)	-
NB R	B (10)	A (6)	A (9)	-	B (12)	D (50)	E (56)	-
Overall	unsignalized	C (29)	B (11)	-	unsignalized	B (16)	B (12)	-
Kendrick Ave & I390 NB On Ramp (109)								
NB L	-	A (9)	A (1)	-	-	B (11)	D (55)	-
NB T	-	-	E (67)	-	-	-	A (10)	-
SB T	-	-	A (1)	-	-	-	B (13)	-
SB R	-	-	A (1)	-	-	-	A (2)	-
Overall	-	unsignalized	D (48)	-	-	unsignalized	B (15)	-
Kendrick Ave & Alpha Street (117) Background Intersection - Kendrick Ave & CTSB (100)								
WB	-	D (27)	-	-	-	F (109)	-	-
NB	-	-	-	-	-	-	-	-
SB	-	A (9)	-	-	-	A (9)	-	-
EB L	-	-	D (54)	-	-	-	F (98)	-
EB TR	-	-	B (17)	-	-	-	A (8)	-
WB L	-	-	D (53)	-	-	-	E (66)	-
WB TR	-	-	B (16)	-	-	-	C (27)	-
NB L	-	-	A (4)	-	-	-	A (3)	-
NB T TR	-	-	A (5)	-	-	-	A (3)	-
SB L	-	-	A (2)	-	-	-	A (4)	-
SB T TR	-	-	A (9)	-	-	-	A (6)	-
Overall	-	unsignalized	A (9)	-	-	unsignalized	B (15)	-
Elmwood Avenue & South Avenue (162)								
EB L	E (55)	E (69)	E (72)	E (70)	C (26)	C (36)	B (18)	B (17)
EB T TR	C (23)	B (14)	B (14)	B (11)	C (27)	D (41)	E (58)	E (57)
WB L	E (59)	E (56)	E (56)	E (56)	D (54)	F (91)	E (76)	E (76)
WB T TR	D (37)	E (68)	E (71)	E (71)	D (39)	D (42)	D (41)	D (41)
WB T T	-	-	-	-	-	-	-	-
WB R	-	-	-	-	-	-	-	-
NB LT TR	C (27)	C (25)	C (31)	C (30)	C (27)	C (26)	D (41)	D (43)
SB LT TR	D (37)	D (54)	E (75)	E (75)	D (36)	D (56)	E (68)	E (68)
Overall	D (35)	D (48)	D (54)	D (54)	C (32)	D (43)	D (52)	D (51)
East River Road & Murlin Drive (172)								
EB T	-	-	-	-	-	-	-	-
WBT	-	-	-	-	-	-	-	-
WB L	A (1)	-	-	-	A (3)	-	-	-
NB LR	B (14)	-	-	-	C (17)	-	-	-
Overall	unsignalized	-	-	-	unsignalized	-	-	-
Elmwood Ave & U of R (393)								
EB T TR	B (16)	B (19)	B (15)	-	B (16)	B (16)	A (5)	-
WB L	A (6)	A (3)	A (4)	-	A (5)	A (4)	B (13)	-
WB T T	A (8)	A (4)	A (4)	-	A (6)	A (2)	A (4)	-
NB L	D (35)	C (34)	C (35)	-	C (33)	C (32)	C (32)	-
NB R	B (12)	B (11)	B (12)	-	B (10)	A (10)	A (10)	-
Overall	B (12)	B (11)	A (9)	-	B (11)	A (10)	A (5)	-

Table 4b: Level of Service Summary – Full Build (20-year)

Intersection Approach (Node #)	AM			Build (20-year) w/ Mit.	PM			Build (20-year) w/ Mit.
	Existing (2008)	Background (20-year)	Build (20-year)		Existing (2008)	Background (20-year)	Build (20-year)	
Crittenden Boulevard & East Drive (395)								
EB L	A (3)	A (4)	A (3)	-	A (3)	A (5)	A (7)	-
EB T T	A (2)	A (3)	A (2)	-	A (3)	A (5)	A (7)	-
WB T TR	A (2)	A (1)	A (1)	-	A (5)	A (1)	A (3)	-
SB L	D (53)	D (50)	D (50)	-	D (53)	D (46)	D (46)	-
SB R	B (13)	B (12)	B (12)	-	B (10)	A (7)	A (7)	-
Overall	A (6)	A (7)	A (6)	-	A (10)	A (9)	B (11)	-
MCH & E. Henrietta (470)								
EB L	E (56)	E (73)	E (74)	E (74)	D (50)	D (36)	D (36)	D (36)
EB TR	C (25)	B (19)	B (19)	B (19)	B (13)	A (8)	A (8)	A (8)
WB L	D (52)	D (54)	D (54)	D (54)	E (59)	E (65)	E (65)	E (65)
WB TR	C (24)	C (24)	C (27)	C (27)	B (18)	A (7)	A (7)	A (7)
NB L	A (3)	C (22)	C (26)	C (26)	A (2)	A (8)	A (2)	A (2)
NB T TR	A (10)	D (54)	D (54)	D (54)	A (4)	D (49)	C (22)	C (22)
SB L	A (1)	B (14)	B (16)	B (16)	A (1)	D (46)	C (33)	C (33)
SB T TR	A (2)	A (4)	A (3)	A (3)	A (2)	F (88)	E (77)	E (77)
Overall	A (7)	C (33)	C (33)	C (33)	A (5)	E (65)	D (49)	D (49)
E. Henrietta Road & Crittenden/MCC (500)								
EB L	D (54)	D (52)	D (52)	E (76)	F (101)	F (204)	F (204)	F (197)
EB LTR	D (43)	D (44)	D (44)	E (61)	E (77)	F (158)	F (158)	F (150)
WB LT TR	A (1)	A (1)	A (1)	A (1)	C (24)	D (42)	D (42)	C (33)
NB L	F (84)	F (129)	F (129)	F (110)	F (244)	F (358)	F (358)	F (300)
NB T TR	A (8)	B (11)	B (11)	A (7)	B (18)	C (23)	C (23)	C (20)
SB L	A (8)	B (12)	B (12)	A (5)	B (14)	C (22)	C (22)	B (13)
SB T TR	D (39)	F (184)	F (183)	F (112)	C (22)	F (106)	F (106)	E (63)
Overall	C (34)	F (128)	F (127)	F (83)	D (43)	F (105)	F (105)	F (83)
W. Henrietta Road & Southland Drive (501)								
EB LTR	D (46)	D (47)	D (47)	-	C (28)	C (25)	C (25)	-
WB LTR	C (28)	C (26)	C (26)	-	C (22)	C (28)	C (28)	-
NB L	A (4)	A (3)	A (3)	-	A (5)	A (5)	A (5)	-
NB T TR	A (9)	A (7)	A (7)	-	A (8)	B (12)	B (12)	-
SB L	A (3)	A (4)	A (4)	-	A (2)	A (6)	A (6)	-
SB T TR	A (5)	A (4)	A (4)	-	A (4)	A (3)	A (2)	-
Overall	A (7)	A (6)	A (6)	-	A (7)	A (9)	A (9)	-
W. Henrietta Road & Doncaster Road (502)								
EB LTR	D (48)	D (49)	D (48)	-	D (40)	D (39)	D (39)	-
WB LTR	C (34)	C (33)	C (33)	-	D (39)	D (39)	D (39)	-
NB LT TR	A (2)	A (3)	A (3)	-	A (4)	A (7)	A (7)	-
SB T TR	A (3)	A (3)	A (3)	-	A (1)	A (1)	A (1)	-
Overall	A (3)	A (3)	A (3)	-	A (3)	A (5)	A (5)	-
W. Henrietta Road & Crittenden (503)								
EB LT TR	D (51)	E (58)	E (57)	D (49)	C (23)	C (23)	C (23)	C (23)
WB LT TR	D (38)	E (58)	E (69)	D (51)	E (60)	F (130)	F (132)	F (117)
NB L	A (10)	A (9)	A (9)	A (7)	B (13)	B (13)	B (13)	C (28)
NB T TR	C (29)	D (38)	D (39)	C (26)	D (36)	E (75)	F (80)	D (47)
SB L	C (22)	E (76)	F (88)	D (49)	E (68)	F (131)	F (134)	F (156)
SB T TR	B (13)	B (10)	B (10)	C (22)	C (20)	C (29)	C (26)	C (32)
Overall	C (26)	D (37)	D (41)	C (31)	D (35)	E (67)	E (69)	E (57)

Table 4b: Level of Service Summary – Full Build (20-year)

Intersection Approach (Node #)	AM				PM			
	Existing (2008)	Background (20-year)	Build (20-year)	Build (20-year) w/ Mit.	Existing (2008)	Background (20-year)	Build (20-year)	Build (20-year) w/ Mit.
W. Henrietta Road & Brighton Henrietta Town Line Road (504) D								
EB L	D (48)	E (64)	E (64)	D (46)	E (67)	F (108)	F (108)	D (50)
EB T TR	D (44)	D (43)	D (43)	D (48)	D (38)	D (38)	D (38)	D (43)
WB L	D (37)	D (41)	D (41)	D (37)	F (176)	F (299)	F (299)	F (178)
WB T TR	D (43)	D (42)	D (42)	D (48)	D (38)	D (40)	D (40)	D (46)
NB L	A (9)	B (12)	B (12)	B (15)	B (12)	B (13)	B (13)	B (16)
NB T TR	B (19)	C (26)	C (27)	C (30)	C (31)	F (123)	F (130)	F (104)
SB L	B (20)	D (38)	D (42)	D (47)	C (26)	D (36)	D (36)	F (134)
SB T TR	C (23)	C (33)	C (33)	B (16)	C (23)	F (90)	F (92)	F (87)
Overall	C (28)	D (35)	D (36)	C (31)	D (42)	F (105)	F (108)	F (91)
East River Road & Crittenden (505)								
WB	B (15)	C (18)	C (19)	-	B (15)	C (19)	C (21)	-
NB	-	-	-	-	-	-	-	-
SB	A (1)	A (1)	A (1)	-	A (1)	A (1)	A (1)	-
Overall	Unsignalized	Unsignalized	Unsignalized	-	Unsignalized	Unsignalized	Unsignalized	-
East River Road & Site Drive (506)								
EB T	-	-	-	-	-	-	-	-
EB T TR	-	-	-	E (69)	-	-	-	B (15)
EB R	-	-	-	-	-	-	-	-
WB L	-	C (18)	F (71)	-	-	A (3)	A (5)	-
WB LT TT	-	-	-	B (17)	-	-	-	B (19)
WB T	-	-	-	-	-	-	-	-
NB L	-	F (>999)	F (>999)	E (55)	-	F (92)	F (656)	B (19)
NB R	-	C (19)	C (20)	B (13)	-	B (11)	B (15)	A (4)
Overall	-	unsignalized	unsignalized	D (43)	-	Unsignalized	Unsignalized	B (16)
Beta and Kendrick Road (507)								
EB L	-	-	D (49)	-	-	-	C (30)	-
EB TR	-	-	B (18)	-	-	-	A (5)	-
WB L	-	-	D (52)	-	-	-	C (32)	-
WB TR	-	-	B (20)	-	-	-	B (11)	-
NB L	-	-	A (7)	-	-	-	A (7)	-
NB T TR	-	-	A (6)	-	-	-	B (12)	-
SB L	-	-	A (5)	-	-	-	B (14)	-
SB T TR	-	-	B (16)	-	-	-	A (8)	-
Overall	-	-	B (13)	-	-	-	B (11)	-

East River Road & Kendrick Road (1)

This signalized intersection currently operates at an overall LOS 'A' during the peak hours studied.

However due to the increased volumes anticipated with future growth and new I-390 on/off ramps, NYSDOT is currently reconstructing the existing geometry of this intersection. As mentioned earlier, this improvement is included in the NYS DOT's Design Report and proposed reconstruction plan. A two-lane roundabout will replace the existing signalized intersection at Kendrick road and East River Road. Murlin Drive (the private road to South Campus) is located to the east of this intersection on the south side of River Road. Relocation of this road to form the southern leg of the roundabout is included in the 20-year build scenario.

Synchro 8 software was used to analyze the intersection with future 20-year traffic volumes as a roundabout for both AM and PM peak hours. Each movement is anticipated to operate at a LOS 'C' or better for the AM and PM peak hours for the future 20-year full development. The Synchro analysis sheets are included in **Appendix 'D'**.

East River Road & I-390 On/Off-Ramp (2)

This signalized intersection currently operates at an overall LOS 'B' during the AM peak hour and at an overall LOS 'A' during the PM peak hour. Improved access to NB I-390 is among improvements the NYSDOT is intending to do in the area. For the 20-year analysis, an on-ramp (adjacent to the NB I-390 off-ramp) is anticipated to be fully functional providing access from East River road to EB I-390. Due to normal projected growth, the intersection's overall delay is expected to increase slightly during the 20-year no-build scenario.

Increased delays are anticipated during the 20-year build conditions. Without additional modification, this signalized intersection is expected to operate at an overall LOS 'F' during the AM and PM peak hours for the 20-year build condition. However, with slight modifications to the signal timings and cycle length, the intersection is anticipated to operate at an overall LOS 'E' during the AM peak hour and at an overall LOS 'D' during the PM peak hour. The future scenarios with mitigation were modeled with 2-through lanes and an exclusive right-turn lane for the westbound approach.

Mt. Hope Avenue @ College Town Drive (3)

This is a new signalized intersection proposed in the University of Rochester's Master Plan for construction within the first five years of development. It is located on the mid-block section of Mt. Hope Avenue between Elmwood Avenue and Crittenden Boulevard and will primarily service the

College Town Development. For both the 20-year no-build and build conditions, it is anticipated to operate at an overall LOS 'A' both AM and PM peak hours.

I-390 NB On-Ramp & West Henrietta Road (5)

The existing signalized intersection operates at an overall LOS 'A' during the AM peak hour and at an overall LOS 'D' during the PM peak hour. To reduce queuing associated with the northbound left-turning vehicles, the NYSDOT is planning to build a new NB I-390 on-ramp (1/4 cloverleaf) with right-movement access from NB West Henrietta Rd to I-390 NB. A sketch of the conceptual interchange proposed by the NYSDOT is included in **Appendix 'K'**.

East River Road & West Henrietta Road (6)

This signalized intersection currently operates at an overall LOS 'C' during the AM peak hour and at an overall LOS 'F' during the PM peak hour. Currently, NYSDOT is proposing to reconstruct the existing intersection. Based on the proposed geometrical design, the following lane configurations were anticipated for the no-build and 20-year build conditions:

- Northbound: 1-left turn lane, 3-through lanes and an exclusive right turn lane ,
- Southbound: 1-through lane and a shared through/right turn lane.
- Eastbound: 1-left turn lane, a shared left-turn/through lane, a shared through/right-turn lane and an exclusive right turn.
- Westbound: 1-left turn lane, a through lane and a shared through/right-turn lane.

With the NYS DOT improvements in place, the intersection is anticipated to operate at a LOS 'D' for the AM and PM peak hours during the 20-year no-build conditions.

For the 20-year build condition, the intersection is anticipated to fail during the AM peak hour. A majority of the existing and future traffic associated with the University of Rochester originating from I-390 NB is expected to travel westward through this intersection. Additionally, with the construction of the I-390 SB on-ramp on East River Road, the southbound right turn is expected to be heavy during the peak hours. As such, an additional westbound through lane and a southbound exclusive right-turn lane are proposed at this intersection. With the proposed additional lanes the intersection is anticipated to operate a LOS 'D' during the AM peak hour and at a LOS 'C' during the PM peak hour. All movements are anticipated to operate at a LOS 'E' or better.

I-390 NB On/Off-Ramp & East Henrietta Road (7)

NYSDOT is proposing to reconstruct the existing NB I-390 on/off-ramp. Based on the geometrical design proposed by NYS DOT, the following lane configurations were anticipated for the 20-year no-build and 20-year build conditions:

- Northbound: 2-left turn lanes and 2-through lanes,
- Southbound: 2-through lanes and an exclusive right turn lane.
- Eastbound: 1-right turn lane
- Westbound: 2-right turn lanes

With the above configuration the overall intersection operates at a LOS 'D' during the AM peak hour and at a LOS 'C' during the PM peak hour for the 20-year build condition.

I-390 SB On-Ramp & East Henrietta Road (8)

The existing signalized intersection operates at an overall LOS 'E' during the AM peak hour and at an overall LOS 'D' during the PM peak hour. NYSDOT is planning to modify the lane geometry of the NB and SB approaches. As such, the overall intersection is anticipated to operate at a LOS 'D' during the peak hours studied for the future 20-year build condition.

Westfall Road @ East Henrietta Road (10)

This signalized intersection operates at an overall LOS 'D' during the AM and PM peak hours for the existing conditions. Improvements associated with the City Gate development include constructing a new northbound exclusive right-turn lane and installing an additional westbound left-turn lane. With these improvements added to the analysis, the intersection is anticipated to operate at a LOS 'D' during the AM peak hour for the 20-year no-build and build conditions.

The intersection is expected to fail during the PM peak hour 20-year no-build and build conditions. However, with minor signal timing adjustments, the overall intersection is anticipated to operate at a LOS 'D' during the AM peak hour and individual movements are anticipated to improve during the PM peak hour for the 20-year build condition. Additionally, the southbound left-turn lane is currently over capacity during the PM peak hour and is projected to have failing levels of service over the next 20 years during the weekday evening peak. There are no plans to add more lanes to the southbound approach as the approach is constricted by ROW and structures on both sides of the intersection

East Henrietta Road @ South Avenue (11)

This intersection is signalized and currently operates at an overall LOS 'B' during the peak hours studied. The SB dual left-turn movement currently experiences higher levels of delay in comparison

to the northbound and southeast movements. The delay for this movement is expected to continue to increase to a LOS 'E' for the future 20-year no-build condition. However, with minor signal modifications for the future 20-year build condition to balance the intersection, the SB delay will decrease enabling all movements to operate at a LOS 'D' or better for the 20-year build condition. As such, the intersection is anticipated to operate at an overall LOS 'C' for both the AM and PM peak hours for the future 20-year build condition.

Crittenden Boulevard @ Mt. Hope Avenue (12)

This signalized intersection currently operates at an overall LOS 'D' during the peak hours studied. As a part of The City of Rochester planned improvements to the Mt. Hope Avenue corridor, the addition of an exclusive right-turn lane is planned for the westbound approach and the Ft. Hill Terrace connection removed to the east. With the exception of the southbound left movement and the northbound left-turn movement in the PM peak hour, all approaches are anticipated to operate at a LOS 'E' or better for the future 20-year build condition. The southbound and northbound left turn movements are anticipated fail during the PM peak hour and delays are expected to increase for the 20-year build condition. Signal timing modifications applied to the PM future condition may reduce the intersections overall delay. However the southbound left-turn movement is expected to remain overcapacity. This intersection should be observed as the University's development occurs and mitigation options such as left-turn restrictions may be explored.

Elmwood Avenue @ Mt. Hope Avenue (13)

This signalized intersection currently operates at an overall LOS 'D' during the AM and PM peak hours studied. The westbound left-turn lane is congested and currently operates at a LOS 'E' during the AM peak hour and at a LOS 'F' during the PM peak hour. Additionally, the northbound left-turn is congested during the AM peak hour and operates at a LOS 'E' and the eastbound through lanes operate at a LOS 'E' during the PM peak hour.

The City of Rochester is planning to add an exclusive right-turn lane to the WB approach as part of the Mt. Hope Avenue corridor improvements. Although this improvement is expected to relieve existing congestion at the intersection, it is anticipated that this intersection will remain on the at borderline failure, without other sustainability or Travel Demand Management (TDM) measures in place (e.g., increased transit / shuttle usage, ride-sharing, variations to timing of worker shift changes, etc.).

Future 20-year no-build and 20-year build scenarios were modeled with the City of Rochester's planned intersection improvements. Despite projected improvements, the intersection's overall LOS is anticipated to degrade for both scenarios. Although adding an exclusive SB right-turn lane could improve the intersection, geometrical constraints limit further potential improvements. As such, the intersection is expected to fail for the 20-year build condition during the PM peak hour.

Lattimore Road @ Mt. Hope Avenue (14)

This signalized intersection currently operates at an overall LOS 'A' during the AM and PM peak hours studied. It is anticipated to operate at LOS 'C' or better for the 20-year no-build and build conditions.

Westfall Road & Mt. Hope Avenue (15)

This intersection is signalized and currently operates at an overall LOS 'C' during the AM peak hour and a LOS 'D' during the PM peak hour. It is anticipated to degrade slightly to a LOS 'E' for the PM peak hour 20-year no-build and 20-year build conditions. During the existing PM peak hour the westbound left-turn movement fails. With to increased traffic, the westbound left is expected to degrade further for the future no-build and build conditions. Additionally, the southbound through movement is expected to degrade to a LOS 'F' for the future 20-year no-build and build scenarios during the PM peak hour.

To mitigate the delays anticipated for the 20-year build conditions, a lane reassignment is proposed for the westbound approach. The existing WB approach is proposed to be restriped from an exclusive left-turn lane and a through/right-turn lane to an exclusive left-turn lane and a left-turn/through/right-turn lane. Along with minor signal timing/phasing adjustments such as splitting the eastbound/westbound phase all movements are anticipated to improve during the peak hours studied for the 20-year build condition.

East Henrietta Road & Iola Circle (18)

The westbound approach for this unsignalized intersection operates at a LOS 'F' during the AM peak hour for the existing conditions. Improvements associated with the City Gate development include construction of exclusive left-turn lanes for the northbound and southbound approaches and installation of a traffic signal. As such, the background and build conditions were analyzed with an actuated-coordinated traffic signal for the AM and PM peak hours. With these improvements added to the analysis, the intersection is anticipated to operate at a LOS 'C' or better for both AM and PM peak hour 20-year no-build conditions and the PM peak hour 20-year build condition.

Crittenden Boulevard @ Kendrick Road (21)

This signalized intersection has currently four approaches. The intersection currently operates at an overall LOS 'B' during the AM and PM peak hours studied. The intersection is anticipated have increased delays during the AM peak hour 20-year no-build condition. This is primarily due to the increased volume expected in the southbound through lane due to projected growth.

With the future realignment of Kendrick Road and the planned modifications outlined in the Campus Master Plan, the westerly leg of the intersection will be eliminated. As such the new three-leg approach intersection is anticipated to operate at an overall LOS 'D' or better for 20-year build scenario during the AM and PM peak hours. The westbound left-turn movement is expected to have the highest delay with a LOS 'E' for the 20-year build AM peak hour.

Elmwood Avenue @ Kendrick Road (22)

This intersection is signalized and currently operates at an overall LOS 'C' during the peak hours studied. It is anticipated to degrade to an overall LOS 'F' for AM 20-year no-build condition and to an overall LOS 'D' for the PM 20-year no-build condition.

During both AM and PM peak hours, the westbound left turn movement is projected to experience increased congestion under the build condition and the intersection is anticipated to operate at an overall LOS 'F'. Along with signal timing modifications, geometrical modifications to the intersection are recommended to mitigate the increased levels of delay. Dual WB left-turns are proposed to mitigate the additional traffic anticipated through the intersection, which will improve operation to an overall LOS 'D' or better for the 20-year build condition during the AM and PM peak hours.

Lattimore Road @ Kendrick Road (25)

Each approach for this unsignalized intersection currently operates at a LOS 'E' or better during the AM and PM peak hours studied. With the exception of the westbound left-turn, the approaches are expected to operate at a LOS 'C' or better for the 20-year no-build conditions.

Due to the increase in traffic associated with the realignment of Kendrick Road and modifications to the Campus, it is anticipated that a traffic signal will be required at this intersection for the 20-year build condition. With the traffic signal in place and modifications to Kendrick Road, the intersection is anticipated to operate at an overall LOS 'B' during the AM peak hour and at an overall LOS 'D' during the PM peak hour.

Lot #1 @ Kendrick Road (26)

Located just south of Lattimore Road on the west side of Kendrick Road, all approaches for this unsignalized intersection currently operate at a LOS 'B' or better during the AM and PM peak hours studied, with the exception of the eastbound approach which operates at LOS 'F' during the PM peak hour. This intersection is expected to degrade further during the AM and PM peak hours studied for the 20-year no-build conditions.

The existing driveway for parking lot #9 located on the east side of Kendrick Road just south of the driveway for Lot #1 was not included in the analysis. As such, it is presumed that this lot accounts for the differentiation between traffic volume on Kendrick Road between Lot #1 and Westmoreland Drive. A University of Rochester Parking Area Map is included in **Appendix I** to identify the location of parking areas along Kendrick Road.

With the realignment of Kendrick Road and the modifications to the Campus, the existing parking lots and driveway along Kendrick Road are proposed to be removed or relocated. As such, the intersection of Kendrick Road/ Lot #1 driveway was not included in the analysis for the 20-year future build condition.

Westmoreland Road @ Kendrick Road (27)

With the exception of the eastbound and westbound left-turn movements which fail, all approaches for this unsignalized intersection currently operates at a LOS 'C' or better during the AM and PM peak hours studied. With the exception of the eastbound and westbound left-turn movements, all movements are expected to operate at a LOS 'D' or better for the 20-year no-build conditions.

Due to the increase in traffic associated with the realignment of Kendrick Road and modifications to the Campus, it is anticipated that a traffic signal will be required at this intersection for the 20-year build condition. Once signalized, the intersection is anticipated to operate at an overall LOS 'B' during the AM peak hour and at an overall LOS 'A' during the PM peak hour.

Elmwood Avenue @ East Drive (91)

The northbound approach is currently controlled by a stop sign. As such, the left-turn lane operates at a LOS 'F' during both the AM peak hour and at a LOS 'E' studied. . Within the past year, a new traffic signal has been installed at this intersection. As such, it is included in the background analysis for 20-year. All movements for this intersection are projected to operate at a LOS 'E' or

better during the peak hours studied for the 20-year no-build and build conditions. The traffic signal warrant recommendation letter is included in **Appendix ‘E’**.

I-390 On-Ramp @ Kendrick Road (109)

NYS DOT is proposing to construct a northbound on-ramp onto I-390 from Kendrick Road at a point just south of the Erie Canal. This improvement is included in the NYS DOT’s proposed I-390 Reconstruction Project. Along with improvements to the bridge over I-390 and reconstruction of the intersection of Kendrick Road and East River Drive, this unsignalized intersection is assumed to be in place for the future scenarios analyzed in this study. The following lane configurations were anticipated for the no-build and 20-year build conditions:

- Northbound: 1-left turn lane and 1-through lane,
- Southbound: 1-through lane and an exclusive right turn lane.

With the above configuration the northbound left-turn movement operates at a LOS ‘D’ during the AM peak hour and at a LOS ‘B’ during the PM peak hour for the 20-year build condition.

Alpha Street @ Kendrick Road (177)

This future signalized intersection is proposed to replace the CTSB driveway that was analyzed in the five year scenario. For the purpose of this study, the lane configurations are presumed for the 20-year no-build condition. Based on the University’s Master Plan the following lane configurations were anticipated for the 20-year build conditions:

- Northbound: 1-left turn lane, 1-through lane and a shared through/right-turn lane,
- Southbound: 1-left turn lane, 1-through lane and a shared through/right-turn lane,
- Eastbound: 1-left turn lane and a shared through/right-turn lane,
- Westbound: 1-left turn lane and a shared through/right-turn lane,

Due to the increase in traffic associated with the realignment of Kendrick Road and modifications to the Campus, it is anticipated that a traffic signal will be required at this intersection for the 20-year build condition. With the traffic signal in place and modifications to Kendrick Road, the intersection is anticipated to operate at an overall LOS ‘B’ or better during the AM and PM peak hour 20-year build conditions.

Elmwood Avenue @ South Avenue (162)

This intersection is signalized and currently operates at an overall LOS ‘D’ during the AM peak hour and at an overall LOS ‘C’ during the PM peak hour. The intersection is anticipated to degrade to an

overall LOS 'D' for both the 20-year no-build and 20-year build conditions during the AM and PM peak hours. Signal timing and coordination adjustments are recommended to reduce individual approach delays for the 20-year build condition.

Elmwood Avenue @ Eastman Dental Driveway (393)

This newly signalized intersection (installed in 2008) operates at an overall LOS 'B' during the peak hours studied and is anticipated to continue to operate at an overall LOS 'B' or better for the 20-year no-build and 20-year build conditions.

Crittenden Boulevard @ East Drive (395)

This signalized intersection currently operates at an overall LOS 'B' during the peak hours studied and is anticipated to continue to operate at LOS 'B' or better for 20-year no-build and 20-year build conditions.

Monroe County Health Facility @ East Henrietta Road (470)

This signalized intersection currently operates at an overall LOS 'A' during the peak hours studied and is anticipated to continue to operate at an overall LOS 'D' or better for the 20-year no-build and Five Year build conditions during the AM and PM peak hours..

East Henrietta Road @ Crittenden Boulevard/MCC (500)

This intersection is signalized and currently operates at an overall LOS 'C' during the AM peak hour and a LOS 'D' during the PM peak hour. With the exception of the northbound left-turn lane during the AM peak hour and the eastbound left-turn lane during the PM peak hour, all movements operate at a LOS 'E' or better. With the 20-year no-build conditions, the intersection is anticipated to fail during the AM and PM peak hours. With minor signal timing modifications, the intersection is anticipated to improve in delay during the AM and PM peak hours.

West Henrietta Road @ Southland Drive (501)

This signalized intersection currently operates at an overall LOS 'A' during the peak hours studied and is anticipated to continue to operate at LOS 'A' for the 20-year no-build and build conditions.

East Henrietta Road @ Doncaster Road (502)

This signalized intersection currently operates at an overall LOS 'A' during the peak hours studied and is anticipated to continue to operate at LOS 'A' for the 20-year no-build and build conditions.

West Henrietta Road @ Crittenden Road (503)

This intersection is signalized and currently operates at an overall LOS 'C' during the AM peak hour and a LOS 'D' during the PM peak hour. The intersection is anticipated to degrade slightly to a LOS 'D' during the AM peak hour and to a LOS 'E' during the PM peak hour for the 20-year no-build and build conditions. The westbound approach and the southbound left-turn lane are projected to fail during the PM peak period for these scenarios. Additionally, with the 20-year build scenario, the southbound left turn movement is anticipated to fail during the AM peak hour. With minor signal timing modifications, the intersection is anticipated to operate at improved levels of service during the AM and PM peak hours.

West Henrietta Road @ Brighton Henrietta Town Line Road (504)

This intersection is signalized and currently operates at an overall LOS 'C' during the AM peak hour and a LOS 'D' during the PM peak hour. With the exception of the westbound left-turn lane that fails during the PM peak hour, all movements operate at a LOS 'E' or better. With the 20-year no-build and build conditions, the intersection is anticipated to continue to operate at current levels of service. However, with minor signal modifications the intersection delay is anticipated to improve.

East River Road & Crittenden Road (505)

All approaches for this unsignalized intersection currently operate at a LOS 'B' or better during the AM peak hour studied. The intersection is anticipated to continue to operate at acceptable levels of service for the 20-year no-build and build conditions during the peak hours analyzed.

East River Road & South Campus Site Drive #2 (506)

Identified in the University of Rochester's Master Plan, this unsignalized intersection is located on East River Road mid-block between the I-390 off ramp and West Henrietta Road. The intersection was not constructed during the time period the traffic volumes were collected and is therefore not included in the existing conditions. However, the intersection is included in the 20-year no-build scenario. With the exception of the northbound left-turn movement during the AM peak hour, all approaches are anticipated to operate at an overall LOS 'C' or better both AM and PM peak hours for this condition. For the 20-year build condition, the westbound approach is anticipated to fail during the AM peak hour. With the installation of a new actuated, coordinated two phase traffic signal, the intersection is anticipated to operate at an overall LOS 'B' during the AM and PM peak hour periods studied.

VIII. TRAFFIC SIGNAL WARRANT ANALYSIS

A traffic signal warrant study as described in the Manual on Uniform Traffic Control Devices for Streets and Highways, 2003 Edition was prepared by TYLI for the University of Rochester in July 2010. The study considered the prospective need for traffic signalization at the intersection of East Drive and Elmwood Avenue. The analysis was based on current traffic volumes and trips associated with new construction planned near East Drive within the near future (prior to the 5-year build scenario.) A letter of support from Monroe County Department of Transportation dated September 15, 2010 is included in **Appendix ‘E’**. The traffic signal was constructed in 2012 and is analyzed as an actuated-coordinated traffic signal for the 5-year and 20-year peak hour scenarios.

IX. ALTERNATIVE MODES OF TRANSPORTATION

Bus Service and Bus Stops

Regional Transit Service (RTS) operates commuter bus service within the study area. **Figure 17** (located in **Appendix ‘M’**) provides a summary of Bus Service available within the vicinity of the University of Rochester River Campus and Medical Center/Mid-Campus area.

RTS operates the following bus routes within the study area:

RTS Route No. 5 – The South Avenue route runs arrives from downtown via South Avenue turns onto Elmwood Avenue, turns onto either East Drive or Mt. Hope Avenue (schedule dependent), stopping at Strong Memorial Hospital. The route then runs east on Crittenden onto either Fort Hill or Mt. Hope Avenue. The scheduled travel time from Main Street and St Paul Street to Strong Hospital is 13 minutes.

RTS Route No. 8 – The Chili/Strong Route is a 25-minute bus service from Liberty Pole Way in downtown Rochester to Strong Memorial Hospital

RTS Route No. 12 – The 19th Ward/MCC Route operates on one-hour headways, only on weekdays. This route runs along Elmwood Avenue over the Genesee River, onto Kendrick Road, turning onto Crittenden Boulevard, and then it splits onto both Mt. Hope Avenue and East Henrietta Road.

RTS Route No. 18/19 – The University Route runs in two loops with the 18 Bus running clockwise and the 19 bus running in a counterclockwise direction between downtown Rochester, University Avenue, Brighton Twelve Corners and Strong Memorial Hospital. It

operates on 20 minute headways during the weekday and 45 minute headways on the weekends. The scheduled travel time from Main Street and Clinton Street to Strong Hospital is 33 minutes.

RTS Route No. 24 – Route 24 serves the Portland Avenue to Sea Breeze area, makes stops at the Medley Centre (Former Irondequoit Mall) but not directly on East Ridge Road.

RTS Route No. 50 – The MCC Route runs primarily along Mt. Hope Avenue from downtown Rochester stopping at Strong Memorial Hospital. The bus operates on 30 minute headway during most of the day on weekdays, but operates with shorter headways during the morning commuter peak period.

The University of Rochester also provides shuttle bus services for its employees and students. Schedule information is provided in **Appendix ‘M’**. The shuttle services are summarized in **Table 5**:

Table 5 - University of Rochester Bus and Shuttle Services

	Primary Destination	Service Frequency
Blue Line	South Campus	30 min. M-F 1 hr. avg. Sat/Sun
Red Line	Downtown/Eastman Living Center	60 min M-F 90 min Sat & Sun
Green Line	Shopping Areas	Weds, Sat & Sun Services Only
Silver Line	Park Lot – River Campus	15 min. M-F
HH/RPC	Highland Hospital/ Rochester Psychiatric Center	7-8 min. M-F
IOLA-Crittenden	IOLA	20 min. M-F
CVRI Shuttle	CVRI 601 Elmwood Ave	30 min. M-F
19 th Ward Shuttle	19 th Ward	40 min 5PM – 1AM, Mon, Tues, & Weds. 6PM-2AM, Thurs, Fri, Sat & Sun
Corporate Woods Shuttle	Corporate Woods	30 min. M-F

Source: Bus and Shuttle information obtained from University of Rochester Parking and Transportation Office website link is <http://www.rochester.edu/parking/shuttle.htm>

Sustainability Task Force Report

The University Council on Environmental Sustainability submitted a report to University President Joel Seligman on February 27, 2008⁵ outlining an implementation plan for 25 Task Force sustainability initiatives. Detailed transportation and parking recommendations are still under development that will address incentives for use of bus services and remote parking facilities. The purchase of hybrid vehicles for planned replacements in the security and parking fleets is being planned for fiscal year 2009. The following four Transportation and Parking initiatives were identified:

Provision of incentives for use of mass transit, carpooling, and alternative means of transportation. Among the tactics being explored are buy-back programs for parking permits,

⁵ University of Rochester, Report of the University Council on Environmental Sustainability, February, 27, 2008.

increasing financial incentives for car pooling permits, and free bus passes perhaps in combination with access to Zipcar usage. In addition, the University is collaborating with the Regional Transit System to develop “park and ride” routes based on the demographics of the University’s employee population. A plan for the installation of bicycle racks and safe storage areas is also being developed.

Pursuing use of existing remote parking facilities and minimize the paving of campus areas. To the extent that the University can acquire and make use of existing parking lots or properties easily adaptable to parking lots, the presence of automobiles on campus and the need to construct additional parking spaces can be minimized. This must be accompanied with attention to safety and convenient shuttle services. The University’s ability to provide such services has improved with the awarding of its shuttle bus contract to a firm specializing in campus transportation.

Strengthening of the University’s mortgage incentive program to encourage living close to campus. The University is now engaged in discussions with the City of Rochester and several local banks to develop a program of financial incentives for University employees to purchase homes in the Nineteenth Ward. This program will further the development of one of the neighborhoods adjacent to the University. This program in itself is not likely to significantly alter the demand for parking on campus, but it will highlight the benefits of living within walking distance of campus. Shuttle service from the Brooks Landing/Riverview areas to campus may also encourage Nineteenth Ward residents to leave their cars home.

Introduction of hybrid vehicles into the University’s fleet. The University will begin introducing hybrid vehicles into its fleet with the scheduled purchase of security patrol vehicles later in the year. Hybrid vehicles are particularly efficient at lower speeds and for short-distance driving, both characteristic of the vehicles used by the University. Hybrids will result in a decreased consumption of fuel and reduced emission of greenhouse gases.

Provide connectivity to the bicycle paths and trails between the U of R, Rochester Institute of Technology (RIT) and Monroe Community College (MCC). The 2012 Town of Brighton Comprehensive Pedestrian and Bicycle Master Plan included a recommendation to improve the trails between the three schools. The Town Trail is located along the entire length of the western boundary of the South Campus, where there are several existing trail connections. While the initial growth will likely occur along East River Road, opportunities for additional pedestrian and bicycle connectivity will be explored as future growth continues into the interior of the South Campus

Travel Demand Management

The analyses presented to-date has already identified the need for 695 off-site parking spaces at the Logan’s parking lot on Scottsville Road, and an additional 2,000 parking spaces off Campus. These parking spaces were needed primarily to minimize or mitigate traffic mitigation costs that otherwise would be needed elsewhere and at a considerably higher cost.

The current transit services being provided by RTS and by the University shows that public transportation is and will continue to play a vital role in the function of the University of Rochester Campus. While the vast majority of the University’s employee currently utilize private automobiles to commute to work, the long-term growth of the Campus from a parking and traffic congestion perspective suggests that the consideration of Travel Demand Management (TDM) strategies continue to be pursued and implemented by the University to help offset the long-range need for on-site parking and accordingly help offset additional traffic mitigation costs. Based on conceptual estimates prepared by Martin Alexiou and Bryson (MAB), with a 20 percent reduction of automobile demand (as a result of the implementation of TDM strategies), a parking reduction of 3,300 parking spaces could result.

Potential TDM measures as recommended by MAB are shown in **Table 6**:

Table 6 - Potential TDM Elements

Transit Incentives	✓	Neighborhood Commuter Shuttles
	•	U-pass (fare-free access to city transit for the University community)
Carpool / Vanpool Incentives	•	Free or cheaper permits for carpoolers / vanpoolers
	•	Preferential spaces for carpoolers/vanpoolers
	•	Free or subsidized van lease
	•	Ridematching
Cycling Incentives	✓	On-campus bicycle hire
	•	On-campus bicycle shop or servicing
Incentives for All Modes	✓	Guaranteed Ride Home
	•	Parking cash-out
	•	Cash incentive to try other modes
	•	Free occasional parking for non-permit-holders
Supporting Services	•	Prize draws or similar goodies
	✓	Campus shuttles to/from satellite locations
	✓	Shared cars (Zipcar)
	•	Departmental/shared bikes
	•	Evening door-to-door shuttle around campus
Remote Parking	•	Evening SafeRide/shuttle to nearby neighborhoods
	✓	Commuter park-and-ride
Flexible Permits	•	Secure remote storage for residents' cars
	✓	Evening permit
Management Tools	•	Pay-as-you go daily permit / scratchcard
	•	Parking cash-out
	•	TDM Co-ordinator
	•	Personalized travel planning

✓ = Existing program in place, can develop further

• = Additional elements to consider

Source: University of Rochester – Campus Master Plan Transportation Summary, Martin Alexiou Bryson, February, 11, 2008.

X. PEDESTRIAN ACCOMMODATIONS

The proposed development is subject to the NYSDOT Engineering Instruction (EI) 04-11 “Procedural Requirements for Pedestrian Accommodation”. The NYSDOT Pedestrian Generator Checklist aids in the determination of the need for pedestrian accommodations. Based upon the checklist provided in **Appendix ‘F’**, there is a need for additional pedestrian accommodations. Although existing pedestrian accommodations satisfy requirements, additional pedestrian clearance times should be added where appropriate and additional pedestrian accommodations are necessary at new and expanded intersections throughout the University.

XI. CONCLUSIONS AND RECOMENDATIONS

The proposed full build development is anticipated to generate a total of approximately 4,200 new vehicle trips during both the weekday morning and weekday evening peak hours. Each of the studied signalized intersections is anticipated to operate at a LOS equal to or better than the future background conditions for the 5-year and 20-year (build) conditions with the recommended improvements implemented.

5-year Plan

The following is a summary of recommended improvements to accommodate the proposed development for the 5-year build condition:

East River Road & Site Drive #2:

- Widening the service road from one lane to two lanes to accommodate the queues for the northbound approach.

Improved LOS with optimization of signal timings, phasing and/or coordination at:

- Elmwood Avenue & Kendrick Road,
- Elmwood Avenue & Eastman Dental Driveway
- Elmwood Avenue & East Drive
- Elmwood Avenue @ Mt. Hope Avenue,
- Crittenden Boulevard @ Kendrick Road,
- Crittenden Boulevard @ Mt. Hope Avenue,
- Westfall Road & Mt. Hope Avenue,
- Westfall Road @ East Henrietta Road,
- East River Road & West Henrietta Road
- East River Road & I-390 Off-Ramp
- East Henrietta Road & Crittenden Road

20-year Plan

In addition to the mitigation measures recommended above for the 5-year build condition, the following is a summary of recommended improvements to accommodate the proposed development for the 20-year build condition:

East River Road & Site Drive #2:

- Install a twp-phase coordinated traffic signal

Elmwood Avenue & Kendrick Road:

- Additional WB left-turn lane.

Westfall Road & Mt. Hope Avenue (15)

- Modify the existing 2-lane WB approach to 1 left-turn lane and a shared left-turn/through/right-turn lane.
- Split phase the eastbound and westbound movements.

The following lane configurations are recommended for the improvements proposed on East Henrietta Road by NYS DOT:

West Henrietta Road & East River Road:

- Southbound: 2-through lanes and an exclusive right turn lane.
- Westbound: 1-left turn lane, 2-through lanes and a shared through/right-turn lane.

Improved LOS with optimization of signal timings, phasing and/or coordination at:

- Elmwood Avenue & South Avenue,
- Elmwood Avenue & Kendrick Road,
- Elmwood Avenue @ Mt. Hope Avenue,
- Crittenden Boulevard @ Kendrick Road,
- Crittenden Boulevard @ Mt. Hope Avenue,
- Westfall Road & Mt. Hope Avenue,
- Westfall Road @ East Henrietta Road,
- East River Road & West Henrietta Road
- East River Road & I390 On-Ramp
- East Henrietta Road @ South Avenue
- East Henrietta Road & Iola Circle
- East Henrietta Road @ I-390 northbound on-ramp

- East Henrietta Road @ Stan Yale
- West Henrietta & Crittenden Road
- West Henrietta & Brighton Henrietta Town Line Road

Signalize traffic signals along Kendrick Road at the following intersections:

- Kendrick Road @ Alpha Road (proposed street),
- Kendrick Road @ Lattimore Avenue,
- Kendrick Road @ Westmoreland Avenue,

Revise pedestrian clearance times where appropriate.

With the above described mitigation measures in place in conjunction with improvements anticipated to be constructed by the NYSDOT and the improvements planned by the University, each of the intersections are projected to operate at current Levels of Service or better.

Although low levels of service and long delays are expected to continue during the peak hours studied at the intersections of Mount Hope Avenue with Elmwood Avenue and Crittenden Boulevard, both intersections are congested and experience long delays today. Due to geometrical constraints, widening the intersection to accommodate additional lanes is not feasible. However, over time drivers will adjust their routes and may utilize the Kendrick Road/I-390 interchange more so than predicted to avoid the traffic delays around the Mount Hope Avenue area.

To reduce congestion on campus, the University is currently utilizing positive TDM measures such as Zip Cars and periodic Shuttle Service. Though this is a positive step, additional TDM measures could be implemented to reduce the projected traffic volumes during peak hours.

Another way to reduce traffic volumes during the peak hours is to stagger employee shifts. This could be implemented in the Clinical buildings as employee densities are higher for this land use.

As the University continues to grow over the next 20-plus years, the phasing of development could control the rate at which the roadway network is impacted. The clinical type development has a higher employee density than research related development and generates approximately 67 percent more trips per square foot. As such, the University has committed (via City Ordinance) to update the Traffic Impact Study every five years. Additionally, the University will work with the

reviewing agencies during the site plan approval processes to ensure that the traffic improvements outlined in the TIS are on track as each project is presented for approval.

In an effort to minimize the impacts of growth on the area roadway network and the surrounding community, the University is committed to its sustainability initiatives and continuing its implementation of Travel Demand Management (TDM) measures (ride-share, staggered shift changes, transit use, shuttles, etc.) to minimize the impacts of growth on the adjacent roadway network and the surrounding community.

The recommendations proposed in this study in conjunction with the preferred I-390 alternative being progressed by NYSDOT will improve traffic flow and relieve congestion in the Routes 15/15A corridors. To obtain additional funding for the 1st phase of the project, the NYS DOT submitted a US DOT FHWA Tiger II Grant application in August of this year. The project name is: ***I-390 Southern Gateway Project at the University of Rochester and Monroe Community College: Linking Infrastructure, Education and Economic Growth.*** The Tiger Grant application was endorsed by the Town of Brighton.

The University Planned Development District #10 was approved by the City of Rochester in April 2010. Because specific projects and future growth plans are unknown beyond the 5-year timeframe, the PD #10 Ordinance approved by the City includes the following traffic impact study language in the review and approval section for future building projects: “ . . . ***the 2010 PD #10 Traffic Impact Study shall be updated or replaced every five years, commencing in 2015.***” Additionally, the University will continually work with the reviewing agencies in both the Town and the City during site plan approval processes for individual building applications to ensure that the anticipated traffic improvements outlined in this study are on track as the future growth of the University evolves.

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APPENDIX 'A'

Concept Site Plan

TY·LININTERNATIONAL

engineers | planners | scientists

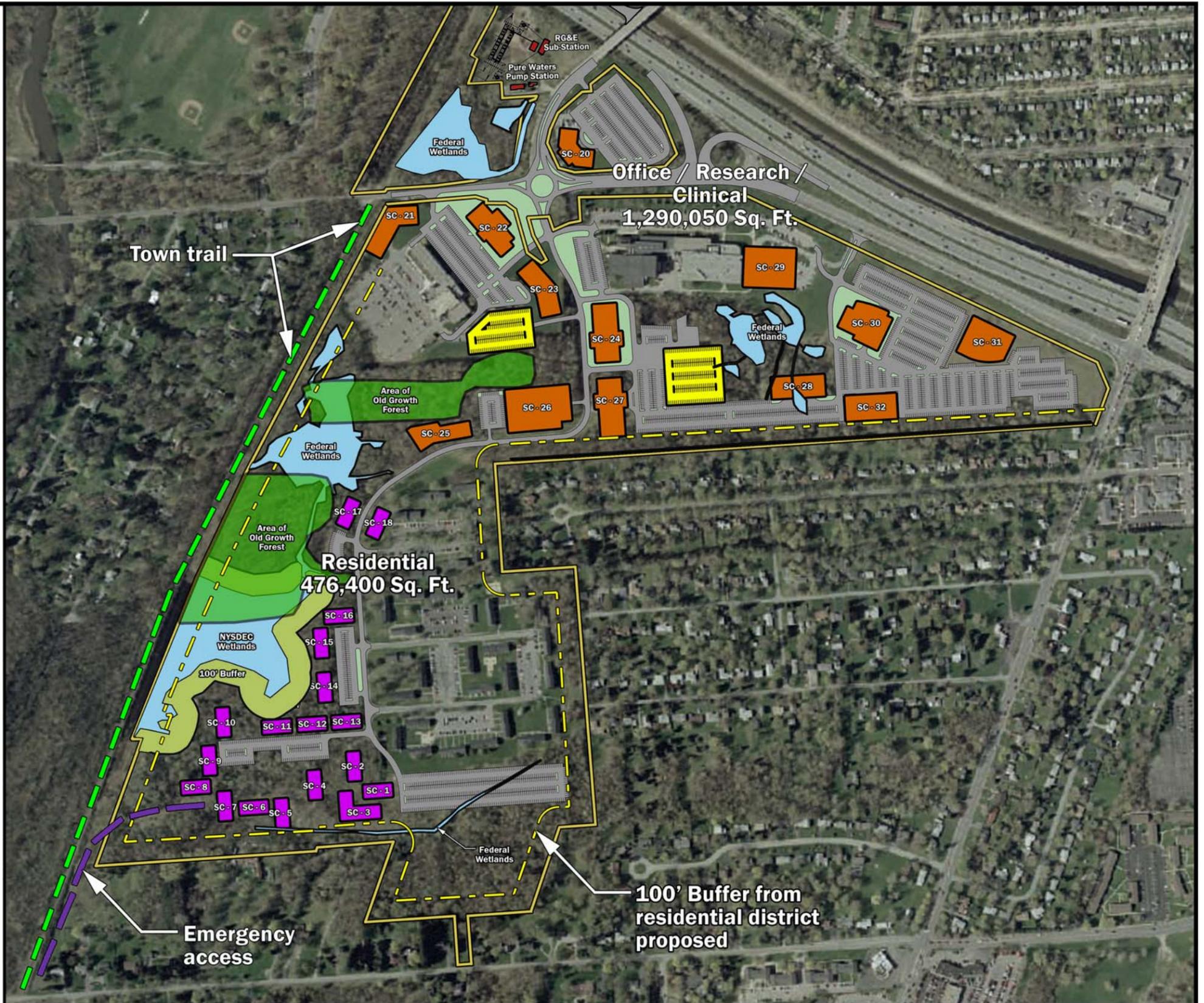
Residential: (4 floor buildings)

- SC-1: 24,000 gsf
- SC-2: 24,000 gsf
- SC-3: 46,400 gsf
- SC-4: 24,000gsf
- SC-5: 24,000 gsf
- SC-9: 24,000 gsf
- SC-7: 24,000 gsf
- SC-8: 24,000 gsf
- SC-9: 24,000 gsf
- SC-10: 46,000 gsf
- SC-11: 24,000 gsf
- SC-12: 24,000 gsf
- SC-13: 24,000 gsf
- SC-14: 24,000 gsf
- SC-15: 24,000 gsf
- SC-16: 24,000 gsf
- SC-18: 24,000 gsf
- SC-19: 24,000 gsf
- Subtotal: 476,400 gsf**

Office/Research/Clinical: (1-5 floor buildings)

- SC-20: 125,000 gsf
- SC-21: 100,000 gsf
- SC-22: 125,000 gsf
- SC-23: 100,000gsf
- SC-24: 100,000 gsf
- SC-25: 100,000 gsf
- SC-26: 100,000 gsf
- SC-27: 100,000 gsf
- SC-28: 100,000 gsf
- SC-29: 20,000 gsf
- SC-30: 140,050 gsf
- SC-31: 105,000 gsf
- SC-32: 75,000 gsf
- Subtotal: 1,290,050 gsf**

- Institutional Buildings (SC-20 - SC-32)
- Parking Structures (multi level)
- Residential Buildings (SC-1 - SC-18)



UNIVERSITY OF ROCHESTER SOUTH CAMPUS

Master Plan with Building Square Footages

APPENDIX 'B'

Trip Generation Calculations & Trip Generation Summary sheets

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Ta B-1
University of Rochester
Planned BLDG Model Traffic Forecast
(0-5) Year Plan

Development	Units	ITE Land Use Code	AM Trip Rate	PM Trip Rate	Morning Peak Hour		Evening Peak Hour		
					Enter	Exit	Enter	Exit	
Warner School	86 employees	550	0	0.88	0	0	22	54	76
Col. Twn. w Credit	100%								
CTSB	761 employees	610	*Varies	0.33	54	109	183	160	343
Prism	1663 employees	610	0.34	0.33	181	78	90	161	251
Total (0-5)					631	356	493	726	1219
<i>Total mid-campus</i>					577	247	824	566	876

Per Master Plan Parking Forecasts 1/08/08 version	Empls/ 1000 GSF	employees	Request permit	% present at once	Visitor Pkgng Adj Factor	# of parking spaces
CTSB	1.977	761	89.80%	54.80%	1.0	374
Prism Building	3.3	1663	89.80%	54.80%	1.0	818
CTSB	385	KSF *	761	employees		
Prism Building	504	KSF *	1663	employees		
Warner School	70	KSF *	86	employees	0.570	49



Tab B-2
University of Rochester
College Town Trip Generation
Full Build Plan

Use	#Floors	GSF	AM Rate	PM Rate	Morning Peak Hour		Evening Peak Hour		
					Enter	Exit	Enter	Exit	
Total Retail (Shopping Center-LUC 820)		80,000	1.03	3.75	50	32	144	156	300
Residential (Residential Apartments-LUC 220)		240	0.51	0.62	24	98	97	52	149
Administrative (General Office Building-LUC 710)		150,000	1.55	1.49	205	28	38	186	224
Sub-Total		230,240			279	158	279	394	673
Total Credit (Peak Hour Traffic Projections)				See note	225	49	96	234	330
Total					54	109	183	160	343

Ta B-3
University of Rochester
College Town Credit (0-5+)

Development	Units	ITE Land Use Code	Daily Rate	AM Trip Rate	PM Trip Rate	Daily Total	Morning Peak Hour		Evening Peak Hour			
							Enter	Exit	Enter	Exit	Total	Total
Brooks Landing	135 employees	550	9.13	0.73	0.88	1233	81	18	35	84	119	
Security	80 employees	550	9.13	0.73	0.88	730	48	10	20	50	70	
TownHouses	60 employees	550	9.13	0.73	0.88	548	36	8	15	38	53	
Mt Hope Prof.	100 employees	550	9.13	0.73	0.88	913	60	13	26	62	88	
Total Credit (Peak Hour Traffic Projections)							3424	225	49	96	234	330

University/College	375	550		0.73	0.88		225	49	274	96	234	330
Med/Dental office	60	720		0.53	1.06		25	7	32	22	42	64
Clinic	60	630		1.23	3.78		30	44	74	93	134	227

Clinic 1000sf Rate = 31.45 w/ 50/50 split

Per Master Plan Parking Forecasts	Empls/ 1000 GSF	employees	Request permit	% present at once	Pkng Adj Factor	Visitor # of parking spaces
1/08/08 version						
Brooks Landing		135	89.80%	54.80%	1.0	66
Security		80	89.80%	54.80%	1.0	39
TownHouses		60	89.80%	54.80%	1.0	30
Mt Hope Prof.		225	89.80%	54.80%	1.0	111



Trip Generation Calculations

130,000 SF Medical Office Buildings

Medical-Dental Office Building (LUC 720)

Weekday AM

T=	2.39	(	X	)	+	0
T=	2.39	(	130	)	+	0
T=	311 Trips					CHECK
	entering =	79%	245.69			246
	exiting =	21%	65.31			65
			311			OK

Weekday PM

LN(T) =	0.90 LN	(	X	)	+	1.53
LN(T) =	0.90 LN	(	130	)	+	1.53
T=	369 Trips					CHECK
	entering =	28%	103.32			103
	exiting =	72%	265.68			266
			369			OK

Summary

Medical Dental Office	<u>AM Peak Hour</u>			<u>PM Peak Hour</u>		
	<u>Enter</u>	<u>Exit</u>	<u>Total</u>	<u>Enter</u>	<u>Exit</u>	<u>Total</u>
	246	65	311	103	266	369

ITE Trip Generation, 9th edition

**Trip Generation Estimate
for Full Buildout of
University of Rochester Mid-Campus Master Plan**

Land Use	*GSF	Employee/ KSF	Number of Employees	Source of Employer/KSF projection
Total Academic GSF	1,018,580	1.228	1251	Sheet 4c, section C - MAB Parking Forecast
Total Residential GSF	565,540	0	0	
Total Research GSF	1,410,080	1.977	2788	Sheet 4b, Section A Parking Forecast
Total Clinical GSF	708,940	3.3	2340	Sheet 4b, Section A Parking Forecast
Total CTSB GSF	512,910	1.977	1014	Sheet 4b, Section A Parking Forecast
Proposed New Medical	1,300,000	2.541	3303	Sheet 4b, Section A Parking Forecast
Mount Hope Development	470,000		0	
Total	5,986,050		10696	=X

TOTAL PEAK HOUR VEHICLE TRIPS

AM Peak Hour	Enter	Exit	Total	
Ln(T) = 0.64Ln(X) +2.08	2488	546	3034	ITE Land Use Code 550, University/College
PM Peak Hour				
Ln(T) = 0.52Ln(X) +3.12	818	2002	2820	ITE Land Use Code 550, University/College

Calc of Additional Trips (per 100K GSF of Different Uses)

Research GSF	100,000	1.977	198	Sheet 4b, Section A Parking Forecast
Clinical GSF	100,000	3.3	330	Sheet 4b, Section A Parking Forecast
CTSB GSF	100,000	1.977	198	Sheet 4b, Section A Parking Forecast

Total Research X= 198
Total Clinical X= 330

TOTAL PEAK HOUR VEHICLE TRIPS (per 100K)

Research (X=198)

AM Peak Hour	Enter	Exit	Total	
Ln(T) = 0.64Ln(X) +2.08	194	42	236	ITE Land Use Code 550, University/College
PM Peak Hour				
Ln(T) = 0.52Ln(X) +3.12	103	251	354	ITE Land Use Code 550, University/College

Clinical (X=330)

AM Peak Hour	Enter	Exit	Total	
Ln(T) = 0.64Ln(X) +2.08	268	59	327	ITE Land Use Code 550, University/College
PM Peak Hour				
Ln(T) = 0.52Ln(X) +3.12	134	328	462	ITE Land Use Code 550, University/College



Brighton IPD trip Generation Comparison Summary

	AM		PM	
	Enter	Exit	Enter	Exit
Student housing	40	160	155	83
-10%	<u>4</u>	<u>16</u>	<u>15.5</u>	<u>8.3</u>
Total Res	36	144	139.5	74.7
SC Developmet 1,290,050 SF	<u>626</u>	<u>187</u>	<u>194</u>	<u>580</u>
subtotal	662	331	333.5	654.7
volume to SC in 2010 TIS	<u>500</u>	<u>137</u>	<u>205</u>	<u>379</u>
Net new trips to SC	162	194	128.5	275.7

Trip Generation Calculations

400 Apartment Units

Apartment (LUC 220)

Weekday AM

T=	0.49	(	X	)	+	3.73	
T=	0.49	(	400	)	+	3.73	
T=	200 Trips						CHECK
	entering =	20%				40.00	40
	exiting =	80%				160.00	160
						200	OK

Weekday PM

T=	0.55	(	X	)	+	17.65	
T=	0.55	(	400	)	+	17.65	
T=	238 Trips						CHECK
	entering =	65%				154.70	155
	exiting =	35%				83.30	83
						238	OK

Saturday MIDDAY

T=	0.41 *	(	X	)	+	19.23	
T=	0.41 *	(	400	)	+	19.23	
T=	183 Trips						CHECK
	entering =	50%				91.50	92
	exiting =	50%				91.50	91
						183	OK

Sunday MIDDAY

T=	0.51 *	(	X)	+		
T=	0.51 *	(	400	)	+	0.00	
T=	204 Trips						CHECK
	entering =	50%				102.00	102
	exiting =	50%				102.00	102
						204	OK

With 1,200 beds total
Assumed :
150 – 2 Bed Units = 300
100 – 3 Bed Units = 300
150 – 4 Bed Units = 600
400 Units Total = 1200 beds

<u>Summary</u>												
Residential Apartment	<u>AM Peak Hour</u>			<u>PM Peak Hour</u>			<u>SAT Peak Hour</u>			<u>SUN Peak Hour</u>		
	<u>Enter</u>	<u>Exit</u>	<u>Total</u>	<u>Enter</u>	<u>Exit</u>	<u>Total</u>	<u>Enter</u>	<u>Exit</u>	<u>Total</u>	<u>Enter</u>	<u>Exit</u>	<u>Total</u>
	40	160	200	155	83	238	92	91	183	102	102	204

ITE Trip Generation, 9th edition

BY CAB	DATE 6/12/13	CHECKED	DATE
PROJECT #	PROJECT NAME Brighton IPD.	SHEET 1	OF 1

CALCS FOR SOUTH CAMPUS (Full Build)

1,290 KSF OFFICE/RESEARCH/CLINICAL

ITE 9th Edition
LUC Hospital. 610.
(Specialized Land Use)

AM Peak $1,290 \text{ KSF} \times 0.63 = 813$ w 77% in / 23% out.
 $\approx 626 \text{ in} / 187 \text{ out.}$

PM Peak $1,290 \text{ KSF} \times 0.60 = 774$ w 25% in / 75% out.
194 in / 580 out.

Residential = 476,400 SF

≈ 400 units.

(Calcs on separate sheet.)

APPENDIX 'C'

Level of Service Table & Level of Service Definitions

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DEFINITIONS OF LEVEL OF SERVICE FOR TWSC UNSIGNALIZED INTERSECTIONS

<u>Level of Service</u>	<u>Average Control Delay (S/Veh)</u>
A	0 -10.0
B	>10.0 -15.0
C	>15.0 - 25.0
D	>25.0 - 35.0
E	>35.0 - 50.0
F	>50.0

Level of Service for two-way stopped-control unsignalized intersections describes the quality of traffic operation in terms of average control delay. LOS is defined for each minor movement, not for the intersection as a whole. Levels range from A to F, with A describing traffic operations with little or no delays. Level of Service analysis for TWSC unsignalized intersections considers the left-turn out of the minor road, the right-turn out of the minor road, and the left-turn entering the minor road. The average control delay is defined as the total elapsed time from when a vehicle stops at the end of a queue until the vehicle departs from the stop line. This includes the time required for the vehicle to travel from the "last-in-queue" position to the "first-in-queue" position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

Average control delay for any particular minor movement is a function of the capacity of the approach and the degree of saturation. Because different transportation facilities cause different driver perceptions, the LOS criteria for TWSC intersections are different from the criteria for signalized intersections.

DEFINITIONS OF LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS

Level of Service describes the quality of operation in terms of delay to the driving public. Levels range from A to F describing traffic operation with very little delay. Definitions for levels of Service follow. The Level of Service analysis provides a basis for assessing the potential impact of traffic; both in terms of how traffic conditions would change and whether the existing transportation system would be adequate for the additional traffic.

Level of Service for signalized intersections is defined in terms of control delay. Control delay is a component of delay that results when a control signal causes a lane group to reduce speed or stop. It is measured by comparison with the uncontrolled condition. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

Specifically, level-of-service criteria are stated in terms of control delay per vehicle for a 15-minute analysis period. The criteria are given in the following table:

<u>Level of Service</u>	<u>Stopped Delay Per Vehicle (seconds)</u>
A	0 - 10.0
B	>10.0 - 20.0
C	>20.0 - 35.0
D	>35.0 - 55.0
E	>55.0 - 80.0
F	>80.0

Control delay is a complex measure and is dependent on a number of variables including: the quality of traffic progression, the cycle length, and the relative amount of green time for the lane group or approach in question.

Level-of-Service A describes operations with very low control delay, i.e., less than 10.0 seconds per vehicle. This occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

Level-of-Service B describes operations with control delay in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level A, causing higher levels of average delay.

Level-of-Service C describes vehicles with control delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

Level-of-Service D describes operations with control delay in the range of 35.1 to 55.0 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression or long cycle lengths. Many vehicles stop and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

Level-of-Service E describes operations with control delay in the range of 55.1 to 80.0 per vehicle. This is considered the limit of acceptable delay. These high delay values generally indicate poor progression and long cycle lengths. Individual cycle failures are frequent occurrences.

Level-of-Service F describes operations with control delay in excess of 80.0 seconds per vehicle. This is considered unacceptable by most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

APPENDIX 'D'

Intersection Capacity Analysis Printouts

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AM Peak Hour

Existing Conditions

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Timings
1: East River Road & Kendrick



Lane Group	EBL	EBT	WBT	SBL
Lane Configurations		↔↑	↔↑	↔↔
Volume (vph)	167	136	160	104
Turn Type	Perm			
Protected Phases		2	2	4
Permitted Phases	2			
Detector Phase	2	2	2	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	6.0
Minimum Split (s)	26.0	26.0	26.0	12.0
Total Split (s)	91.0	91.0	91.0	29.0
Total Split (%)	75.8%	75.8%	75.8%	24.2%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Min	Min	Min	None
Act Effct Green (s)		23.8	23.8	11.0
Actuated g/C Ratio		0.58	0.58	0.27
v/c Ratio		0.28	0.41	0.20
Control Delay		5.1	1.6	8.7
Queue Delay		0.0	0.0	0.0
Total Delay		5.1	1.6	8.7
LOS		A	A	A
Approach Delay		5.1	1.6	8.7
Approach LOS		A	A	A

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 40.9
 Natural Cycle: 40
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.41
 Intersection Signal Delay: 3.4
 Intersection Capacity Utilization 48.4%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: East River Road & Kendrick



Timings
2: East River Road & I-390 Off Ramp



Lane Group	EBT	WBT	SBL	SBR
Lane Configurations	↑↑	↑↑	↘↘	↘
Volume (vph)	240	439	982	332
Turn Type				Perm
Protected Phases	4	8	6	
Permitted Phases				6
Detector Phase	4	8	6	6
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0
Total Split (s)	33.0	33.0	57.0	57.0
Total Split (%)	36.7%	36.7%	63.3%	63.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	15.0	15.0	27.3	27.3
Actuated g/C Ratio	0.31	0.31	0.56	0.56
v/c Ratio	0.24	0.45	0.57	0.38
Control Delay	14.7	16.2	8.3	4.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.7	16.2	8.3	4.7
LOS	B	B	A	A
Approach Delay	14.7	16.2	7.4	
Approach LOS	B	B	A	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 48.6
 Natural Cycle: 50
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 10.2
 Intersection Capacity Utilization 46.8%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: East River Road & I-390 Off Ramp



Timings
5: I-390 NB On-Ramp & West Henrietta Road

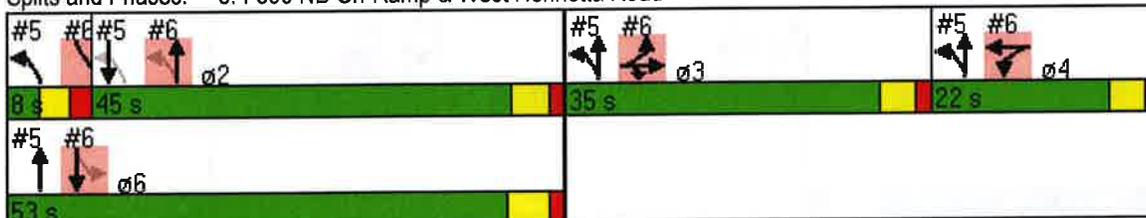


Lane Group	NBL	NBT	SBT	ø1	ø3	ø4	ø6
Lane Configurations	↶	↑↑	↑↑↑				
Volume (vph)	307	1164	701				
Turn Type	D,P+P						
Protected Phases	1 3 4	3 4 6	2	1	3	4	6
Permitted Phases	2						
Detector Phase	1 3 4	3 4 6	2				
Switch Phase							
Minimum Initial (s)			3.0	3.0	3.0	3.0	3.0
Minimum Split (s)			29.0	8.0	25.0	15.0	25.5
Total Split (s)	65.0	110.0	45.0	8.0	35.0	22.0	53.0
Total Split (%)	59.1%	100.0%	40.9%	7%	32%	20%	48%
Yellow Time (s)			3.5	3.0	3.5	3.5	4.0
All-Red Time (s)			1.5	2.0	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0				
Total Lost Time (s)	3.0	3.0	3.0				
Lead/Lag			Lag	Lead	Lead	Lag	
Lead-Lag Optimize?							
Recall Mode			C-Max	None	None	None	C-Max
Act Effct Green (s)	104.0	110.0	42.0				
Actuated g/C Ratio	0.95	1.00	0.38				
v/c Ratio	0.30	0.37	0.48				
Control Delay	9.6	0.6	9.1				
Queue Delay	0.0	0.0	0.0				
Total Delay	9.6	0.6	9.1				
LOS	A	A	A				
Approach Delay		2.5	9.1				
Approach LOS		A	A				

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 4.9
 Intersection Capacity Utilization 40.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 5: I-390 NB On-Ramp & West Henrietta Road



Timings

6: East River Road & West Henrietta Road

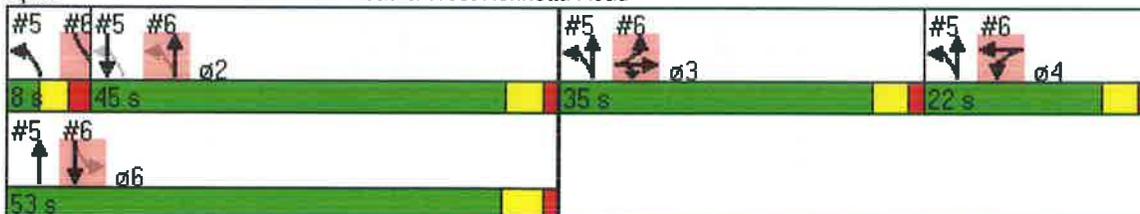


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	438	68	716	100	300	118	892	52	628
Turn Type	Split		Prot	Split		Perm		pm+pt	
Protected Phases	3	3	3	4	4		2	1	6
Permitted Phases						2		6	
Detector Phase	3	3	3	4	4	2	2	1	6
Switch Phase									
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	15.0	15.0	29.0	29.0	8.0	25.5
Total Split (s)	35.0	35.0	35.0	22.0	22.0	45.0	45.0	8.0	53.0
Total Split (%)	31.8%	31.8%	31.8%	20.0%	20.0%	40.9%	40.9%	7.3%	48.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.0	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	32.0	32.0	32.0	19.0	19.0	42.0	42.0	50.0	50.0
Actuated g/C Ratio	0.29	0.29	0.29	0.17	0.17	0.38	0.38	0.45	0.45
v/c Ratio	0.72	0.62	0.68	0.36	0.78	0.56	0.55	0.30	0.45
Control Delay	44.9	23.3	19.6	44.1	47.3	41.8	31.5	11.5	4.4
Queue Delay	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.9	23.3	19.9	44.1	47.3	41.8	31.5	11.5	4.4
LOS	D	C	B	D	D	D	C	B	A
Approach Delay		27.7			46.7		32.6		4.9
Approach LOS		C			D		C		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 27.6
 Intersection Capacity Utilization 70.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 6: East River Road & West Henrietta Road



Timings
7: I-390 NB & E Henrietta

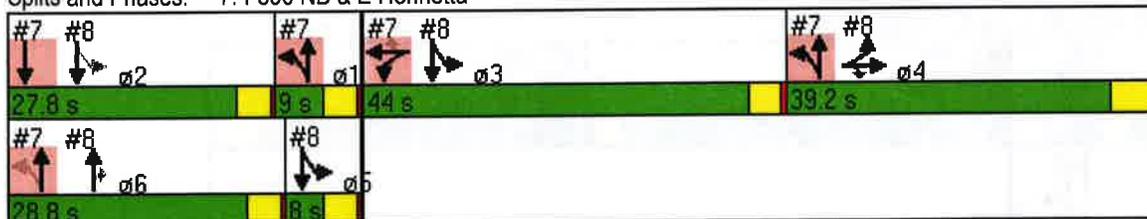


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	ø1	ø4	ø5	ø6
Lane Configurations	↙	↔	↘	↙	↕	↕	↘				
Volume (vph)	556	542	853	206	1004	888	75				
Turn Type	Split		Perm	pm+pt			Free				
Protected Phases	3	3		14	1 4 6	2		1	4	5	6
Permitted Phases			3	1 4 6			Free				
Detector Phase	3	3	3	14	1 4 6	2					
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0			4.0		3.0	3.0	3.0	4.0
Minimum Split (s)	20.0	20.0	20.0			20.0		8.0	25.5	8.0	20.0
Total Split (s)	44.0	44.0	44.0	48.2	77.0	27.8	0.0	9.0	39.2	8.0	28.8
Total Split (%)	36.7%	36.7%	36.7%	40.2%	64.2%	23.2%	0.0%	8%	33%	7%	24%
Yellow Time (s)	3.5	3.5	3.5			3.5		3.5	5.0	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5			0.5		0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0				
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Lead/Lag	Lead	Lead	Lead			Lead		Lag	Lag	Lag	Lead
Lead-Lag Optimize?											
Recall Mode	None	None	None			C-Max		None	None	Min	C-Max
Act Effct Green (s)	41.0	41.0	41.0	68.0	71.0	24.8	120.0				
Actuated g/C Ratio	0.34	0.34	0.34	0.57	0.59	0.21	1.00				
v/c Ratio	1.01	1.02	0.91	0.33	0.53	0.94	0.05				
Control Delay	80.9	69.5	53.5	13.1	2.9	79.1	0.1				
Queue Delay	0.0	0.3	0.0	1.4	0.7	1.4	0.0				
Total Delay	80.9	69.8	53.5	14.5	3.5	80.5	0.1				
LOS	F	E	D	B	A	F	A				
Approach Delay		68.9			5.4	74.2					
Approach LOS		E			A	E					

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 51.5
 Intersection LOS: D
 Intersection Capacity Utilization 108.6%
 ICU Level of Service G
 Analysis Period (min) 15
 Description: Counts from NYSDOT 3/17/2005

Splits and Phases: 7: I-390 NB & E Henrietta



Timings
8: I-390 SB Ramp & E Henrietta

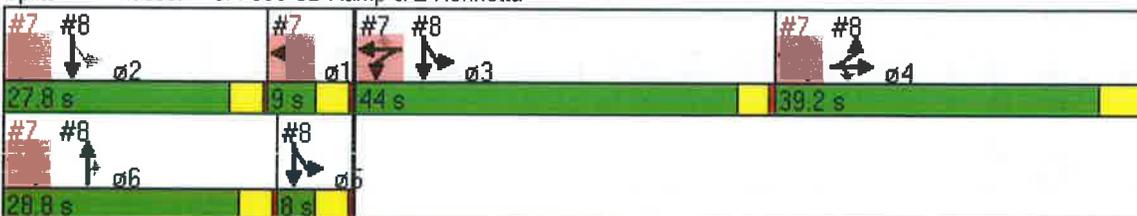
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								ø1	ø2	ø3	ø5
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT				
Lane Configurations											
Volume (vph)	428	133	886	782	211	208	1236				
Turn Type	Split		Perm		Perm	pm+pt					
Protected Phases	4	4		6		3 5	2 3 5	1	2	3	5
Permitted Phases			4		6	2 3 5					
Detector Phase	4	4	4	6	6	3 5	2 3 5				
Switch Phase											
Minimum Initial (s)	3.0	3.0	3.0	4.0	4.0			3.0	4.0	4.0	3.0
Minimum Split (s)	25.5	25.5	25.5	20.0	20.0			8.0	20.0	20.0	8.0
Total Split (s)	39.2	39.2	39.2	28.8	28.8	52.0	79.8	9.0	27.8	44.0	8.0
Total Split (%)	32.7%	32.7%	32.7%	24.0%	24.0%	43.3%	66.5%	8%	23%	37%	7%
Yellow Time (s)	5.0	5.0	5.0	3.5	3.5			3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5			0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-1.0	-1.0	-1.0	-1.0				
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Lead/Lag	Lag	Lag	Lag	Lead	Lead			Lag	Lead	Lead	Lag
Lead-Lag Optimize?											
Recall Mode	None	None	None	C-Max	C-Max			None	C-Max	None	Min
Act Effct Green (s)	36.2	36.2	36.2	25.8	25.8	73.8	73.8				
Actuated g/C Ratio	0.30	0.30	0.30	0.22	0.22	0.62	0.62				
v/c Ratio	0.80	1.04dr	1.04	0.80	0.45	0.29	0.63				
Control Delay	52.6	43.7	89.1	51.7	10.5	8.1	4.7				
Queue Delay	0.0	6.1	168.6	0.0	0.0	0.1	2.4				
Total Delay	52.6	49.8	257.6	51.7	10.5	8.2	7.1				
LOS	D	D	F	D	B	A	A				
Approach Delay		114.1		43.0			7.3				
Approach LOS		F		D			A				

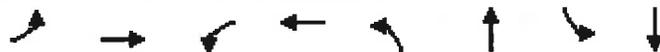
Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 56.2
 Intersection Capacity Utilization 108.6%
 Analysis Period (min) 15
 Description: Counts from NSDOT 3/22/05
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: I-390 SB Ramp & E Henrietta



Timings
10: Westfall & E Henrietta



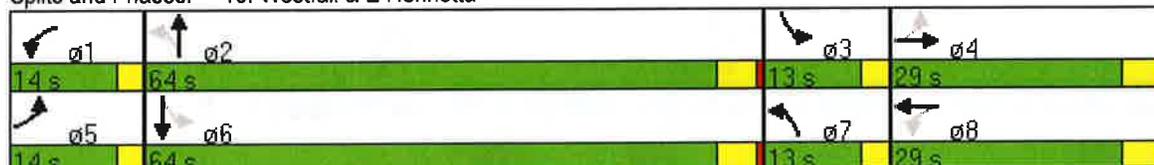
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	85	280	203	265	191	1010	150	772
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	5	4	1	8	7	2	3	6
Permitted Phases	4		8		2		6	
Detector Phase	5	4	1	8	7	2	3	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	7.0	5.0	7.0
Minimum Split (s)	10.0	29.0	10.0	29.0	10.0	30.0	10.0	30.0
Total Split (s)	14.0	29.0	14.0	29.0	13.0	64.0	13.0	64.0
Total Split (%)	11.7%	24.2%	11.7%	24.2%	10.8%	53.3%	10.8%	53.3%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0	-2.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	32.4	21.8	32.4	21.8	75.6	66.5	75.6	66.5
Actuated g/C Ratio	0.27	0.18	0.27	0.18	0.63	0.55	0.63	0.55
v/c Ratio	0.42	0.59	0.90	0.68	0.60	0.84	0.84	0.50
Control Delay	45.6	46.1	81.2	42.2	21.0	29.1	87.0	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0
Total Delay	45.6	46.1	81.2	42.2	21.0	29.9	87.0	25.9
LOS	D	D	F	D	C	C	F	C
Approach Delay		46.0		55.0		28.8		34.8
Approach LOS		D		E		C		C

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 36.8
 Intersection Capacity Utilization 84.2%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 10: Westfall & E Henrietta



Timings
11: South & E Henrietta

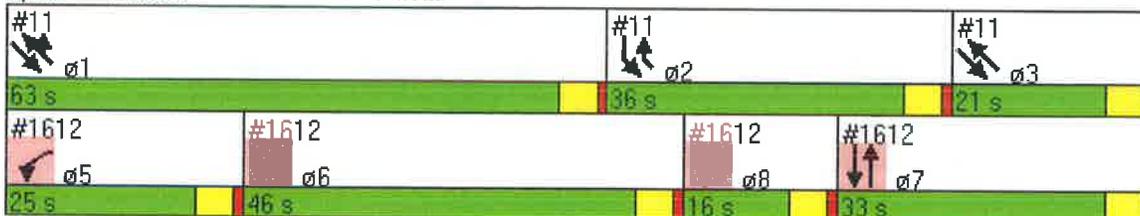
Lane Group	SBL	SET	NWT	NWR	ø1	ø3	ø5	ø6	ø7	ø8
Lane Configurations	↘↘	↑↑	↑	↗						
Volume (vph)	498	386	704	580						
Turn Type				custom						
Protected Phases	2	13	13	12	1	3	5	6	7	8
Permitted Phases		13		1						
Detector Phase	2	13	13	12						
Switch Phase										
Minimum Initial (s)	10.0				24.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	21.0	33.0	33.0	13.0
Total Split (s)	36.0	84.0	84.0	99.0	63.0	21.0	25.0	46.0	33.0	16.0
Total Split (%)	30.0%	70.0%	70.0%	82.5%	53%	18%	21%	38%	28%	13%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0						
Total Lost Time (s)	3.0	3.0	3.0	3.0						
Lead/Lag	Lag				Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None				C-Max	None	C-Max	None	None	None
Act Effct Green (s)	29.0	85.0	85.0	93.1						
Actuated g/C Ratio	0.24	0.71	0.71	0.78						
v/c Ratio	0.67	0.18	0.59	0.47						
Control Delay	42.8	6.5	8.4	0.9						
Queue Delay	7.0	0.0	0.2	0.1						
Total Delay	49.8	6.5	8.6	1.0						
LOS	D	A	A	A						
Approach Delay	49.8	6.5	5.2							
Approach LOS	D	A	A							

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 1: NWSE and 5:, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 15.7
 Intersection Capacity Utilization 57.9%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 11: South & E Henrietta



Timings
12: Crittenden Blvd & Mt. Hope

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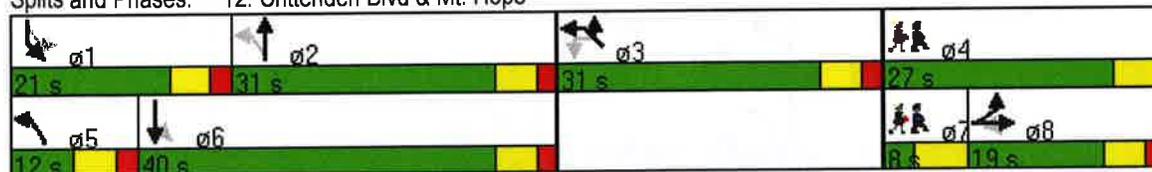


Lane Group	EBL	EBT	EBR	NBL	NBT	SBL2	SBL	SBT	NWL	NWR	ø4	ø7
Lane Configurations												
Volume (vph)	99	1	151	119	532	2	273	682	296	278		
Turn Type	Split		Perm	pm+pt		custom	pm+pt			Prot		
Protected Phases	8	8		5	2		1	6	3	3	4	7
Permitted Phases			8	2		1	6					
Detector Phase	8	8	8	5	2	1	1	6	3	3		
Switch Phase												
Minimum Initial (s)	13.0	13.0	13.0	5.0	7.0	5.0	5.0	7.0	6.0	6.0	1.0	3.0
Minimum Split (s)	19.0	19.0	19.0	12.0	27.0	12.0	12.0	27.0	18.0	18.0	25.0	8.0
Total Split (s)	19.0	19.0	19.0	12.0	31.0	21.0	21.0	40.0	31.0	31.0	27.0	8.0
Total Split (%)	17.3%	17.3%	17.3%	10.9%	28.2%	19.1%	19.1%	36.4%	28.2%	28.2%	25%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lead	Lag				Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	C-Max	None	None	C-Max	None	None	None	None
Act Effct Green (s)	19.2	19.2	19.2	44.9	33.9		55.3	41.3	26.5	26.5		
Actuated g/C Ratio	0.17	0.17	0.17	0.41	0.31		0.50	0.38	0.24	0.24		
v/c Ratio	0.34	0.54	0.52	0.51	0.55		0.69	0.76	0.77	0.82		
Control Delay	42.3	48.9	48.0	21.6	34.6		33.7	47.5	51.7	58.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total Delay	42.3	48.9	48.0	21.6	34.6		33.7	47.5	51.7	58.0		
LOS	D	D	D	C	C		C	D	D	E		
Approach Delay		46.8			32.3			44.2	54.8			
Approach LOS		D			C			D	D			

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 43.9
 Intersection Capacity Utilization 72.4%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service C

Splits and Phases: 12: Crittenden Blvd & Mt. Hope



Timings
13: Elmwood Ave & Mt. Hope

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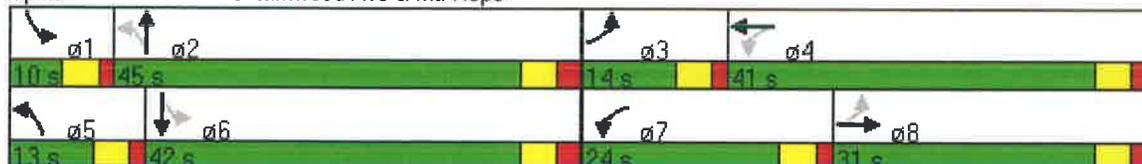


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	↑↓	←	↑↓	←	↑↓	←	↑↓
Volume (vph)	160	548	329	851	177	600	38	659
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	3	8	7	4	5	2	1	6
Permitted Phases	8		4		2		6	
Detector Phase	3	8	7	4	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	10.0	4.0	10.0	4.0	7.0	4.0	7.0
Minimum Split (s)	12.0	31.0	12.0	31.0	10.0	32.0	10.0	32.0
Total Split (s)	14.0	31.0	24.0	41.0	13.0	45.0	10.0	42.0
Total Split (%)	12.7%	28.2%	21.8%	37.3%	11.8%	40.9%	9.1%	38.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	38.9	28.1	51.7	37.9	52.3	46.3	46.0	39.1
Actuated g/C Ratio	0.35	0.26	0.47	0.34	0.48	0.42	0.42	0.36
v/c Ratio	0.73	0.89	0.92	0.79	0.84	0.56	0.16	0.87
Control Delay	41.3	50.5	56.9	38.0	66.4	26.4	17.3	39.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	50.5	56.9	38.0	66.4	26.4	17.3	39.2
LOS	D	D	E	D	E	C	B	D
Approach Delay		48.9		43.2		34.2		38.4
Approach LOS		D		D		C		D

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 41.2
 Intersection Capacity Utilization 90.2%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 13: Elmwood Ave & Mt. Hope



Timings
14: Lattimore & Mt. Hope

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Lane Group	EBL	NBL	NBT	SBT
Lane Configurations	Y		↑↑	↑↑
Volume (vph)	9	123	651	692
Turn Type	Perm			
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	26.0	24.0	24.0	24.0
Total Split (s)	27.0	83.0	83.0	83.0
Total Split (%)	24.5%	75.5%	75.5%	75.5%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effect Green (s)	8.9		100.7	100.7
Actuated g/C Ratio	0.08		0.92	0.92
v/c Ratio	0.23		0.39	0.27
Control Delay	25.8		1.9	0.3
Queue Delay	0.0		0.0	0.0
Total Delay	25.8		1.9	0.3
LOS	C		A	A
Approach Delay	25.8		1.9	0.3
Approach LOS	C		A	A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 1.6
 Intersection Capacity Utilization 58.0%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 14: Lattimore & Mt. Hope



Timings
15: Westfall & Mt. Hope



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↗	↖	↗	↖	↕	↗	↖	↕
Volume (vph)	9	112	53	158	205	84	682	398	92	619
Turn Type	Perm		custom	pm+pt		pm+pt		Perm	pm+pt	
Protected Phases		4	4	3	3 4	2	1		2	1
Permitted Phases	4		4	3 4		1		1	1	
Detector Phase	4	4	4	3	3 4	2	1	1	2	1
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	5.0		5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	29.0	29.0	29.0	11.0		13.0	40.0	40.0	13.0	40.0
Total Split (s)	30.0	30.0	30.0	18.0	48.0	13.0	49.0	49.0	13.0	49.0
Total Split (%)	27.3%	27.3%	27.3%	16.4%	43.6%	11.8%	44.5%	44.5%	11.8%	44.5%
Yellow Time (s)	4.0	4.0	4.0	3.0		3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	1.0	2.0		2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	None	None	None		None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		17.1	17.1	34.5	37.5	63.5	56.5	55.5	63.5	56.5
Actuated g/C Ratio		0.16	0.16	0.31	0.34	0.58	0.51	0.50	0.58	0.51
v/c Ratio		0.48	0.20	0.41	0.51	0.22	0.42	0.43	0.26	0.38
Control Delay		47.2	12.0	28.6	29.1	10.0	13.2	2.6	35.0	35.9
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		47.2	12.0	28.6	29.1	10.0	13.2	2.6	35.0	35.9
LOS		D	B	C	C	A	B	A	D	D
Approach Delay		36.5			28.9		9.3			35.7
Approach LOS		D			C		A			D

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 22.3
 Intersection Capacity Utilization 49.8%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 15: Westfall & Mt. Hope



HCM Unsignalized Intersection Capacity Analysis
18: Iona & E Henrietta

Uof R IPD
7/9/2013



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑			↑↑
Volume (veh/h)	1	1	1807	50	4	963
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	1	2008	56	4	1070
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	868			1060		
pX, platoon unblocked	0.82	0.79			0.79	
vC, conflicting volume	2579	1032			2063	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2093	499			1810	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			98	
cM capacity (veh/h)	36	407			264	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	2	1339	725	361	713
Volume Left	1	0	0	4	0
Volume Right	1	0	56	0	0
cSH	67	1700	1700	264	1700
Volume to Capacity	0.03	0.79	0.43	0.02	0.42
Queue Length 95th (ft)	3	0	0	1	0
Control Delay (s)	60.6	0.0	0.0	0.6	0.0
Lane LOS	F			A	
Approach Delay (s)	60.6	0.0		0.2	
Approach LOS	F				

Intersection Summary					
Average Delay			0.1		
Intersection Capacity Utilization			61.5%	ICU Level of Service	B
Analysis Period (min)			15		

Timings
21: Crittenden Blvd & Kendrick

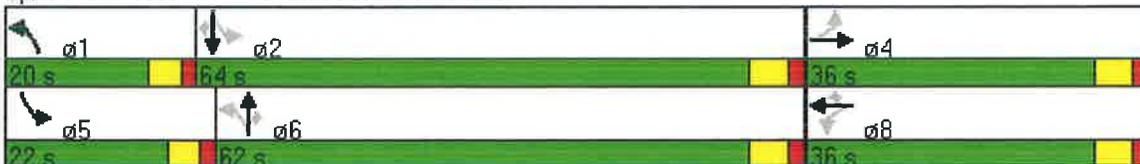


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↗	↗	↖	↗	↗
Volume (vph)	1	4	25	126	136	56	183	66	167	487	349
Turn Type	Perm		Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases		4		8		1	6		5	2	
Permitted Phases	4		8		8	6		6	2		2
Detector Phase	4	4	8	8	8	1	6	6	5	2	2
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	11.0	10.0	10.0	6.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	20.0	32.0	32.0	20.0	32.0	32.0
Total Split (s)	36.0	36.0	36.0	36.0	36.0	20.0	62.0	62.0	22.0	64.0	64.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	16.7%	51.7%	51.7%	18.3%	53.3%	53.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.5	2.0	2.0	1.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0	-1.0	-2.0	-3.0	-3.0	-2.0	-3.0	-3.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	Min	Min	Min	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	21.5	21.5		21.5	19.5	91.5	79.1	79.1	87.0	76.5	76.5
Actuated g/C Ratio	0.18	0.18		0.18	0.16	0.76	0.66	0.66	0.72	0.64	0.64
v/c Ratio	0.01	0.02		0.57	0.41	0.11	0.18	0.07	0.22	0.49	0.41
Control Delay	37.0	34.2		50.2	9.8	4.4	9.5	2.5	2.8	7.5	6.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
Total Delay	37.0	34.2		50.2	9.8	4.4	9.5	2.5	2.8	8.1	6.8
LOS	D	C		D	A	A	A	A	A	A	A
Approach Delay		34.7		31.0			7.1			6.8	
Approach LOS		C		C			A			A	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 11.3
 Intersection Capacity Utilization 59.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings
22: ELMWOOD AVENUE & Kendrick

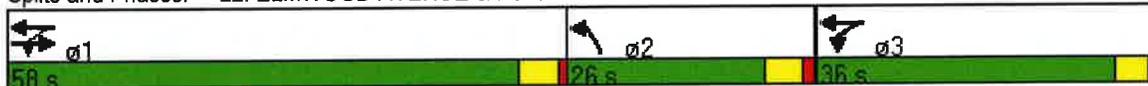


Lane Group	EBT	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↑↑	↑↑
Volume (vph)	760	418	534	194
Turn Type		pm+pt		
Protected Phases	1	3	1 3	2
Permitted Phases		1 3		
Detector Phase	1	3	1 3	2
Switch Phase				
Minimum Initial (s)	15.0	4.0		10.0
Minimum Split (s)	34.0	10.0		26.0
Total Split (s)	58.0	36.0	94.0	26.0
Total Split (%)	48.3%	30.0%	78.3%	21.7%
Yellow Time (s)	4.0	3.5		4.0
All-Red Time (s)	1.0	1.5		1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lead			Lag
Lead-Lag Optimize?				
Recall Mode	C-Max	None		None
Act Effect Green (s)	61.5	93.3	96.3	17.7
Actuated g/C Ratio	0.51	0.78	0.80	0.15
v/c Ratio	0.83	0.88	0.21	0.60
Control Delay	27.3	50.6	3.1	32.6
Queue Delay	1.9	0.0	0.0	0.0
Total Delay	29.2	50.6	3.1	32.6
LOS	C	D	A	C
Approach Delay	29.2		23.9	32.6
Approach LOS	C		C	C

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 27.7
 Intersection Capacity Utilization 82.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 22: ELMWOOD AVENUE & Kendrick



HCM Unsignalized Intersection Capacity Analysis
 25: Lattimore & Kendrick

Uof R IPD
 7/9/2013



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	15	290	95	126	391
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	17	322	106	140	434
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (fl)	795					
pX, platoon unblocked	0.90					
vC, conflicting volume	1089	375			428	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1043	375			428	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	98			88	
cM capacity (veh/h)	200	671			1132	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	13	17	428	140	434	
Volume Left	13	0	0	140	0	
Volume Right	0	17	106	0	0	
cSH	200	671	1700	1132	1700	
Volume to Capacity	0.07	0.02	0.25	0.12	0.26	
Queue Length 95th (ft)	5	2	0	11	0	
Control Delay (s)	24.3	10.5	0.0	8.6	0.0	
Lane LOS	C	B		A		
Approach Delay (s)	16.6		0.0	2.1		
Approach LOS	C					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			41.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 26: Lot #1 & Kendrick

Uof R IPD
 7/9/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑	↑	
Volume (veh/h)	1	17	258	384	238	160
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	19	287	427	264	178
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					957	
pX, platoon unblocked	0.92	0.92	0.92			
vC, conflicting volume	1353	353	442			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1340	252	349			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	74			
cM capacity (veh/h)	115	723	1112			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	20	287	427	442
Volume Left	1	287	0	0
Volume Right	19	0	0	178
cSH	558	1112	1700	1700
Volume to Capacity	0.04	0.26	0.25	0.26
Queue Length 95th (ft)	3	26	0	0
Control Delay (s)	11.7	9.4	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.7	3.8		0.0
Approach LOS	B			

Intersection Summary			
Average Delay		2.5	
Intersection Capacity Utilization		49.9%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 27: Westmoreland Rd & Kendrick

Uof R IPD
 7/9/2013

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	8	1	134	1	1	18	231	507	40	91	140	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	1	149	1	1	20	257	563	44	101	156	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)	1312											
pX, platoon unblocked												
vC, conflicting volume	1477	1464	586	1610	1483	159	163				608	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1477	1464	586	1610	1483	159	163				608	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	89	99	71	98	99	98	82				90	
cM capacity (veh/h)	80	94	510	47	92	886	1415				971	
Direction, Lane #	NB 1	NB 2	SB 1	NE 1	SW 1	SW 2						
Volume Total	10	149	22	864	101	163						
Volume Left	9	0	1	257	101	0						
Volume Right	0	149	20	44	0	8						
cSH	81	510	381	1415	971	1700						
Volume to Capacity	0.12	0.29	0.06	0.18	0.10	0.10						
Queue Length 95th (ft)	10	30	5	17	9	0						
Control Delay (s)	55.3	14.9	15.0	4.0	9.1	0.0						
Lane LOS	F	B	C	A	A							
Approach Delay (s)	17.5		15.0	4.0	3.5							
Approach LOS	C		C									
Intersection Summary												
Average Delay			5.7									
Intersection Capacity Utilization			63.5%	ICU Level of Service				B				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 91: Elmwood Ave & East Dr

Uof R IPD
 7/9/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↗
Volume (veh/h)	683	62	237	1066	72	151
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	759	69	263	1184	80	168
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	547			871		
pX, platoon unblocked			0.88		0.86	0.88
vC, conflicting volume			828		1912	414
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			535		1116	65
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			71		35	81
cM capacity (veh/h)			907		123	868

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	506	322	263	592	592	80	168
Volume Left	0	0	263	0	0	80	0
Volume Right	0	69	0	0	0	0	168
cSH	1700	1700	907	1700	1700	123	868
Volume to Capacity	0.30	0.19	0.29	0.35	0.35	0.65	0.19
Queue Length 95th (ft)	0	0	30	0	0	85	18
Control Delay (s)	0.0	0.0	10.6	0.0	0.0	76.9	10.1
Lane LOS			B			F	B
Approach Delay (s)	0.0		1.9			31.7	
Approach LOS						D	

Intersection Summary							
Average Delay			4.2				
Intersection Capacity Utilization			48.0%		ICU Level of Service		A
Analysis Period (min)			15				

Timings
162: ELMWOOD AVENUE & South

Uof R IPD
7/9/2013

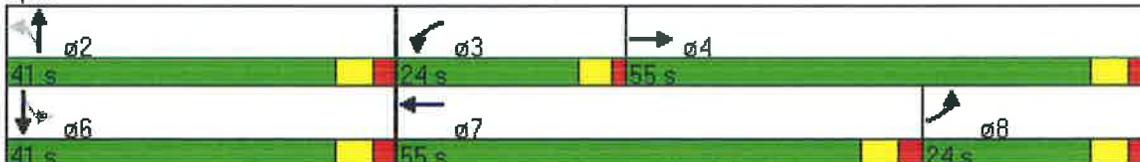


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	179	482	167	1104	4	434	40	340
Turn Type	custom		Prot		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	8				2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	24.0	55.0	24.0	55.0	41.0	41.0	41.0	41.0
Total Split (%)	20.0%	45.8%	20.0%	45.8%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?								
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	21.6	54.0	19.0	51.4		38.0		38.0
Actuated g/C Ratio	0.18	0.45	0.16	0.43		0.32		0.32
v/c Ratio	0.62	0.36	0.66	0.84		0.58		0.70
Control Delay	55.4	22.6	59.1	36.9		27.3		36.7
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	55.4	22.6	59.1	36.9		27.3		36.7
LOS	E	C	E	D		C		D
Approach Delay		31.1		39.7		27.3		36.7
Approach LOS		C		D		C		D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 35.1
 Intersection Capacity Utilization 86.9%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 162: ELMWOOD AVENUE & South



HCM Unsignalized Intersection Capacity Analysis
 172: East River Road & Murlin Drive

Uof R IPD
 7/9/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	
Volume (veh/h)	207	33	41	730	41	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	230	37	46	811	46	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	160			604		
pX, platoon unblocked					0.96	
vC, conflicting volume			267		745	133
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			267		646	133
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		88	96
cM capacity (veh/h)			1294		374	891

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	153	113	316	541	83
Volume Left	0	0	46	0	46
Volume Right	0	37	0	0	38
cSH	1700	1700	1294	1700	507
Volume to Capacity	0.09	0.07	0.04	0.32	0.16
Queue Length 95th (ft)	0	0	3	0	15
Control Delay (s)	0.0	0.0	1.4	0.0	13.5
Lane LOS			A		B
Approach Delay (s)	0.0		0.5		13.5
Approach LOS					B

Intersection Summary					
Average Delay			1.3		
Intersection Capacity Utilization			42.5%	ICU Level of Service	A
Analysis Period (min)			15		

Timings
393: ELMWOOD AVENUE & U of R

Uof R IPD
7/9/2013



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↖	↑↑	↖	↗
Volume (vph)	687	52	769	35	25
Turn Type		pm+pt			Perm
Protected Phases	1	3	13	2	
Permitted Phases		13			2
Detector Phase	1	3	13	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	72.0	15.0	87.0	33.0	33.0
Total Split (%)	60.0%	12.5%	72.5%	27.5%	27.5%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effct Green (s)	69.0	81.0	84.0	30.0	30.0
Actuated g/C Ratio	0.58	0.68	0.70	0.25	0.25
v/c Ratio	0.40	0.12	0.34	0.09	0.07
Control Delay	15.5	6.2	7.6	35.3	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.5	6.2	7.6	35.3	12.3
LOS	B	A	A	D	B
Approach Delay	15.5		7.5	25.7	
Approach LOS	B		A	C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.40
 Intersection Signal Delay: 11.8
 Intersection Capacity Utilization 38.5%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 393: ELMWOOD AVENUE & U of R



Timings
395: Crittenden Blvd & East Dr

Uof R IPD
7/9/2013



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↶	↷	↷	↶	↷
Volume (vph)	65	263	478	71	85
Turn Type	Perm				Perm
Protected Phases		1	1	2	
Permitted Phases	1				2
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	15.0	15.0
Total Split (s)	89.0	89.0	89.0	31.0	31.0
Total Split (%)	74.2%	74.2%	74.2%	25.8%	25.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effect Green (s)	99.8	99.8	99.8	14.2	14.2
Actuated g/C Ratio	0.83	0.83	0.83	0.12	0.12
v/c Ratio	0.12	0.10	0.24	0.38	0.35
Control Delay	3.0	2.3	2.2	53.2	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	2.3	2.2	53.2	12.8
LOS	A	A	A	D	B
Approach Delay		2.4	2.2	31.2	
Approach LOS		A	A	C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.38
 Intersection Signal Delay: 6.4
 Intersection Capacity Utilization 38.4%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	24	1	12	2	159	1591	11	943
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	14.0	39.0	14.0	39.0
Total Split (s)	32.0	32.0	32.0	32.0	14.0	74.0	14.0	74.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	11.7%	61.7%	11.7%	61.7%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	10.0	10.0	10.0	10.0	103.2	93.7	103.2	93.7
Actuated g/C Ratio	0.08	0.08	0.08	0.08	0.86	0.78	0.86	0.78
v/c Ratio	0.23	0.10	0.11	0.13	0.38	0.67	0.05	0.42
Control Delay	55.6	25.2	51.9	24.0	3.0	9.5	0.4	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
Total Delay	55.6	25.2	51.9	24.0	3.0	10.0	0.4	1.3
LOS	E	C	D	C	A	A	A	A
Approach Delay		45.2		35.0		9.4		1.3
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 7.2
 Intersection Capacity Utilization 67.2%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 470: MCH & E Henrietta



Timings
500: Crittenden & E Henrietta

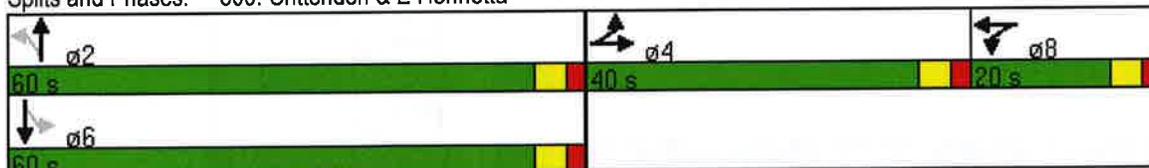


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↔	↕	↗	↕	↖	↕
Volume (vph)	306	8	1	44	678	25	1176
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	40.0	40.0	20.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	16.7%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	24.3	24.3	8.0	85.3	85.3	85.3	85.3
Actuated g/C Ratio	0.20	0.20	0.07	0.71	0.71	0.71	0.71
v/c Ratio	0.67	0.61	0.04	0.75	0.30	0.06	0.96
Control Delay	53.4	43.4	0.2	83.8	8.1	7.9	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	15.7
Total Delay	53.4	43.4	0.2	83.8	8.1	7.9	38.2
LOS	D	D	A	F	A	A	D
Approach Delay		48.5	0.2		12.7		37.9
Approach LOS		D	A		B		D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 105 (88%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 33.4
 Intersection Capacity Utilization 86.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 500: Crittenden & E Henrietta



Timings
501: Southland Drive & West Henrietta Road

Uof R IPD
7/9/2013



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔	↗	↖	↗	↖
Volume (vph)	34	1	7	1	1	1028	70	1359
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	74.0	74.0	14.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	67.3%	67.3%	12.7%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.5		10.5	87.0	87.0	95.6	96.2
Actuated g/C Ratio		0.10		0.10	0.79	0.79	0.87	0.87
v/c Ratio		0.30		0.14	0.00	0.42	0.18	0.49
Control Delay		45.5		28.0	4.0	8.7	3.4	4.4
Queue Delay		0.0		0.0	0.0	0.1	0.0	0.2
Total Delay		45.5		28.0	4.0	8.7	3.4	4.6
LOS		D		C	A	A	A	A
Approach Delay		45.5		28.0		8.7		4.5
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 7.1
 Intersection LOS: A
 Intersection Capacity Utilization 56.4%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 501: Southland Drive & West Henrietta Road



Timings
502: Doncaster Road & West Henrietta Road

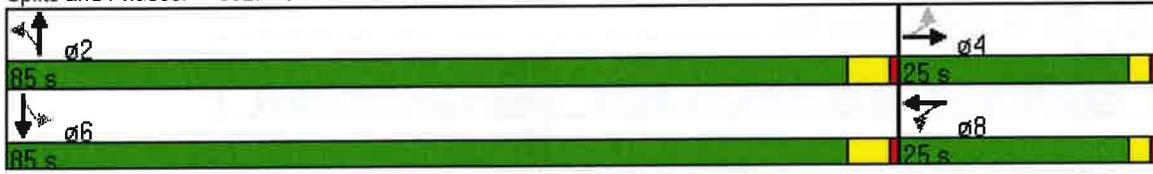


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Volume (vph)	10	1	3	2	1	1035	10	1356
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)		6.4		6.4		104.6		104.6
Actuated g/C Ratio		0.06		0.06		0.95		0.95
v/c Ratio		0.12		0.14		0.36		0.48
Control Delay		48.3		33.9		2.4		2.8
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		48.3		33.9		2.4		2.9
LOS		D		C		A		A
Approach Delay		48.3		33.9		2.4		2.9
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 75 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.48
 Intersection Signal Delay: 3.1
 Intersection Capacity Utilization 54.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 502: Doncaster Road & West Henrietta Road



Timings
503: Crittenden & West Henrietta Road

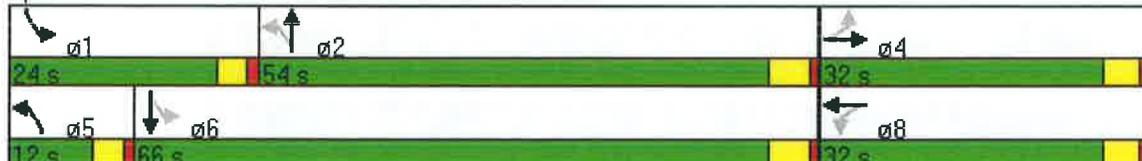


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔↔		↔↔	↔	↔↔	↔	↔↔
Volume (vph)	100	166	204	39	22	712	321	1016
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	9.0	25.0	8.0	25.0
Total Split (s)	32.0	32.0	32.0	32.0	12.0	54.0	24.0	66.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	10.9%	49.1%	21.8%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		25.1		25.1	66.5	59.5	78.9	72.7
Actuated g/C Ratio		0.23		0.23	0.60	0.54	0.72	0.66
v/c Ratio		0.93dl		0.85	0.07	0.50	0.74	0.49
Control Delay		51.0		37.4	9.5	28.8	21.7	12.8
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		51.0		37.4	9.5	28.8	21.7	12.8
LOS		D		D	A	C	C	B
Approach Delay		51.0		37.4		28.4		14.9
Approach LOS		D		D		C		B

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 26.2
 Intersection Capacity Utilization 79.1%
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 503: Crittenden & West Henrietta Road



Timings
504: BHTL & West Henrietta Road



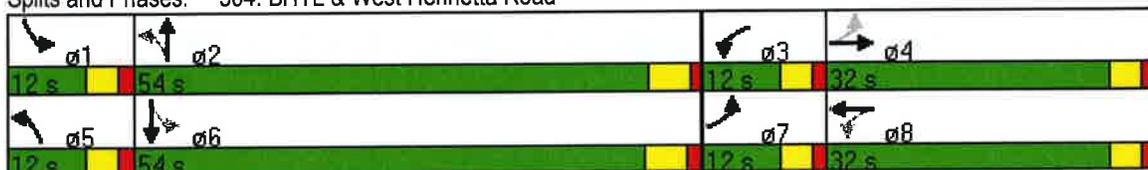
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↙	↕	↘	↕	↙	↕	↘	↕
Volume (vph)	145	326	118	293	35	636	200	885
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	12.0	32.0	12.0	32.0	12.0	54.0	12.0	54.0
Total Split (%)	10.9%	29.1%	10.9%	29.1%	10.9%	49.1%	10.9%	49.1%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	29.0	20.0	29.0	20.0	64.8	56.9	72.0	65.2
Actuated g/C Ratio	0.26	0.18	0.26	0.18	0.59	0.52	0.65	0.59
v/c Ratio	0.70	0.59	0.53	0.66	0.14	0.51	0.54	0.59
Control Delay	47.5	44.3	37.3	42.9	9.0	18.5	19.4	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	44.3	37.3	42.9	9.0	18.5	19.4	23.3
LOS	D	D	D	D	A	B	B	C
Approach Delay		45.3		41.6		18.1		22.7
Approach LOS		D		D		B		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 28.0
 Intersection Capacity Utilization 66.8%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 504: BHTL & West Henrietta Road



HCM Unsignalized Intersection Capacity Analysis
505: Crittenden & East River Road

Uof R IPD
7/9/2013



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	56	8	364	110	2	145
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	62	9	404	122	2	161
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	631	466			527	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	631	466			527	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	99			100	
cM capacity (veh/h)	444	597			1040	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	71	527	163
Volume Left	62	0	2
Volume Right	9	122	0
cSH	458	1700	1040
Volume to Capacity	0.16	0.31	0.00
Queue Length 95th (ft)	14	0	0
Control Delay (s)	14.3	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	14.3	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		36.1%	ICU Level of Service A
Analysis Period (min)		15	

PM Peak Hour

Existing Conditions

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Timings
1: East River Road & Kendrick



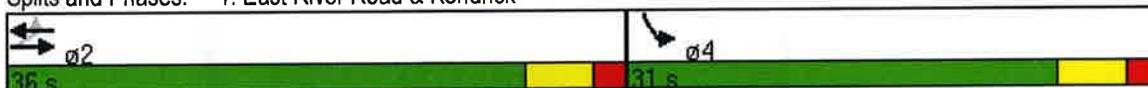
Lane Group	EBL	EBT	WBT	SBL
Lane Configurations		↕↕	↕↔	↕↕
Volume (vph)	75	150	114	536
Turn Type	Perm			
Protected Phases		2	2	4
Permitted Phases	2			
Detector Phase	2	2	2	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	6.0
Minimum Split (s)	26.0	26.0	26.0	12.0
Total Split (s)	36.0	36.0	36.0	31.0
Total Split (%)	53.7%	53.7%	53.7%	46.3%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Min	Min	Min	None
Act Effct Green (s)		15.1	15.1	18.9
Actuated g/C Ratio		0.38	0.38	0.47
v/c Ratio		0.24	0.23	0.47
Control Delay		10.2	4.9	7.7
Queue Delay		0.0	0.0	0.0
Total Delay		10.2	4.9	7.7
LOS		B	A	A
Approach Delay		10.2	4.9	7.7
Approach LOS		B	A	A

Intersection Summary

Cycle Length: 67
 Actuated Cycle Length: 40.1
 Natural Cycle: 40
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.47
 Intersection Signal Delay: 7.5
 Intersection Capacity Utilization 46.5%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: East River Road & Kendrick



Timings

2: East River Road & I-390 Off Ramp

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7/10/2013



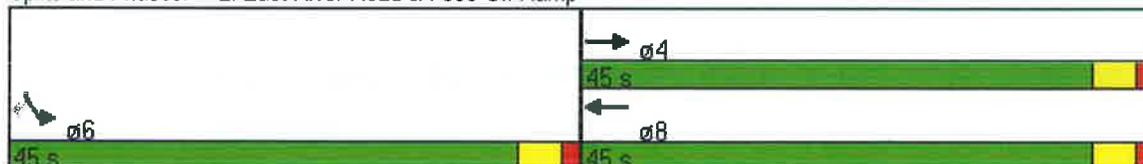
Lane Group	EBT	WBT	SBL	SBR
Lane Configurations	↑↑	↑↑	↘↘	↘
Volume (vph)	686	196	513	75
Turn Type				Perm
Protected Phases	4	8	6	
Permitted Phases				6
Detector Phase	4	8	6	6
Switch Phase				
Minimum Initial (s)	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0
Total Split (s)	45.0	45.0	45.0	45.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	Min	Min
Act Effct Green (s)	17.0	17.0	15.2	15.2
Actuated g/C Ratio	0.44	0.44	0.40	0.40
v/c Ratio	0.49	0.14	0.42	0.12
Control Delay	9.2	7.1	9.9	3.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.2	7.1	9.9	3.2
LOS	A	A	A	A
Approach Delay	9.2	7.1	9.1	
Approach LOS	A	A	A	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 38.4
 Natural Cycle: 50
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 8.9
 Intersection Capacity Utilization 40.3%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 2: East River Road & I-390 Off Ramp



Timings

5: I-390 NB On-Ramp & West Henrietta Road

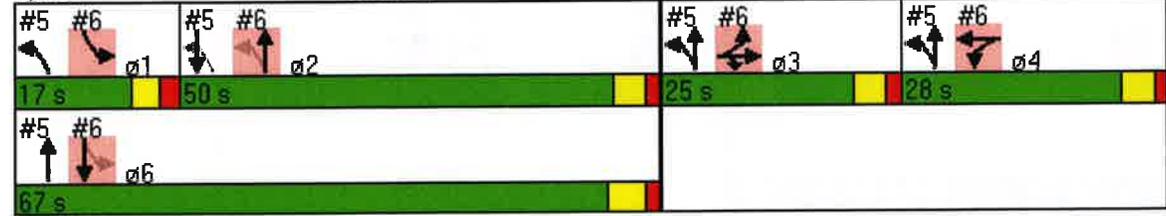


Lane Group	NBL	NBT	SBT	ø1	ø3	ø4	ø6
Lane Configurations	↙	↑↑	↑↑↑				
Volume (vph)	606	904	1114				
Turn Type	D.P+P						
Protected Phases	1 3 4	3 4 6	2	1	3	4	6
Permitted Phases	2						
Detector Phase	1 3 4	3 4 6	2				
Switch Phase							
Minimum Initial (s)			3.0	3.0	3.0	3.0	3.0
Minimum Split (s)			29.0	8.0	25.0	15.0	25.5
Total Split (s)	70.0	120.0	50.0	17.0	25.0	28.0	67.0
Total Split (%)	58.3%	100.0%	41.7%	14%	21%	23%	56%
Yellow Time (s)			3.5	3.0	3.5	3.5	4.0
All-Red Time (s)			1.5	2.0	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0				
Total Lost Time (s)	3.0	3.0	3.0				
Lead/Lag			Lag	Lead	Lead	Lag	
Lead-Lag Optimize?							
Recall Mode			C-Max	None	None	None	C-Max
Act Effect Green (s)	114.0	120.0	49.0				
Actuated g/C Ratio	0.95	1.00	0.41				
v/c Ratio	0.66	0.28	0.91				
Control Delay	40.2	0.1	42.5				
Queue Delay	0.0	0.0	16.5				
Total Delay	40.2	0.1	59.1				
LOS	D	A	E				
Approach Delay		16.2	59.1				
Approach LOS		B	E				

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.41
 Intersection Signal Delay: 38.7
 Intersection Capacity Utilization 74.2%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 5: I-390 NB On-Ramp & West Henrietta Road



Timings

6: East River Road & West Henrietta Road

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Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	190	518	545	113	68	77	1297	216	847
Turn Type	Split		Prot	Split		Perm		pm+pt	
Protected Phases	3	3	3	4	4		2	1	6
Permitted Phases						2		6	
Detector Phase	3	3	3	4	4	2	2	1	6
Switch Phase									
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	15.0	15.0	29.0	29.0	8.0	25.5
Total Split (s)	25.0	25.0	25.0	28.0	28.0	50.0	50.0	17.0	67.0
Total Split (%)	20.8%	20.8%	20.8%	23.3%	23.3%	41.7%	41.7%	14.2%	55.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.0	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	22.0	22.0	22.0	22.3	22.3	49.0	49.0	66.7	66.7
Actuated g/C Ratio	0.18	0.18	0.18	0.19	0.19	0.41	0.41	0.56	0.56
v/c Ratio	0.64	1.41	0.83	0.38	0.16	0.40	0.81	0.86	0.51
Control Delay	56.6	229.8	36.1	45.5	29.8	33.6	35.3	72.9	4.2
Queue Delay	1.6	68.7	0.0	0.0	0.0	0.0	22.8	54.4	0.9
Total Delay	58.2	298.5	36.1	45.5	29.8	33.6	58.1	127.3	5.1
LOS	E	F	D	D	C	C	E	F	A
Approach Delay		196.0			38.5		56.9		28.8
Approach LOS		F			D		E		C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.41

Intersection Signal Delay: 90.5

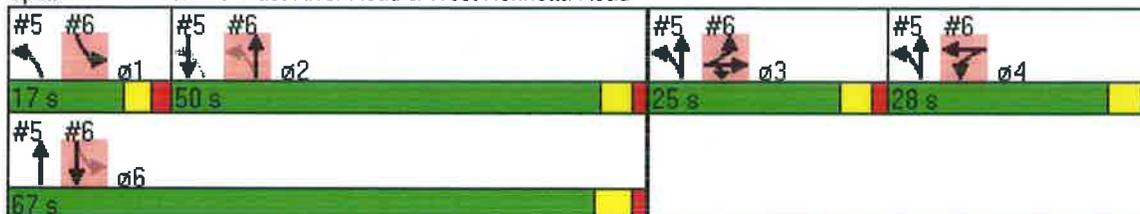
Intersection LOS: F

Intersection Capacity Utilization 78.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 6: East River Road & West Henrietta Road



Timings
7: I-390 NB & E Henrietta

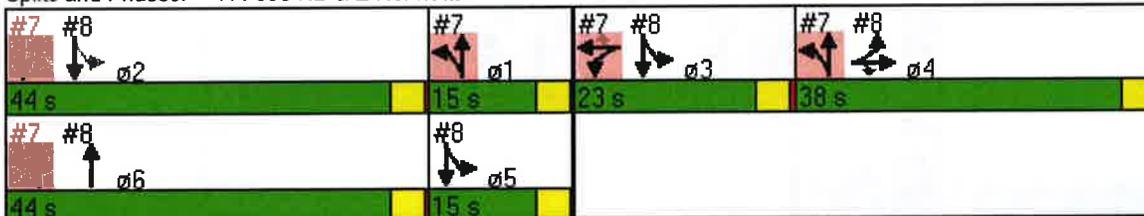


Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR	ø1	ø4	ø5	ø6
Lane Configurations	↘	↔	↗	↘	↑↑	↑↑↑	↗				
Volume (vph)	244	157	283	501	779	1120	394				
Turn Type	Split		Perm	pm+pt			Free				
Protected Phases	3	3		1 4	1 4 6	2		1	4	5	6
Permitted Phases			3	1 4 6			Free				
Detector Phase	3	3	3	1 4	1 4 6	2					
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0			4.0		3.0	3.0	3.0	4.0
Minimum Split (s)	20.0	20.0	20.0			20.0		8.0	25.0	8.0	20.0
Total Split (s)	23.0	23.0	23.0	53.0	97.0	44.0	0.0	15.0	38.0	15.0	44.0
Total Split (%)	19.2%	19.2%	19.2%	44.2%	80.8%	36.7%	0.0%	13%	32%	13%	37%
Yellow Time (s)	3.5	3.5	3.5			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5			0.5		0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0				
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Lead/Lag	Lead	Lead	Lead			Lead		Lag	Lag	Lag	Lead
Lead-Lag Optimize?											
Recall Mode	None	None	None			C-Max		None	None	Min	C-Max
Act Effct Green (s)	20.0	20.0	20.0	88.0	94.0	41.0	120.0				
Actuated g/C Ratio	0.17	0.17	0.17	0.73	0.78	0.34	1.00				
v/c Ratio	0.74	0.70	0.45	0.74	0.31	0.72	0.28				
Control Delay	65.0	47.6	10.4	44.3	0.2	23.4	0.4				
Queue Delay	0.0	0.0	0.0	0.1	0.1	0.1	0.0				
Total Delay	65.0	47.6	10.4	44.4	0.4	23.6	0.4				
LOS	E	D	B	D	A	C	A				
Approach Delay		43.5			17.6	17.5					
Approach LOS		D			B	B					

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 22.7
 Intersection Capacity Utilization 73.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 7: I-390 NB & E Henrietta



Timings

8: I-390 SB Ramp & E Henrietta



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	ø1	ø2	ø3	ø5
Lane Configurations											
Volume (vph)	182	824	478	1098	739	361	1003				
Turn Type	Split		Perm		Free	pm+pt					
Protected Phases	4	4		6		3 5	2 3 5	1	2	3	5
Permitted Phases			4		Free	2 3 5					
Detector Phase	4	4	4	6		3 5	2 3 5				
Switch Phase											
Minimum Initial (s)	3.0	3.0	3.0	4.0				3.0	4.0	4.0	3.0
Minimum Split (s)	25.0	25.0	25.0	20.0				8.0	20.0	20.0	8.0
Total Split (s)	38.0	38.0	38.0	44.0	0.0	38.0	82.0	15.0	44.0	23.0	15.0
Total Split (%)	31.7%	31.7%	31.7%	36.7%	0.0%	31.7%	68.3%	13%	37%	19%	13%
Yellow Time (s)	3.5	3.5	3.5	3.5				3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5				0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0				
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Lead/Lag	Lag	Lag	Lag	Lead				Lag	Lead	Lead	Lag
Lead-Lag Optimize?											
Recall Mode	None	None	None	C-Max				None	C-Max	None	Min
Act Effct Green (s)	35.0	35.0	35.0	41.0	120.0	76.0	79.0				
Actuated g/C Ratio	0.29	0.29	0.29	0.34	1.00	0.63	0.66				
v/c Ratio	0.39	1.11	0.88	0.70	0.52	0.69	0.48				
Control Delay	36.9	103.0	49.2	35.7	0.7	28.6	2.7				
Queue Delay	0.1	24.7	0.0	0.7	0.0	0.0	0.5				
Total Delay	37.0	127.7	49.2	36.4	0.7	28.6	3.2				
LOS	D	F	D	D	A	C	A				
Approach Delay		96.7		22.1			10.0				
Approach LOS		F		C			A				

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 42.2

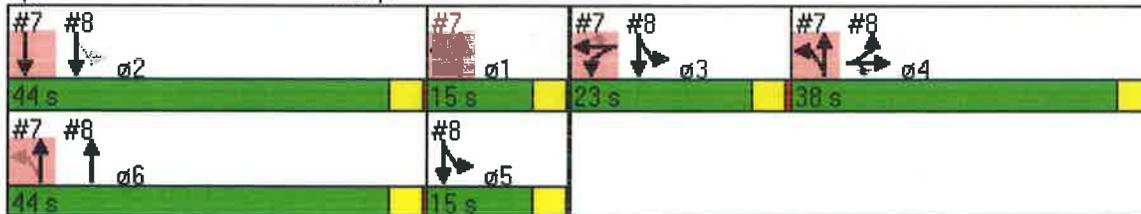
Intersection LOS: D

Intersection Capacity Utilization 73.3%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 8: I-390 SB Ramp & E Henrietta



Timings
10: Westfall & E Henrietta



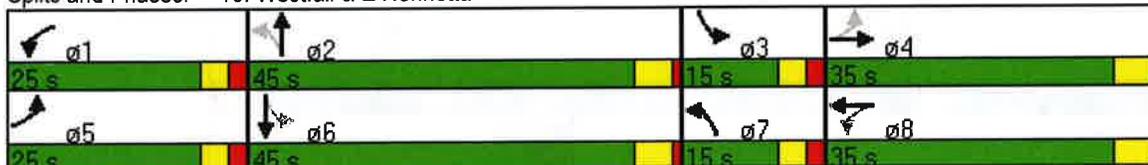
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗	↖	↗
Volume (vph)	125	311	375	297	92	767	209	953
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	5	4	1	8	7	2	3	6
Permitted Phases	4		8		2		6	
Detector Phase	5	4	1	8	7	2	3	6
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	7.0	5.0	7.0
Minimum Split (s)	10.0	29.0	10.0	29.0	10.0	30.0	10.0	30.0
Total Split (s)	25.0	35.0	25.0	35.0	15.0	45.0	15.0	45.0
Total Split (%)	20.8%	29.2%	20.8%	29.2%	12.5%	37.5%	12.5%	37.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	1.0	2.0	1.0	2.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	48.8	24.2	48.8	24.2	59.2	47.2	59.2	47.2
Actuated g/C Ratio	0.41	0.20	0.41	0.20	0.49	0.39	0.49	0.39
v/c Ratio	0.32	0.64	0.92	0.68	0.43	0.80	0.95	0.83
Control Delay	37.8	53.4	66.6	41.6	34.8	27.3	87.9	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0
Total Delay	37.8	53.4	66.6	41.6	34.8	28.0	87.9	26.0
LOS	D	D	E	D	C	C	F	C
Approach Delay		49.8		52.9		28.6		36.5
Approach LOS		D		D		C		D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 75 (63%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 39.8
 Intersection Capacity Utilization 85.7%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 10: Westfall & E Henrietta



Timings
11: South & E Henrietta

	↓	↘	↗	↑				
Lane Group	SBL	SET	NWT	NWR	ø1	ø3	ø6	ø8
Lane Configurations	↘↘	↗↗	↑	↗				
Volume (vph)	682	524	361	489				
Turn Type				custom				
Protected Phases	2		13	12	1	3	6	8
Permitted Phases		13		1				
Detector Phase	2	13	13	12				
Switch Phase								
Minimum Initial (s)	10.0				24.0	6.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	33.0	13.0
Total Split (s)	52.0	68.0	68.0	99.0	47.0	21.0	82.0	38.0
Total Split (%)	43.3%	56.7%	56.7%	82.5%	39%	18%	68%	32%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0				
Total Lost Time (s)	3.0	3.0	3.0	3.0				
Lead/Lag	Lag				Lead			
Lead-Lag Optimize?								
Recall Mode	None				C-Max	None	C-Max	None
Act Effct Green (s)	37.6	76.4	76.4	93.9				
Actuated g/C Ratio	0.31	0.64	0.64	0.78				
v/c Ratio	0.70	0.28	0.34	0.40				
Control Delay	35.8	17.3	8.5	4.7				
Queue Delay	0.5	0.0	0.0	0.0				
Total Delay	36.3	17.3	8.5	4.7				
LOS	D	B	A	A				
Approach Delay	36.3	17.3	6.3					
Approach LOS	D	B	A					

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 112 (93%), Referenced to phase 1:NWSE and 6;, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 19.1
 Intersection Capacity Utilization 46.1%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 11: South & E Henrietta



Timings
12: Crittenden Blvd & Mt. Hope

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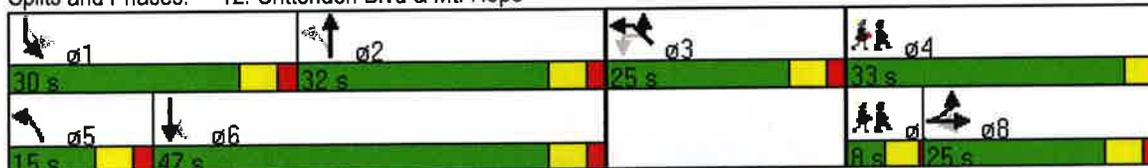


Lane Group	EBL	EBT	EBR	NBL	NBT	SBL	SBT	NWL2	NWL	NWR	ø4	ø7
Lane Configurations												
Volume (vph)	281	0	284	88	616	284	743	8	124	164		
Turn Type	Split		Perm	pm+pt		pm+pt		Perm		Prot		
Protected Phases	8	8		5	2	1	6		3	3	4	7
Permitted Phases			8	2		6		3				
Detector Phase	8	8	8	5	2	1	6	3	3	3		
Switch Phase												
Minimum Initial (s)	13.0	13.0	13.0	5.0	7.0	5.0	7.0	6.0	6.0	6.0	5.0	3.0
Minimum Split (s)	19.0	19.0	19.0	12.0	27.0	12.0	27.0	18.0	18.0	18.0	27.0	8.0
Total Split (s)	25.0	25.0	25.0	15.0	32.0	30.0	47.0	25.0	25.0	25.0	33.0	8.0
Total Split (%)	20.8%	20.8%	20.8%	12.5%	26.7%	25.0%	39.2%	20.8%	20.8%	20.8%	28%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.5	0.5
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lag					Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	C-Max	None	C-Max	None	None	None	None	None
Act Effct Green (s)	29.2	29.2	29.2	45.4	34.1	59.8	45.5		22.0	22.0		
Actuated g/C Ratio	0.24	0.24	0.24	0.38	0.28	0.50	0.38		0.18	0.18		
v/c Ratio	0.68	0.72	0.70	0.35	0.71	0.75	0.67		0.97	0.68		
Control Delay	47.0	50.8	49.1	18.0	18.0	20.9	26.9		113.3	56.3		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		
Total Delay	47.0	50.8	49.1	18.0	18.0	20.9	26.9		113.3	56.3		
LOS	D	D	D	B	B	C	C		F	E		
Approach Delay		48.9			18.0		25.4		80.6			
Approach LOS		D			B		C		F			

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 32 (27%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 35.4
 Intersection Capacity Utilization 70.1%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service C

Splits and Phases: 12: Crittenden Blvd & Mt. Hope



Timings

13: Elmwood Ave & Mt. Hope

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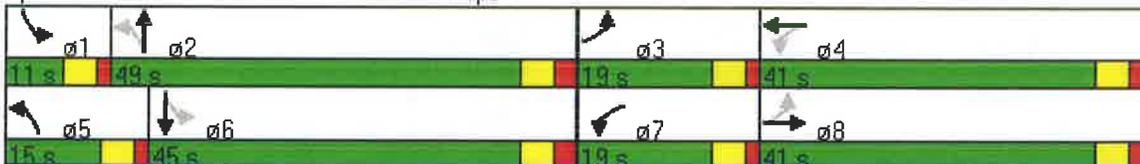
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	292	815	226	544	148	801	78	754
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	3	8	7	4	5	2	1	6
Permitted Phases	8		4		2		6	
Detector Phase	3	8	7	4	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	10.0	4.0	10.0	4.0	7.0	4.0	7.0
Minimum Split (s)	12.0	31.0	12.0	31.0	10.0	32.0	10.0	32.0
Total Split (s)	19.0	41.0	19.0	41.0	15.0	49.0	11.0	45.0
Total Split (%)	15.8%	34.2%	15.8%	34.2%	12.5%	40.8%	9.2%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	54.3	38.3	53.7	38.0	56.8	46.2	50.4	42.6
Actuated g/C Ratio	0.45	0.32	0.45	0.32	0.47	0.38	0.42	0.36
v/c Ratio	0.86	1.00	0.85	0.57	0.71	0.98	0.49	0.84
Control Delay	60.0	65.5	80.0	14.5	32.4	48.1	27.5	42.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	65.5	80.0	14.5	32.4	48.1	27.5	42.1
LOS	E	E	F	B	C	D	C	D
Approach Delay		64.3		33.1		46.3		41.0
Approach LOS		E		C		D		D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 86 (72%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 48.0
 Intersection Capacity Utilization 93.2%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 13: Elmwood Ave & Mt. Hope



Timings
14: Lattimore & Mt. Hope



Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	102	35	641	924
Turn Type	Perm			
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	27.0	24.0	24.0	24.0
Total Split (s)	30.0	90.0	90.0	90.0
Total Split (%)	25.0%	75.0%	75.0%	75.0%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	C-Max	C-Max	C-Max
Act Effct Green (s)	20.8		93.2	93.2
Actuated g/C Ratio	0.17		0.78	0.78
v/c Ratio	0.71		0.32	0.38
Control Delay	43.6		9.0	0.7
Queue Delay	0.0		0.0	0.0
Total Delay	43.6		9.0	0.7
LOS	D		A	A
Approach Delay	43.6		9.0	0.7
Approach LOS	D		A	A

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 8.7
 Intersection Capacity Utilization 62.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 14: Lattimore & Mt. Hope



Timings
15: Westfall & Mt. Hope

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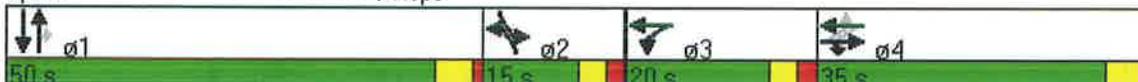


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↖	↗	↙	↘	↖	↗	↘	↙	↘
Volume (vph)	10	136	206	400	105	66	684	154	89	1035
Turn Type	Perm	custom		pm+pt		custom		Perm	custom	
Protected Phases		4	4	3	3 4	2	1		2	1
Permitted Phases	4		4	3 4		2		1	2	
Detector Phase	4	4	4	3	3 4	2	1	1	2	1
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	5.0		5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	29.0	29.0	29.0	11.0		13.0	40.0	40.0	13.0	40.0
Total Split (s)	35.0	35.0	35.0	20.0	55.0	15.0	50.0	50.0	15.0	50.0
Total Split (%)	29.2%	29.2%	29.2%	16.7%	45.8%	12.5%	41.7%	41.7%	12.5%	41.7%
Yellow Time (s)	4.0	4.0	4.0	3.0		3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	1.0	2.0		2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	None	None	None		None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		19.9	19.9	37.8	40.8	11.1	59.1	58.1	11.1	59.1
Actuated g/C Ratio		0.17	0.17	0.32	0.34	0.09	0.49	0.48	0.09	0.49
v/c Ratio		0.54	0.56	1.12	0.35	0.45	0.44	0.20	0.60	0.67
Control Delay		51.5	17.5	115.6	12.7	83.3	41.3	19.3	60.7	14.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		51.5	17.5	115.6	12.7	83.3	41.3	19.3	60.7	14.4
LOS		D	B	F	B	F	D	B	E	B
Approach Delay		31.6			81.7		40.6			18.0
Approach LOS		C			F		D			B

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 82 (68%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 39.2
 Intersection Capacity Utilization 76.2%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 15: Westfall & Mt. Hope



HCM Unsignalized Intersection Capacity Analysis
 18: Iola Circle & E Henrietta

Uof R IPD
 7/10/2013



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑			↑↑
Volume (veh/h)	1	1	1151	11	1	1514
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	1	1279	12	1	1682
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)			768			1062
pX, platoon unblocked	0.78	0.95			0.95	
vC, conflicting volume	2128	646			1291	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1607	525			1203	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	75	473			548	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	2	853	439	562	1121
Volume Left	1	0	0	1	0
Volume Right	1	0	12	0	0
cSH	129	1700	1700	548	1700
Volume to Capacity	0.02	0.50	0.26	0.00	0.66
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	33.3	0.0	0.0	0.1	0.0
Lane LOS	D			A	
Approach Delay (s)	33.3	0.0		0.0	
Approach LOS	D				

Intersection Summary					
Average Delay			0.0		
Intersection Capacity Utilization			52.5%	ICU Level of Service	A
Analysis Period (min)			15		

Timings
21: Crittenden Blvd & Kendrick

Uof R IPD
7/10/2013

	↖	→	↙	←	↘	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↑	↗	↖	↑	↗
Volume (vph)	74	182	31	31	282	15	626	61	173	353	10
Turn Type	Perm		Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases		4		8		1	6		5	2	
Permitted Phases	4		8		8	6		6	2		2
Detector Phase	4	4	8	8	8	1	6	6	5	2	2
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	11.0	10.0	10.0	6.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	20.0	32.0	32.0	20.0	32.0	32.0
Total Split (s)	35.0	35.0	35.0	35.0	35.0	30.0	55.0	55.0	30.0	55.0	55.0
Total Split (%)	29.2%	29.2%	29.2%	29.2%	29.2%	25.0%	45.8%	45.8%	25.0%	45.8%	45.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.5	2.0	2.0	1.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0	-1.0	-2.0	-3.0	-3.0	-2.0	-3.0	-3.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	Min	Min	Min	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	25.2	25.2		25.2	23.2	84.3	71.7	71.7	85.6	72.8	72.8
Actuated g/C Ratio	0.21	0.21		0.21	0.19	0.70	0.60	0.60	0.71	0.61	0.61
v/c Ratio	0.32	0.65		0.30	0.58	0.03	0.67	0.08	0.43	0.37	0.01
Control Delay	42.2	49.9		44.5	13.4	5.7	22.9	8.4	9.1	4.3	4.0
Queue Delay	0.4	0.0		0.0	0.5	0.0	0.0	0.0	0.0	0.3	0.0
Total Delay	42.5	49.9		44.5	13.9	5.7	22.9	8.4	9.1	4.6	4.0
LOS	D	D		D	B	A	C	A	A	A	A
Approach Delay		48.0		19.3			21.2			6.1	
Approach LOS		D		B			C			A	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 115 (96%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 20.6

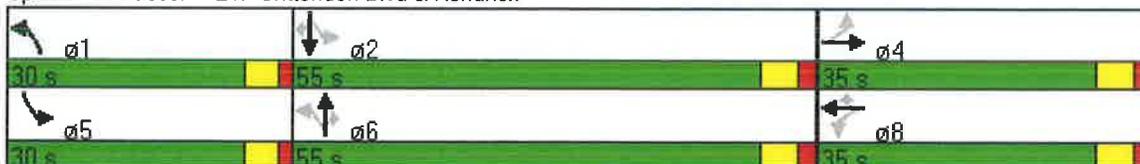
Intersection LOS: C

Intersection Capacity Utilization 75.6%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings
22: ELMWOOD AVENUE & Kendrick

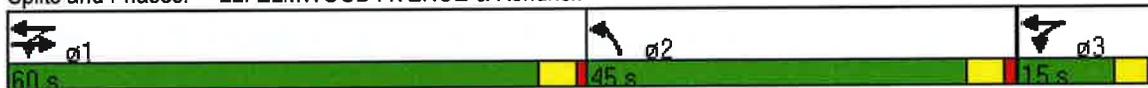


Lane Group	EBT	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↑↑	↑↑↑
Volume (vph)	658	76	890	722
Turn Type		pm+pt		
Protected Phases	1	3	1 3	2
Permitted Phases		1 3		
Detector Phase	1	3	1 3	2
Switch Phase				
Minimum Initial (s)	15.0	4.0		10.0
Minimum Split (s)	34.0	10.0		26.0
Total Split (s)	60.0	15.0	75.0	45.0
Total Split (%)	50.0%	12.5%	62.5%	37.5%
Yellow Time (s)	4.0	3.5		4.0
All-Red Time (s)	1.0	1.5		1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lead			Lag
Lead-Lag Optimize?				
Recall Mode	C-Max	None		None
Act Effect Green (s)	57.0	69.3	72.3	41.7
Actuated g/C Ratio	0.48	0.58	0.60	0.35
v/c Ratio	0.81	0.35	0.46	0.91
Control Delay	26.1	25.0	22.4	46.1
Queue Delay	0.7	0.0	0.0	1.7
Total Delay	26.7	25.0	22.4	47.7
LOS	C	C	C	D
Approach Delay	26.7		22.6	47.7
Approach LOS	C		C	D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 104 (87%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 32.0
 Intersection Capacity Utilization 79.5%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 22: ELMWOOD AVENUE & Kendrick



HCM Unsignalized Intersection Capacity Analysis
 25: Lattimore & Kendrick

Uof R IPD
 7/10/2013



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	57	117	587	52	97	315
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	63	130	652	58	108	350
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (fl)	795					
pX, platoon unblocked	0.96					
vC, conflicting volume	1247	681			710	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1235	681			710	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	61	71			88	
cM capacity (veh/h)	164	450			889	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	63	130	710	108	350	
Volume Left	63	0	0	108	0	
Volume Right	0	130	58	0	0	
cSH	164	450	1700	889	1700	
Volume to Capacity	0.39	0.29	0.42	0.12	0.21	
Queue Length 95th (ft)	42	30	0	10	0	
Control Delay (s)	40.3	16.2	0.0	9.6	0.0	
Lane LOS	E	C		A		
Approach Delay (s)	24.1		0.0	2.3		
Approach LOS	C					
Intersection Summary						
Average Delay			4.2			
Intersection Capacity Utilization			52.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 26: Lot #1 & Kendrick

Uof R IPD
 7/10/2013

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	24	474	33	615	370	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	527	37	683	411	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					957	
pX, platoon unblocked	0.97	0.97	0.97			
vC, conflicting volume	1170	413	416			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1161	385	387			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	18	97			
cM capacity (veh/h)	203	646	1141			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	553	37	683	416		
Volume Left	27	37	0	0		
Volume Right	527	0	0	4		
cSH	585	1141	1700	1700		
Volume to Capacity	0.95	0.03	0.40	0.24		
Queue Length 95th (ft)	315	2	0	0		
Control Delay (s)	51.7	8.3	0.0	0.0		
Lane LOS	F	A				
Approach Delay (s)	51.7	0.4		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			17.1			
Intersection Capacity Utilization			69.7%	ICU Level of Service		C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 27: Westmoreland & Kendrick

Uof R IPD
 7/10/2013

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	90	1	23	19	1	76	4	217	15	156	662	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	100	1	26	21	1	84	4	241	17	173	736	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						8						
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1384	1349	736	1367	1342	249	737			258		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1384	1349	736	1367	1342	249	737			258		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	99	94	80	99	89	99			87		
cM capacity (veh/h)	96	130	419	104	131	789	869			1307		
Direction, Lane #	SE 1	NW 1	NE 1	SW 1	SW 2							
Volume Total	127	107	262	173	737							
Volume Left	100	21	4	173	0							
Volume Right	26	84	17	0	1							
cSH	114	505	869	1307	1700							
Volume to Capacity	1.11	0.21	0.01	0.13	0.43							
Queue Length 95th (ft)	193	20	0	11	0							
Control Delay (s)	189.7	18.0	0.2	8.2	0.0							
Lane LOS	F	C	A	A								
Approach Delay (s)	189.7	18.0	0.2	1.6								
Approach LOS	F	C										
Intersection Summary												
Average Delay			19.5									
Intersection Capacity Utilization			70.6%		ICU Level of Service				C			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 91: Elmwood Ave & East Dr

Uof R IPD
 7/10/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↗
Volume (veh/h)	1007	98	82	813	77	221
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1119	109	91	903	86	246
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	329			1089		
pX, platoon unblocked				0.82	0.88	0.82
vC, conflicting volume				1228	1807	614
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				851	1083	107
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				86	46	68
cM capacity (veh/h)				646	160	765

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	746	482	91	452	452	86	246
Volume Left	0	0	91	0	0	86	0
Volume Right	0	109	0	0	0	0	246
cSH	1700	1700	646	1700	1700	160	765
Volume to Capacity	0.44	0.28	0.14	0.27	0.27	0.54	0.32
Queue Length 95th (ft)	0	0	12	0	0	67	35
Control Delay (s)	0.0	0.0	11.5	0.0	0.0	50.8	11.9
Lane LOS	B			F			B
Approach Delay (s)	0.0		1.1		22.0		
Approach LOS				C			

Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			51.3%		ICU Level of Service	A
Analysis Period (min)			15			

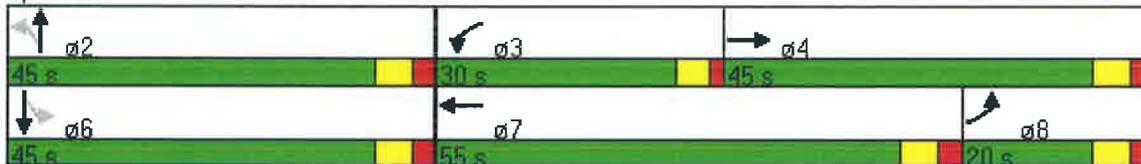


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↕	↖	↕		↕		↕
Volume (vph)	181	1109	182	568	5	458	54	362
Turn Type	custom		Prot		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	8				2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	20.0	45.0	30.0	55.0	45.0	45.0	45.0	45.0
Total Split (%)	16.7%	37.5%	25.0%	45.8%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?								
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	33.2	47.5	21.5	35.8		42.0		42.0
Actuated g/C Ratio	0.28	0.40	0.18	0.30		0.35		0.35
v/c Ratio	0.41	0.90	0.64	0.63		0.62		0.67
Control Delay	25.9	26.5	54.4	38.6		27.0		36.1
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	25.9	26.5	54.4	38.6		27.0		36.1
LOS	C	C	D	D		C		D
Approach Delay		26.5		42.3		27.0		36.1
Approach LOS		C		D		C		D

Intersection Summary

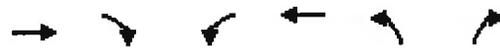
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 86 (72%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 31.9
 Intersection Capacity Utilization 88.5%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 162: ELMWOOD AVENUE & South



HCM Unsignalized Intersection Capacity Analysis
172: East River Road & Murlin Drive

Uof R IPD
7/10/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	
Volume (veh/h)	628	58	27	244	31	58
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	698	64	30	271	34	64
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	161			926		
pX, platoon unblocked						
vC, conflicting volume			762		926	381
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			762		926	381
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		87	90
cM capacity (veh/h)			846		258	617

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	465	297	120	181	99
Volume Left	0	0	30	0	34
Volume Right	0	64	0	0	64
cSH	1700	1700	846	1700	416
Volume to Capacity	0.27	0.17	0.04	0.11	0.24
Queue Length 95th (ft)	0	0	3	0	23
Control Delay (s)	0.0	0.0	2.6	0.0	16.3
Lane LOS			A		C
Approach Delay (s)	0.0		1.0		16.3
Approach LOS					C

Intersection Summary					
Average Delay			1.7		
Intersection Capacity Utilization			39.7%	ICU Level of Service	A
Analysis Period (min)			15		



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑
Volume (vph)	815	33	862	26	36
Turn Type		pm+pt			Perm
Protected Phases	1	3	1 3	2	
Permitted Phases		1 3			2
Detector Phase	1	3	1 3	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	65.0	20.0	85.0	35.0	35.0
Total Split (%)	54.2%	16.7%	70.8%	29.2%	29.2%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effct Green (s)	62.1	79.0	82.0	32.0	32.0
Actuated g/C Ratio	0.52	0.66	0.68	0.27	0.27
v/c Ratio	0.52	0.08	0.40	0.06	0.09
Control Delay	15.8	4.7	5.8	33.4	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	4.7	5.8	33.4	10.4
LOS	B	A	A	C	B
Approach Delay	15.8		5.8	20.1	
Approach LOS	B		A	C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 25 (21%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 11.0
 Intersection Capacity Utilization 39.1%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 393: ELMWOOD AVENUE & U of R



Timings
395: Crittenden Blvd & East Dr

Uof R IPD
7/10/2013



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↖	↕	↕	↖	↗
Volume (vph)	55	554	307	129	94
Turn Type	Perm				Perm
Protected Phases		1	1	2	
Permitted Phases	1				2
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	29.5	29.5
Total Split (s)	73.0	73.0	73.0	47.0	47.0
Total Split (%)	60.8%	60.8%	60.8%	39.2%	39.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	95.5	95.5	95.5	18.5	18.5
Actuated g/C Ratio	0.80	0.80	0.80	0.15	0.15
v/c Ratio	0.08	0.22	0.14	0.52	0.31
Control Delay	3.2	3.1	4.9	52.9	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.2	3.1	4.9	52.9	10.3
LOS	A	A	A	D	B
Approach Delay		3.1	4.9	35.0	
Approach LOS		A	A	C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 9.7
 Intersection Capacity Utilization 32.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr



Timings
470: MCH & E Henrietta

Uof R IPD
7/10/2013



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	50	1	73	1	8	1003	10	1376
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	14.0	39.0	14.0	39.0
Total Split (s)	35.0	35.0	35.0	35.0	15.0	70.0	15.0	70.0
Total Split (%)	29.2%	29.2%	29.2%	29.2%	12.5%	58.3%	12.5%	58.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	4.0	3.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	15.9	15.9	15.9	15.9	95.5	93.4	95.5	92.4
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.80	0.78	0.80	0.77
v/c Ratio	0.31	0.27	0.51	0.10	0.03	0.42	0.03	0.58
Control Delay	49.9	12.7	58.6	17.9	2.0	3.9	0.4	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3
Total Delay	49.9	12.7	58.6	17.9	2.0	4.0	0.4	1.7
LOS	D	B	E	B	A	A	A	A
Approach Delay		28.8		49.6		4.0		1.7
Approach LOS		C		D		A		A

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 63 (53%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.4
 Intersection Capacity Utilization 56.9%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 470: MCH & E Henrietta



Timings
500: Crittenden & E Henrietta

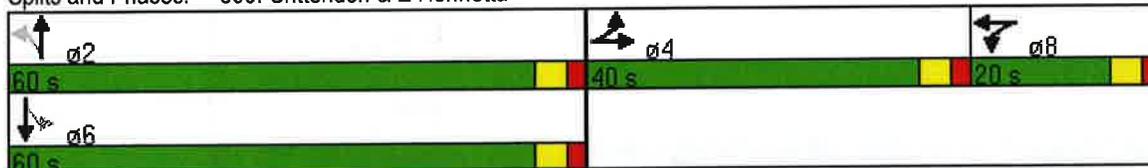


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↔	↔	↖	↕	↖	↕
Volume (vph)	809	1	1	75	1074	9	1129
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	40.0	40.0	20.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	16.7%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	37.0	37.0	8.5	69.9	69.9	69.9	69.9
Actuated g/C Ratio	0.31	0.31	0.07	0.58	0.58	0.58	0.58
v/c Ratio	1.08	0.99	0.12	1.30	0.58	0.06	0.85
Control Delay	101.3	76.5	24.2	238.6	18.1	13.6	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.3	76.5	24.2	238.6	18.1	13.6	21.6
LOS	F	E	C	F	B	B	C
Approach Delay		89.5	24.2		32.4		21.6
Approach LOS		F	C		C		C

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 105 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.30
 Intersection Signal Delay: 42.7
 Intersection Capacity Utilization 91.7%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 500: Crittenden & E Henrietta



Timings
501: Southland Drive & West Henrietta Road

Uof R IPD
7/10/2013



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕	↙	↕	↙	↕
Volume (vph)	9	1	25	1	6	1452	24	1465
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	75.0	75.0	13.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	68.2%	68.2%	11.8%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.7		10.7	86.7	86.7	93.3	93.3
Actuated g/C Ratio		0.10		0.10	0.79	0.79	0.85	0.85
v/c Ratio		0.23		0.59	0.03	0.59	0.09	0.55
Control Delay		27.7		21.4	5.0	8.0	2.4	3.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.5
Total Delay		27.7		21.4	5.0	8.0	2.4	4.0
LOS		C		C	A	A	A	A
Approach Delay		27.7		21.4		8.0		4.0
Approach LOS		C		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 62 (56%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 6.9
 Intersection Capacity Utilization 57.4%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 501: Southland Drive & West Henrietta Road



Timings
502: Doncaster Road & West Henrietta Road

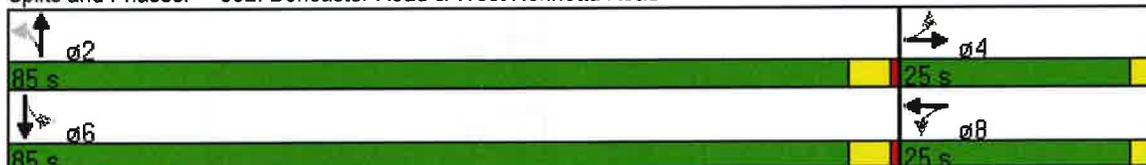


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕↕		↕↕
Volume (vph)	3	1	14	1	6	1457	12	1480
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)		7.0		7.0		101.6		101.6
Actuated g/C Ratio		0.06		0.06		0.92		0.92
v/c Ratio		0.07		0.30		0.53		0.55
Control Delay		39.5		38.9		4.1		1.1
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		39.5		38.9		4.1		1.2
LOS		D		D		A		A
Approach Delay		39.5		38.9		4.1		1.2
Approach LOS		D		D		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 71 (65%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.55
 Intersection Signal Delay: 3.0
 Intersection Capacity Utilization 59.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 502: Doncaster Road & West Henrietta Road



Timings
503: Crittenden & West Henrietta Road

Uof R IPD
7/10/2013

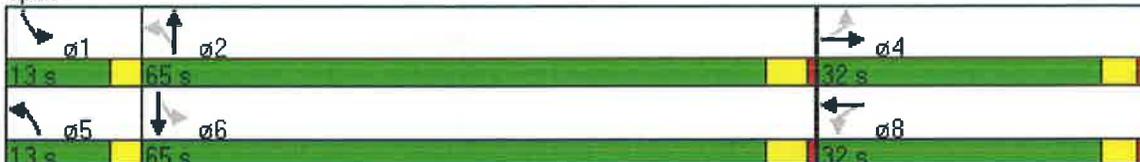


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔↔		↔↔	↔	↔↔	↔	↔↔
Volume (vph)	23	63	254	167	87	1229	195	1198
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	9.0	25.0	8.0	25.0
Total Split (s)	32.0	32.0	32.0	32.0	13.0	65.0	13.0	65.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	11.8%	59.1%	11.8%	59.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	0.0	1.0	0.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	0.0	-2.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		29.0		29.0	69.7	62.0	74.1	64.3
Actuated g/C Ratio		0.26		0.26	0.63	0.56	0.67	0.58
v/c Ratio		0.21		0.95	0.43	0.82	0.94	0.71
Control Delay		22.5		59.4	13.2	36.4	67.5	20.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		22.5		59.4	13.2	36.4	67.5	20.0
LOS		C		E	B	D	E	C
Approach Delay		22.5		59.4		35.1		26.2
Approach LOS		C		E		D		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 35.2
 Intersection Capacity Utilization 84.1%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 503: Crittenden & West Henrietta Road



Timings
504: BHTL & West Henrietta Road

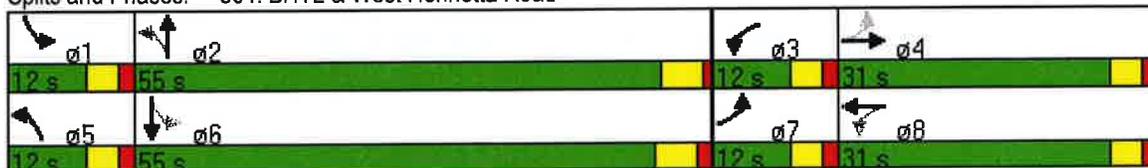


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↙	↕	↙	↕	↙	↕	↙	↕
Volume (vph)	168	268	322	310	38	1191	138	1187
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	12.0	31.0	12.0	31.0	12.0	55.0	12.0	55.0
Total Split (%)	10.9%	28.2%	10.9%	28.2%	10.9%	50.0%	10.9%	50.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	31.4	22.4	31.4	22.4	64.2	56.2	69.0	62.7
Actuated g/C Ratio	0.29	0.20	0.29	0.20	0.58	0.51	0.63	0.57
v/c Ratio	0.87	0.50	1.28	0.71	0.21	0.86	0.65	0.75
Control Delay	66.7	38.3	182.6	38.2	11.4	30.4	25.4	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.7	38.3	182.6	38.2	11.4	30.4	25.4	22.5
LOS	E	D	F	D	B	C	C	C
Approach Delay		48.0		95.6		29.9		22.8
Approach LOS		D		F		C		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 49 (45%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.28
 Intersection Signal Delay: 42.1
 Intersection Capacity Utilization 87.1%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 504: BHTL & West Henrietta Road



HCM Unsignalized Intersection Capacity Analysis
505: Crittenden & East River Road

Uof R IPD
7/10/2013



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	101	11	186	34	12	280
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	112	12	207	38	13	311
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	563	226			244	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	563	226			244	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	98			99	
cM capacity (veh/h)	482	814			1322	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	124	244	324
Volume Left	112	0	13
Volume Right	12	38	0
cSH	502	1700	1322
Volume to Capacity	0.25	0.14	0.01
Queue Length 95th (ft)	24	0	1
Control Delay (s)	14.5	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	14.5	0.0	0.4
Approach LOS	B		

Intersection Summary			
Average Delay		2.8	
Intersection Capacity Utilization		37.4%	ICU Level of Service A
Analysis Period (min)		15	

AM Peak Hour

Background Conditions 5-Year

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HCM Unsignalized Intersection Capacity Analysis
 1: East River Road & Kendrick

Uof R IPD
 7/11/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized						Yes						
Volume (veh/h)	168	114	16	34	228	707	9	35	41	114	12	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	187	127	18	38	253	786	10	39	46	127	13	70
Approach Volume (veh/h)		331			291			94			210	
Crossing Volume (veh/h)		178			236			440			301	
High Capacity (veh/h)		1205			1151			979			1093	
High v/c (veh/h)		0.27			0.25			0.10			0.19	
Low Capacity (veh/h)		998			950			795			897	
Low v/c (veh/h)		0.33			0.31			0.12			0.23	
Intersection Summary												
Maximum v/c High			0.27									
Maximum v/c Low			0.33									
Intersection Capacity Utilization		62.4%			ICU Level of Service					B		

Timings
2: East River Road & I-390 S On Ramp

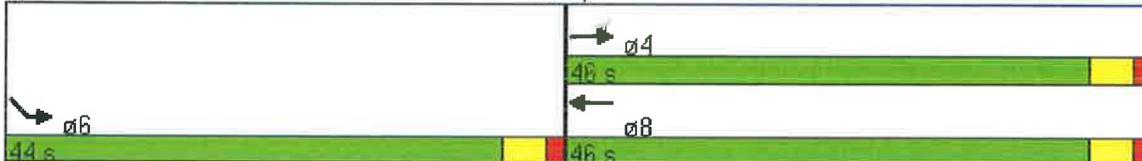
	↖	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SEL	SER
Lane Configurations	↖	↑↑	↑↓	↖↗	↖
Volume (vph)	36	233	568	989	334
Turn Type	Perm				Free
Protected Phases		4	8	6	
Permitted Phases	4				Free
Detector Phase	4	4	8	6	
Switch Phase					
Minimum Initial (s)	3.0	3.0	3.0	3.0	
Minimum Split (s)	25.0	25.0	25.0	25.0	
Total Split (s)	46.0	46.0	46.0	44.0	0.0
Total Split (%)	51.1%	51.1%	51.1%	48.9%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	3.0	3.0	3.0	2.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	
Act Effect Green (s)	17.7	19.8	19.8	25.9	52.0
Actuated g/C Ratio	0.34	0.38	0.38	0.50	1.00
v/c Ratio	0.23	0.19	0.52	0.64	0.23
Control Delay	18.1	12.3	14.9	12.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	12.3	14.9	12.0	0.3
LOS	B	B	B	B	A
Approach Delay		13.1	14.9	9.1	
Approach LOS		B	B	A	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 52
 Natural Cycle: 50
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 11.2
 Intersection Capacity Utilization 59.7%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 2: East River Road & I-390 S On Ramp



Intersection Sign configuration not allowed in HCM analysis.

Timings

6: East River Road & West Henrietta Road

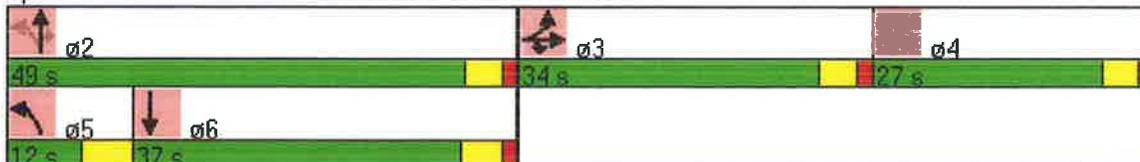


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Configurations									
Volume (vph)	444	62	716	101	429	118	929	65	667
Turn Type	Split		Prot	Split		pm+pt		Perm	
Protected Phases	3	3	3	4	4	5	2		6
Permitted Phases						2		2	
Detector Phase	3	3	3	4	4	5	2	2	6
Switch Phase									
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	15.0	15.0	8.0	29.0	29.0	25.5
Total Split (s)	34.0	34.0	34.0	27.0	27.0	12.0	49.0	49.0	37.0
Total Split (%)	30.9%	30.9%	30.9%	24.5%	24.5%	10.9%	44.5%	44.5%	33.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	5.0	3.5	3.5	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	0.0	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead			Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	29.0	29.0	29.0	23.6	23.6	48.4	48.4	47.4	36.2
Actuated g/C Ratio	0.26	0.26	0.26	0.21	0.21	0.44	0.44	0.43	0.33
v/c Ratio	0.79	0.62	0.62	0.29	0.83	0.55	0.46	0.10	0.71
Control Delay	51.7	17.3	10.1	38.4	49.5	24.0	21.3	7.4	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	17.3	10.1	38.4	49.5	24.0	21.3	7.4	20.9
LOS	D	B	B	D	D	C	C	A	C
Approach Delay		23.7			47.8		20.8		20.9
Approach LOS		C			D		C		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 26.6
 Intersection LOS: C
 Intersection Capacity Utilization 76.7%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 6: East River Road & West Henrietta Road



Timings
8: I-390 SB Ramp & E Henrietta

Uof R IPD
7/9/2013

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	ø2	ø3	ø5
Lane Configurations										
Volume (vph)	493	83	892	902	220	251	1471			
Turn Type	Split		Perm		Free	pm+pt				
Protected Phases	4	4		6		3 5	2 3 5	2	3	5
Permitted Phases			4		Free	2 3 5				
Detector Phase	4	4	4	6		3 5	2 3 5			
Switch Phase										
Minimum Initial (s)	3.0	3.0	3.0	4.0				4.0	4.0	3.0
Minimum Split (s)	25.5	25.5	25.5	20.0				20.0	20.0	8.0
Total Split (s)	47.0	47.0	47.0	36.0	0.0	32.0	80.0	48.0	20.0	12.0
Total Split (%)	40.9%	40.9%	40.9%	31.3%	0.0%	27.8%	69.6%	42%	17%	10%
Yellow Time (s)	5.0	5.0	5.0	3.5				3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5				0.5	0.5	0.5
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-1.0	-1.0	-1.0	-1.0			
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lead/Lag	Lag	Lag	Lag	Lead					Lead	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	C-Max				C-Max	None	Min
Act Effct Green (s)	42.8	42.8	42.8	34.7	115.0	66.2	66.2			
Actuated g/C Ratio	0.37	0.37	0.37	0.30	1.00	0.58	0.58			
v/c Ratio	0.67	0.90dr	0.90	0.94	0.15	0.29	0.80			
Control Delay	36.3	33.1	53.7	56.0	0.2	21.0	19.1			
Queue Delay	3.3	2.2	0.0	0.0	0.0	0.0	5.8			
Total Delay	39.6	35.4	53.7	56.0	0.2	21.0	24.9			
LOS	D	D	D	E	A	C	C			
Approach Delay		42.0		45.1			24.3			
Approach LOS		D		D			C			

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 114 (99%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 35.7
 Intersection LOS: D
 Intersection Capacity Utilization 84.2%
 ICU Level of Service E
 Analysis Period (min) 15
 Description: Counts from NSDOT 3/22/05
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: I-390 SB Ramp & E Henrietta



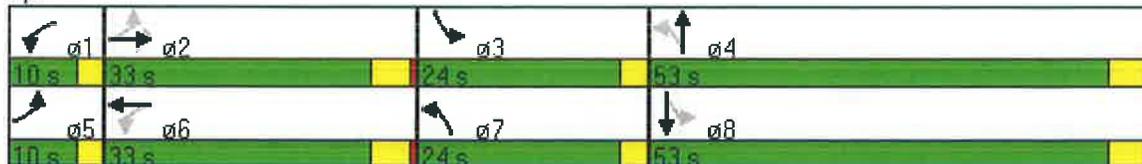


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↵	↕	↵↕	↕	↵	↕	↗	↵	↕
Volume (vph)	89	314	222	277	236	1069	465	198	916
Turn Type	pm+pt		pm+pt		pm+pt		custom	pm+pt	
Protected Phases	5	2	1	6	7	4		3	8
Permitted Phases	2		6		4		2	8	
Detector Phase	5	2	1	6	7	4	2	3	8
Switch Phase									
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	10.0	7.0	5.0	10.0
Minimum Split (s)	10.0	30.0	10.0	30.0	10.0	29.0	30.0	10.0	29.0
Total Split (s)	10.0	33.0	10.0	33.0	24.0	53.0	33.0	24.0	53.0
Total Split (%)	8.3%	27.5%	8.3%	27.5%	20.0%	44.2%	27.5%	20.0%	44.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0	-2.0	-1.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	C-Max	None	None
Act Effct Green (s)	42.4	34.5	42.4	34.5	65.6	48.6	33.5	65.6	48.6
Actuated g/C Ratio	0.35	0.29	0.35	0.29	0.55	0.40	0.28	0.55	0.40
v/c Ratio	0.37	0.44	0.42	0.50	0.83	0.83	0.74	0.70	0.80
Control Delay	31.3	35.7	29.2	28.3	54.3	33.5	19.6	32.4	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	5.8	1.1	0.0	0.0
Total Delay	31.3	35.7	29.2	28.3	54.3	39.3	20.7	32.4	30.6
LOS	C	D	C	C	D	D	C	C	C
Approach Delay		34.9		28.6		36.4			30.9
Approach LOS		C		C		D			C

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 48 (40%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 33.3
 Intersection Capacity Utilization 74.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 10: Westfall & E Henrietta



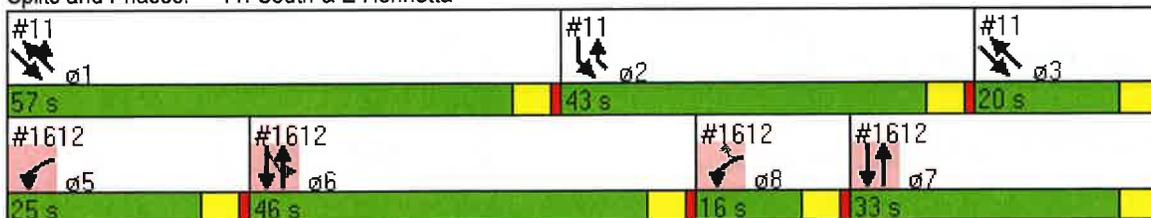
Timings
11: South & E Henrietta

Lane Group	SBL	SET	NWT	NWR	ø1	ø3	ø5	ø6	ø7	ø8
Lane Configurations										
Volume (vph)	605	457	518	714						
Turn Type				custom						
Protected Phases	2	13	13	12	1	3	5	6	7	8
Permitted Phases		13		1						
Detector Phase	2	13	13	12						
Switch Phase										
Minimum Initial (s)	10.0				24.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	21.0	33.0	33.0	13.0
Total Split (s)	43.0	77.0	77.0	100.0	57.0	20.0	25.0	46.0	33.0	16.0
Total Split (%)	35.8%	64.2%	64.2%	83.3%	48%	17%	21%	38%	28%	13%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0						
Total Lost Time (s)	3.0	3.0	3.0	3.0						
Lead/Lag	Lag				Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None				C-Max	None	C-Max	None	None	None
Act Effct Green (s)	34.5	79.5	79.5	94.4						
Actuated g/C Ratio	0.29	0.66	0.66	0.79						
v/c Ratio	0.68	0.23	0.47	0.56						
Control Delay	29.7	9.0	2.9	13.1						
Queue Delay	11.9	0.0	0.0	0.7						
Total Delay	41.6	9.0	2.9	13.8						
LOS	D	A	A	B						
Approach Delay	41.6	9.0	9.3							
Approach LOS	D	A	A							

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 28 (23%), Referenced to phase 1: NWSE and 5., Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 17.7
 Intersection Capacity Utilization 51.2%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 11: South & E Henrietta



Timings
12: Crittenden Blvd & Mt. Hope

Uof R IPD
7/11/2013

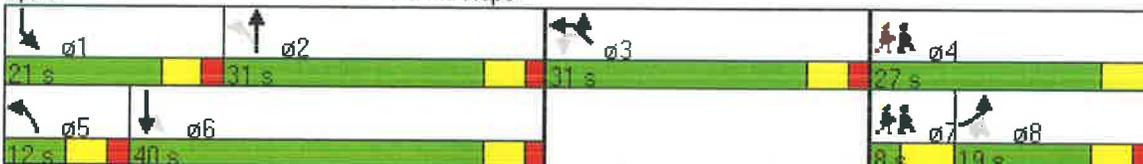


Lane Group	EBL	EBR	EBR2	NBL	NBT	SBL	SBT	NWL	NWR	ø4	ø7
Lane Configurations	↘	↗	↗	↘	↑↑	↘	↕	↘	↗		
Volume (vph)	98	156	91	120	509	340	771	171	370		
Turn Type		Perm	Perm	pm+pt		pm+pt			Prot		
Protected Phases	8			5	2	1	6	3	3	4	7
Permitted Phases		8	8	2		6					
Detector Phase	8	8	8	5	2	1	6	3	3		
Switch Phase											
Minimum Initial (s)	13.0	13.0	13.0	5.0	7.0	5.0	7.0	6.0	6.0	1.0	3.0
Minimum Split (s)	19.0	19.0	19.0	12.0	27.0	12.0	27.0	18.0	18.0	25.0	8.0
Total Split (s)	19.0	19.0	19.0	12.0	31.0	21.0	40.0	31.0	31.0	27.0	8.0
Total Split (%)	17.3%	17.3%	17.3%	10.9%	28.2%	19.1%	36.4%	28.2%	28.2%	25%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0
Lost Time Adjust (s)	-3.0	-3.0	-1.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lag				Lead
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	20.5	20.5	18.5	46.2	34.9	60.0	45.7	20.5	20.5		
Actuated g/C Ratio	0.19	0.19	0.17	0.42	0.32	0.55	0.42	0.19	0.19		
v/c Ratio	0.33	0.59	0.38	0.50	0.50	0.72	0.76	0.58	0.67		
Control Delay	40.8	48.8	44.1	19.6	37.1	32.7	45.0	46.9	10.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	40.8	48.8	44.1	19.6	37.1	32.7	45.0	46.9	10.0		
LOS	D	D	D	B	D	C	D	D	A		
Approach Delay	45.3				33.7		41.8	21.7			
Approach LOS	D				C		D	C			

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 36.6
 Intersection Capacity Utilization 68.0%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service C

Splits and Phases: 12: Crittenden Blvd & Mt. Hope



Timings
13: Elmwood Ave & Mt. Hope

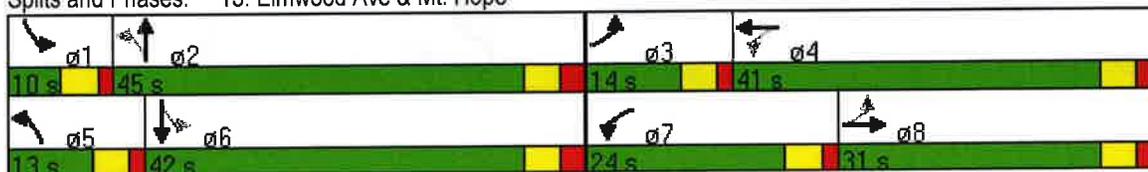


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↕	↗	↔	↘	↕	↖	↕
Volume (vph)	177	564	331	856	178	695	38	745
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	3	8	7	4	5	2	1	6
Permitted Phases	8		4		2		6	
Detector Phase	3	8	7	4	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	10.0	4.0	10.0	4.0	7.0	4.0	7.0
Minimum Split (s)	12.0	31.0	12.0	31.0	10.0	32.0	10.0	32.0
Total Split (s)	14.0	31.0	24.0	41.0	13.0	45.0	10.0	42.0
Total Split (%)	12.7%	28.2%	21.8%	37.3%	11.8%	40.9%	9.1%	38.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	39.3	28.3	51.9	37.9	52.1	46.1	45.9	39.0
Actuated g/C Ratio	0.36	0.26	0.47	0.34	0.47	0.42	0.42	0.35
v/c Ratio	0.80	0.90	0.92	0.79	0.85	0.63	0.18	0.95
Control Delay	48.8	52.3	57.6	38.2	66.0	22.4	17.8	49.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	52.3	57.6	38.2	66.0	22.4	17.8	49.3
LOS	D	D	E	D	E	C	B	D
Approach Delay		51.6		43.6		30.1		48.2
Approach LOS		D		D		C		D

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 43.3
 Intersection Capacity Utilization 93.3%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 13: Elmwood Ave & Mt. Hope



Timings
14: Lattimore & Mt. Hope

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Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	9	124	650	770
Turn Type	Perm			
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	26.0	24.0	24.0	24.0
Total Split (s)	27.0	83.0	83.0	83.0
Total Split (%)	24.5%	75.5%	75.5%	75.5%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	8.9		100.7	100.7
Actuated g/C Ratio	0.08		0.92	0.92
v/c Ratio	0.25		0.40	0.29
Control Delay	25.0		2.9	0.6
Queue Delay	0.0		0.0	0.0
Total Delay	25.0		2.9	0.6
LOS	C		A	A
Approach Delay	25.0		2.9	0.6
Approach LOS	C		A	A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.40
 Intersection Signal Delay: 2.2
 Intersection Capacity Utilization 60.2%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 14: Lattimore & Mt. Hope



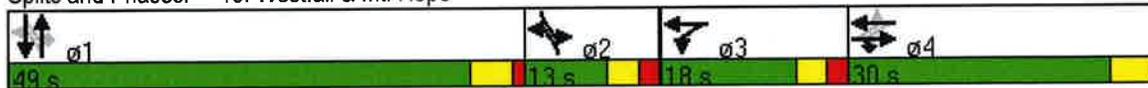
Timings
15: Westfall & Mt. Hope

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	9	121	57	191	211	85	687	432	103	634
Turn Type	Perm		custom	pm+pt		pm+pt		Perm	pm+pt	
Protected Phases		4	4	3	3 4	2	1		2	1
Permitted Phases	4		4	3 4		1		1	1	
Detector Phase	4	4	4	3	3 4	2	1	1	2	1
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	5.0		5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	29.0	29.0	29.0	11.0		13.0	40.0	40.0	13.0	40.0
Total Split (s)	30.0	30.0	30.0	18.0	48.0	13.0	49.0	49.0	13.0	49.0
Total Split (%)	27.3%	27.3%	27.3%	16.4%	43.6%	11.8%	44.5%	44.5%	11.8%	44.5%
Yellow Time (s)	4.0	4.0	4.0	3.0		3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	1.0	2.0		2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	None	None	None		None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		18.0	18.0	35.6	38.6	62.4	55.4	54.4	62.4	55.4
Actuated g/C Ratio		0.16	0.16	0.32	0.35	0.57	0.50	0.49	0.57	0.50
v/c Ratio		0.49	0.21	0.49	0.53	0.24	0.43	0.47	0.30	0.40
Control Delay		46.4	12.8	29.5	28.7	11.7	12.6	2.2	34.6	35.5
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		46.4	12.8	29.5	28.7	11.7	12.6	2.2	34.6	35.5
LOS		D	B	C	C	B	B	A	C	D
Approach Delay		36.2			29.0		8.8			35.3
Approach LOS		D			C		A			D

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 22.1
 Intersection LOS: C
 Intersection Capacity Utilization 61.8%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 15: Westfall & Mt. Hope



HCM Unsignalized Intersection Capacity Analysis
 18: Iona & E Henrietta

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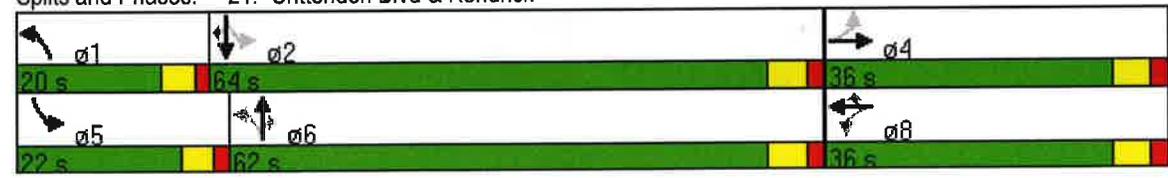
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	114	30	1808	217	106	1056
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	127	33	2009	241	118	1173
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (fl)			868			1060
pX, platoon unblocked	0.81	0.73			0.73	
vC, conflicting volume	2952	1125			2250	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2079	432			1973	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	92			44	
cM capacity (veh/h)	17	417			212	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	160	1339	911	509	782	
Volume Left	127	0	0	118	0	
Volume Right	33	0	241	0	0	
cSH	21	1700	1700	212	1700	
Volume to Capacity	7.75	0.79	0.54	0.56	0.46	
Queue Length 95th (ft)	Err	0	0	75	0	
Control Delay (s)	Err	0.0	0.0	32.6	0.0	
Lane LOS	F			D		
Approach Delay (s)	Err	0.0		12.8		
Approach LOS	F					
Intersection Summary						
Average Delay			436.7			
Intersection Capacity Utilization			107.3%	ICU Level of Service		G
Analysis Period (min)			15			

Timings
21: Crittenden Blvd & Kendrick

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	1	4	26	126	142	56	190	66	167	507	349
Turn Type	Perm		Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases		4		8		1	6		5	2	
Permitted Phases	4		8		8	6		6	2		2
Detector Phase	4	4	8	8	8	1	6	6	5	2	2
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	11.0	10.0	10.0	6.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	20.0	32.0	32.0	20.0	32.0	32.0
Total Split (s)	36.0	36.0	36.0	36.0	36.0	20.0	62.0	62.0	22.0	64.0	64.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	16.7%	51.7%	51.7%	18.3%	53.3%	53.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.5	2.0	2.0	1.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0	-1.0	-2.0	-3.0	-3.0	-2.0	-3.0	-3.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	Min	Min	Min	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	21.5	21.5		21.5	19.5	91.4	79.0	79.0	86.9	76.5	76.5
Actuated g/C Ratio	0.18	0.18		0.18	0.16	0.76	0.66	0.66	0.72	0.64	0.64
v/c Ratio	0.01	0.02		0.57	0.42	0.11	0.18	0.07	0.22	0.51	0.41
Control Delay	37.0	34.2		50.1	9.8	4.5	9.6	2.5	2.6	7.3	6.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Total Delay	37.0	34.2		50.1	9.8	4.5	9.6	2.5	2.6	7.9	6.4
LOS	D	C		D	A	A	A	A	A	A	A
Approach Delay		34.7		30.6			7.2			6.6	
Approach LOS		C		C			A			A	

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 11.1
 Intersection LOS: B
 Intersection Capacity Utilization 60.6%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings
22: ELMWOOD AVENUE & Kendrick

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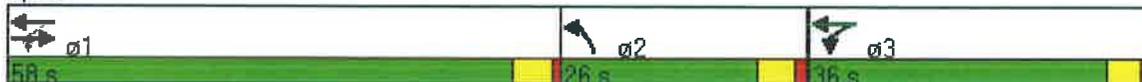


Lane Group	EBT	WBL	WBT	NBL
Lane Configurations	↑↑	↘	↑↑	↘↘
Volume (vph)	628	421	420	206
Turn Type		pm+pt		
Protected Phases	1	3	1 3	2
Permitted Phases		1 3		
Detector Phase	1	3	1 3	2
Switch Phase				
Minimum Initial (s)	15.0	4.0		10.0
Minimum Split (s)	34.0	10.0		26.0
Total Split (s)	58.0	36.0	94.0	26.0
Total Split (%)	48.3%	30.0%	78.3%	21.7%
Yellow Time (s)	4.0	3.5		4.0
All-Red Time (s)	1.0	1.5		1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lead			Lag
Lead-Lag Optimize?				
Recall Mode	C-Max	None		None
Act Effct Green (s)	61.0	92.5	95.5	18.5
Actuated g/C Ratio	0.51	0.77	0.80	0.15
v/c Ratio	0.75	0.86	0.17	0.64
Control Delay	22.9	51.0	3.1	31.2
Queue Delay	0.7	0.0	0.0	0.0
Total Delay	23.6	51.0	3.1	31.2
LOS	C	D	A	C
Approach Delay	23.6		27.1	31.2
Approach LOS	C		C	C

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 25.9
 Intersection Capacity Utilization 80.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 22: ELMWOOD AVENUE & Kendrick



HCM Unsignalized Intersection Capacity Analysis
 25: Lattimore & Kendrick

Uof R IPD
 7/9/2013

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	16	302	95	126	407
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	18	336	106	140	452
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						795
pX, platoon unblocked	0.89					
vC, conflicting volume	1121	388			441	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1072	388			441	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	97			87	
cM capacity (veh/h)	189	660			1119	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	13	18	441	140	452	
Volume Left	13	0	0	140	0	
Volume Right	0	18	106	0	0	
cSH	189	660	1700	1119	1700	
Volume to Capacity	0.07	0.03	0.26	0.13	0.27	
Queue Length 95th (ft)	6	2	0	11	0	
Control Delay (s)	25.5	10.6	0.0	8.7	0.0	
Lane LOS	D	B		A		
Approach Delay (s)	17.0		0.0	2.1		
Approach LOS	C					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			42.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 26: Lot #1 & Kendrick

Uof R IPD
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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	17	268	400	247	172
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	19	298	444	274	191
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					957	
pX, platoon unblocked	0.90	0.90	0.90			
vC, conflicting volume	1410	370	466			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1400	245	351			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	73			
cM capacity (veh/h)	101	715	1087			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	20	298	444	466		
Volume Left	1	298	0	0		
Volume Right	19	0	0	191		
cSH	535	1087	1700	1700		
Volume to Capacity	0.04	0.27	0.26	0.27		
Queue Length 95th (ft)	3	28	0	0		
Control Delay (s)	12.0	9.6	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	12.0	3.8		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			2.5			
Intersection Capacity Utilization			51.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
27: Westmoreland Rd & Kendrick

Uof R IPD
7/9/2013

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	8	1	134	1	1	18	240	528	40	95	146	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	1	149	1	1	20	267	587	44	106	162	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1536	1523	609	1669	1542	166	170			631		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1536	1523	609	1669	1542	166	170			631		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	99	70	97	99	98	81			89		
cM capacity (veh/h)	72	85	495	42	83	878	1407			951		
Direction, Lane #	NB 1	NB 2	SB 1	NE 1	SW 1	SW 2						
Volume Total	10	149	22	898	106	170						
Volume Left	9	0	1	267	106	0						
Volume Right	0	149	20	44	0	8						
cSH	73	495	353	1407	951	1700						
Volume to Capacity	0.14	0.30	0.06	0.19	0.11	0.10						
Queue Length 95th (ft)	11	31	5	17	9	0						
Control Delay (s)	61.9	15.4	15.9	4.1	9.3	0.0						
Lane LOS	F	C	C	A	A							
Approach Delay (s)	18.3		15.9	4.1	3.5							
Approach LOS	C		C									
Intersection Summary												
Average Delay			5.9									
Intersection Capacity Utilization			65.5%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 91: Elmwood Ave & East Dr

Uof R IPD
 7/9/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Volume (veh/h)	711	62	237	1064	72	151
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	790	69	263	1182	80	168
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (fl)	547			871		
pX, platoon unblocked				0.87	0.87	0.87
vC, conflicting volume				859	1942	429
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				526	1085	30
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				71	38	81
cM capacity (veh/h)				897	130	898

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	527	332	263	591	591	80	168
Volume Left	0	0	263	0	0	80	0
Volume Right	0	69	0	0	0	0	168
cSH	1700	1700	897	1700	1700	130	898
Volume to Capacity	0.31	0.20	0.29	0.35	0.35	0.62	0.19
Queue Length 95th (ft)	0	0	31	0	0	80	17
Control Delay (s)	0.0	0.0	10.7	0.0	0.0	69.7	9.9
Lane LOS	B			F			
Approach Delay (s)	0.0		1.9			29.2	
Approach LOS						D	

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
109: Kendrick &

Uof R IPD
7/9/2013



Movement	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations			↙	↑	↑	↗
Volume (veh/h)	0	0	65	810	175	32
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	72	900	194	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1239	194	230			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1239	194	230			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	95			
cM capacity (veh/h)	183	847	1338			

Direction, Lane #	NE 1	NE 2	SW 1	SW 2
Volume Total	72	900	194	36
Volume Left	72	0	0	0
Volume Right	0	0	0	36
cSH	1338	1700	1700	1700
Volume to Capacity	0.05	0.53	0.11	0.02
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	7.8	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.6		0.0	
Approach LOS				

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		46.0%	ICU Level of Service A
Analysis Period (min)		15	



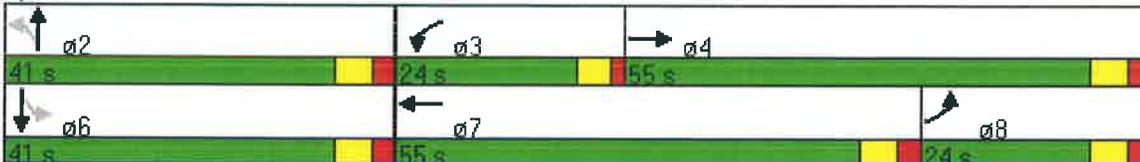
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	180	486	197	1112	4	525	41	400
Turn Type	custom		Prot		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	8				2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	24.0	55.0	24.0	55.0	41.0	41.0	41.0	41.0
Total Split (%)	20.0%	45.8%	20.0%	45.8%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?								
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	21.4	53.1	19.9	51.6		38.0		38.0
Actuated g/C Ratio	0.18	0.44	0.17	0.43		0.32		0.32
v/c Ratio	0.63	0.37	0.75	0.85		0.69		0.84
Control Delay	55.9	23.1	63.8	36.9		25.3		46.1
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	55.9	23.1	63.8	36.9		25.3		46.1
LOS	E	C	E	D		C		D
Approach Delay		31.6		40.8		25.3		46.1
Approach LOS		C		D		C		D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 36.8
 Intersection Capacity Utilization 92.1%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 162: ELMWOOD AVENUE & South



Timings
222: I-390 NB & E Henrietta



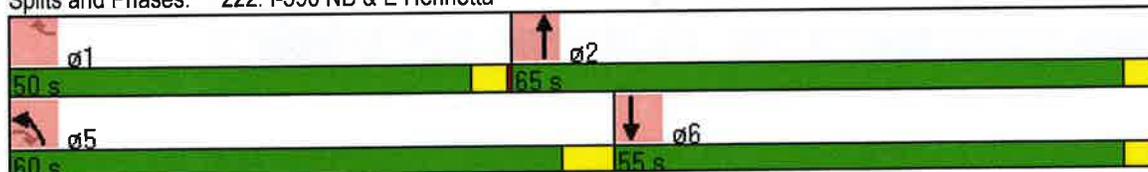
Lane Group	EBR	WBR	NBL	NBT	SBT	SBR
Lane Configurations	↗	↗↗	↗↗	↑↑	↑↑	↗
Volume (vph)	579	844	214	1181	1143	78
Turn Type	custom	custom	Prot			Free
Protected Phases			5	2	6	
Permitted Phases	5	1				Free
Detector Phase	5	1	5	2	6	
Switch Phase						
Minimum Initial (s)	3.0	4.0	3.0	4.0	4.0	
Minimum Split (s)	25.0	20.0	25.0	20.0	20.0	
Total Split (s)	60.0	50.0	60.0	65.0	55.0	0.0
Total Split (%)	52.2%	43.5%	52.2%	56.5%	47.8%	0.0%
Yellow Time (s)	5.0	3.5	5.0	3.5	3.5	
All-Red Time (s)	0.0	0.5	0.0	0.5	0.5	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	3.0	4.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	C-Max	C-Max	
Act Effect Green (s)	51.0	42.9	51.0	66.1	57.0	115.0
Actuated g/C Ratio	0.44	0.37	0.44	0.57	0.50	1.00
v/c Ratio	0.88	0.86	0.16	0.64	0.72	0.05
Control Delay	42.7	39.7	26.6	9.0	26.9	0.1
Queue Delay	35.8	0.0	0.7	11.6	0.5	0.0
Total Delay	78.5	39.7	27.3	20.6	27.4	0.1
LOS	E	D	C	C	C	A
Approach Delay				21.6	25.6	
Approach LOS				C	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 34.7
 Intersection Capacity Utilization 74.1%
 Analysis Period (min) 15
 Description: Counts from NYSDOT 3/17/2005

Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 222: I-390 NB & E Henrietta



Timings

393: ELMWOOD AVENUE & U of R

Uof R IPD

7/9/2013



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑
Volume (vph)	747	54	804	36	26
Turn Type		pm+pt			Perm
Protected Phases	1	3	1 3	2	
Permitted Phases		1 3			2
Detector Phase	1	3	1 3	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	72.0	15.0	87.0	33.0	33.0
Total Split (%)	60.0%	12.5%	72.5%	27.5%	27.5%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effect Green (s)	69.0	81.0	84.0	30.0	30.0
Actuated g/C Ratio	0.58	0.68	0.70	0.25	0.25
v/c Ratio	0.43	0.13	0.36	0.09	0.07
Control Delay	15.0	6.3	7.7	35.4	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	6.3	7.7	35.4	12.2
LOS	B	A	A	D	B
Approach Delay	15.0		7.6	25.6	
Approach LOS	B		A	C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.43
 Intersection Signal Delay: 11.7
 Intersection Capacity Utilization 40.2%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 393: ELMWOOD AVENUE & U of R



Timings
395: Crittenden Blvd & East Dr

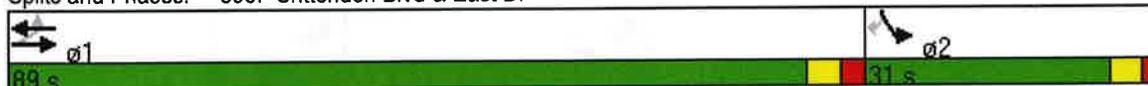


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↖	↗↗	↖↗	↖	↗
Volume (vph)	68	274	497	74	88
Turn Type	Perm				Perm
Protected Phases		1	1	2	
Permitted Phases	1				2
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	15.0	15.0
Total Split (s)	89.0	89.0	89.0	31.0	31.0
Total Split (%)	74.2%	74.2%	74.2%	25.8%	25.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effect Green (s)	99.6	99.6	99.6	14.4	14.4
Actuated g/C Ratio	0.83	0.83	0.83	0.12	0.12
v/c Ratio	0.13	0.10	0.25	0.39	0.36
Control Delay	3.1	2.3	2.3	53.3	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	2.3	2.3	53.3	12.6
LOS	A	A	A	D	B
Approach Delay		2.5	2.3	31.1	
Approach LOS		A	A	C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 6.4
 Intersection Capacity Utilization 39.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr



Timings
470: MCH & E Henrietta



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	25	1	61	2	166	1574	41	1095
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	14.0	39.0	14.0	39.0
Total Split (s)	32.0	32.0	32.0	32.0	14.0	74.0	14.0	74.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	11.7%	61.7%	11.7%	61.7%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	13.5	13.5	13.5	13.5	97.5	86.4	97.5	86.4
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.81	0.72	0.81	0.72
v/c Ratio	0.45	0.08	0.44	0.63	0.47	0.74	0.18	0.52
Control Delay	71.1	21.5	57.2	24.1	6.4	13.6	7.0	1.8
Queue Delay	0.2	0.0	0.0	0.1	0.0	0.1	0.0	0.3
Total Delay	71.3	21.5	57.2	24.2	6.4	13.7	7.0	2.1
LOS	E	C	E	C	A	B	A	A
Approach Delay		53.9		32.9		13.0		2.3
Approach LOS		D		C		B		A

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 10.9
 Intersection Capacity Utilization 79.0%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 470: MCH & E Henrietta



Timings
500: Crittenden & E Henrietta

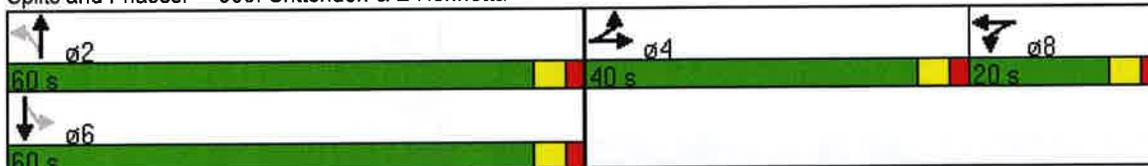


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↔	↔	↖	↕	↖	↕
Volume (vph)	333	9	1	48	815	27	1390
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	40.0	40.0	20.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	16.7%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	25.7	25.7	8.0	83.9	83.9	83.9	83.9
Actuated g/C Ratio	0.21	0.21	0.07	0.70	0.70	0.70	0.70
v/c Ratio	0.69	0.64	0.05	0.82	0.37	0.09	1.12
Control Delay	53.0	43.6	0.3	94.7	9.3	9.8	77.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	43.8
Total Delay	53.0	43.6	0.3	94.7	9.3	9.8	121.5
LOS	D	D	A	F	A	A	F
Approach Delay		48.4	0.3		14.0		120.2
Approach LOS		D	A		B		F

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 105 (88%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 86.8
 Intersection Capacity Utilization 96.2%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service F

Splits and Phases: 500: Crittenden & E Henrietta



Timings
501: Southland Drive & West Henrietta Road

Uof R IPD
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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔	↔	↔	↔	↔
Volume (vph)	34	1	7	1	1	1065	72	1397
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	74.0	74.0	14.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	67.3%	67.3%	12.7%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.5		10.5	87.0	87.0	95.6	96.2
Actuated g/C Ratio		0.10		0.10	0.79	0.79	0.87	0.87
v/c Ratio		0.30		0.15	0.00	0.43	0.19	0.51
Control Delay		45.5		27.2	3.0	8.2	3.7	6.3
Queue Delay		0.0		0.0	0.0	0.1	0.0	0.2
Total Delay		45.5		27.2	3.0	8.3	3.7	6.5
LOS		D		C	A	A	A	A
Approach Delay		45.5		27.2		8.3		6.4
Approach LOS		D		C		A		A

Intersection Summary

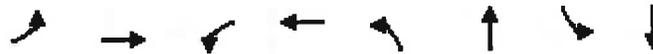
Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 7.9
 Intersection Capacity Utilization 57.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 501: Southland Drive & West Henrietta Road



Timings
502: Doncaster Road & West Henrietta Road

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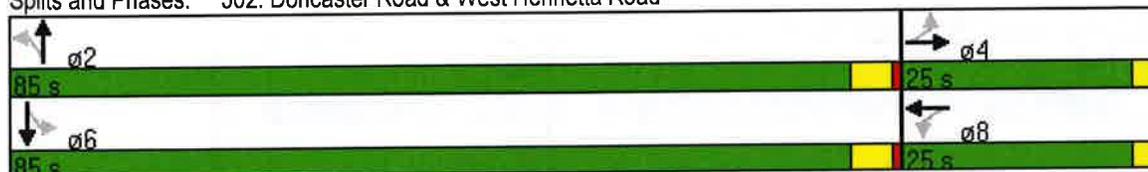


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Volume (vph)	10	1	3	2	1	1071	10	1394
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		6.4		6.4		104.6		104.6
Actuated g/C Ratio		0.06		0.06		0.95		0.95
v/c Ratio		0.12		0.14		0.37		0.49
Control Delay		48.3		33.9		2.5		2.8
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		48.3		33.9		2.5		2.8
LOS		D		C		A		A
Approach Delay		48.3		33.9		2.5		2.8
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 75 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 3.1
 Intersection Capacity Utilization 55.7%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 502: Doncaster Road & West Henrietta Road



Timings
503: Crittenden & West Henrietta Road

Uof R IPD
7/9/2013

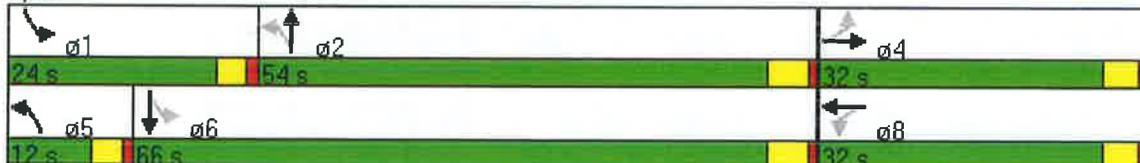


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕↕		↕↕	↖	↕↕	↖	↕↕
Volume (vph)	102	170	208	40	23	741	328	1046
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	9.0	25.0	8.0	25.0
Total Split (s)	32.0	32.0	32.0	32.0	12.0	54.0	24.0	66.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	10.9%	49.1%	21.8%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)		25.5		25.5	65.4	58.4	78.5	72.3
Actuated g/C Ratio		0.23		0.23	0.59	0.53	0.71	0.66
v/c Ratio		0.94dl		0.86	0.08	0.53	0.77	0.51
Control Delay		51.6		38.6	9.3	30.2	25.2	14.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		51.6		38.6	9.3	30.2	25.2	14.6
LOS		D		D	A	C	C	B
Approach Delay		51.6		38.6		29.6		17.1
Approach LOS		D		D		C		B

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 27.8
 Intersection Capacity Utilization 80.9%
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 503: Crittenden & West Henrietta Road



Timings
504: BHTL & West Henrietta Road

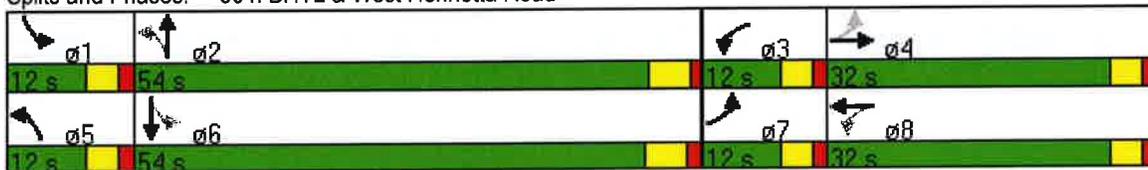


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗	↖	↗
Volume (vph)	148	333	121	299	36	664	205	909
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	12.0	32.0	12.0	32.0	12.0	54.0	12.0	54.0
Total Split (%)	10.9%	29.1%	10.9%	29.1%	10.9%	49.1%	10.9%	49.1%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	29.2	20.2	29.2	20.2	64.2	56.2	71.8	64.9
Actuated g/C Ratio	0.27	0.18	0.27	0.18	0.58	0.51	0.65	0.59
v/c Ratio	0.72	0.60	0.54	0.66	0.14	0.53	0.57	0.61
Control Delay	48.6	44.2	37.7	42.9	9.3	19.3	24.2	26.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	44.2	37.7	42.9	9.3	19.3	24.2	26.9
LOS	D	D	D	D	A	B	C	C
Approach Delay		45.5		41.6		18.9		26.5
Approach LOS		D		D		B		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 29.7
 Intersection LOS: C
 Intersection Capacity Utilization 68.4%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 504: BHTL & West Henrietta Road



HCM Unsignalized Intersection Capacity Analysis
 505: Crittenden & East River Road

Uof R IPD
 7/9/2013



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	58	8	372	113	2	148
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	64	9	413	126	2	164
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	645	476			539	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	645	476			539	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	98			100	
cM capacity (veh/h)	435	589			1029	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	73	539	167
Volume Left	64	0	2
Volume Right	9	126	0
cSH	450	1700	1029
Volume to Capacity	0.16	0.32	0.00
Queue Length 95th (ft)	14	0	0
Control Delay (s)	14.6	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	14.6	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		36.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
506: East River Road & Site Drive

Uof R IPD
7/9/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Volume (veh/h)	1202	20	30	591	30	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1336	22	33	657	33	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	615			1205		
pX, platoon unblocked				0.94		
vC, conflicting volume				1358	1742	679
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				1358	1662	679
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				93	57	94
cM capacity (veh/h)				502	77	394

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	890	467	252	438	33	22
Volume Left	0	0	33	0	33	0
Volume Right	0	22	0	0	0	22
cSH	1700	1700	502	1700	77	394
Volume to Capacity	0.52	0.27	0.07	0.26	0.43	0.06
Queue Length 95th (ft)	0	0	5	0	43	4
Control Delay (s)	0.0	0.0	2.5	0.0	83.1	14.7
Lane LOS	A			F B		
Approach Delay (s)	0.0		0.9		55.7	
Approach LOS					F	

Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			48.6%		ICU Level of Service	A
Analysis Period (min)			15			

Intersection								
Intersection Delay (sec/veh)	3.2							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		1		2	
Conflicting Circle Lanes	2		2		2		2	
Adjusted Approach Flow (vph)	332		1077		95		210	
Demand Flow Rate (pc/h)	339		1099		97		214	
Vehicles Circulating (pc/h)	182		241		451		307	
Vehicles Exiting (pc/h)	339		307		70		231	
Follow-Up Headway (s)	3.186		3.186		3.186		3.186	
Ped Vol. Crossing Leg (#/hr)	0		0		0		0	
Ped Capacity Adjustment	1.000		1.000		1.000		1.000	
Approach Delay (sec/veh)	5.4		2.0		5.6		5.4	
Approach LOS	A		A		A		A	
Lane	Left	Right	Left	Bypass	Left	Left	Right	
Designated moves	LT	TR	LT	R	LTR	LT	R	
Assumed Moves	L	TR	LT	R	LTR	LT	R	
Right Turn Channelized	Free							
Lane Utilization	0.563	0.437	1.000		1.000	0.668	0.332	
Critical Headway (s)	4.293	4.113	4.293		4.113	4.293	4.113	
Entry Flow Rate (pc/h)	191	148	297	802	97	143	71	
Capacity, Entry Lane (pc/h)	986	995	943	1938	824	898	911	
Entry HV Adjustment Factor	0.979	0.983	0.980	0.980	0.982	0.977	0.986	
Flow Rate, Entry (vph)	187	145	291	786	95	140	70	
Capacity, Entry (vph)	965	978	924	1900	809	877	899	
Volume to Capacity Ratio	0.194	0.149	0.315	0.414	0.118	0.159	0.078	
Control Delay (sec/veh)	5.6	5.1	7.3	0.0	5.6	5.7	4.7	
Level of Service	A	A	A	A	A	A	A	
95th-Percentile Queue (veh)	1	1	1	2	0	1	0	

PM Peak Hour

Background Conditions 5-Year

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HCM Unsignalized Intersection Capacity Analysis
 1: East River Road & Kendrick

Uof R IPD
 7/11/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized						Yes						
Volume (veh/h)	78	96	60	28	112	169	14	19	60	378	26	151
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	87	107	67	31	124	188	16	21	67	420	29	168
Approach Volume (veh/h)		260			156			103			617	
Crossing Volume (veh/h)		480			123			613			171	
High Capacity (veh/h)		948			1258			852			1211	
High v/c (veh/h)		0.27			0.12			0.12			0.51	
Low Capacity (veh/h)		768			1046			683			1004	
Low v/c (veh/h)		0.34			0.15			0.15			0.61	
Intersection Summary												
Maximum v/c High			0.51									
Maximum v/c Low			0.61									
Intersection Capacity Utilization		53.8%			ICU Level of Service				A			

Timings
2: East River Road & I-390 S On Ramp

Uof R IPD
7/11/2013



Lane Group	EBL	EBT	WBT	SEL	SER
Lane Configurations	↖	↕	↕	↖	↗
Volume (vph)	312	222	231	534	78
Turn Type	Perm				Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	20.0	20.0	20.0	10.0	10.0
Total Split (s)	64.0	64.0	64.0	26.0	26.0
Total Split (%)	71.1%	71.1%	71.1%	28.9%	28.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	-2.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	3.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effect Green (s)	27.3	27.3	27.3	17.1	14.8
Actuated g/C Ratio	0.51	0.51	0.51	0.32	0.28
v/c Ratio	0.75	0.14	0.29	0.54	0.17
Control Delay	21.7	6.7	7.5	19.1	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	6.7	7.5	19.1	6.6
LOS	C	A	A	B	A
Approach Delay		15.4	7.5	17.5	
Approach LOS		B	A	B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 53.2
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 14.0
 Intersection Capacity Utilization 57.2%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 2: East River Road & I-390 S On Ramp



Intersection Sign configuration not allowed in HCM analysis.

Timings

6: East River Road & West Henrietta Road

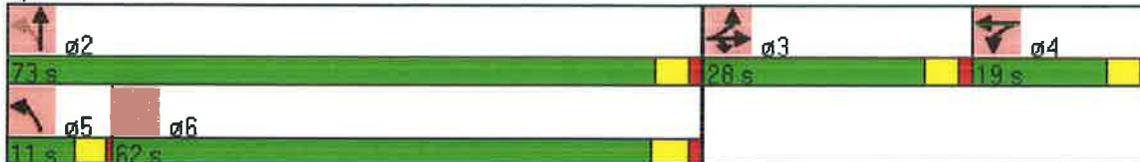


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Configurations								
Volume (vph)	207	243	334	112	100	77	1348	877
Turn Type	Split		Prot	Split		pm+pt		
Protected Phases	3	3	3	4	4	5	2	6
Permitted Phases						2		
Detector Phase	3	3	3	4	4	5	2	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	15.0	15.0	8.0	29.0	25.5
Total Split (s)	28.0	28.0	28.0	19.0	19.0	11.0	73.0	62.0
Total Split (%)	23.3%	23.3%	23.3%	15.8%	15.8%	9.2%	60.8%	51.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	0.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead		Lag
Lead-Lag Optimize?						Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max
Act Effct Green (s)	22.7	22.7	22.7	14.3	14.3	74.9	73.9	65.1
Actuated g/C Ratio	0.19	0.19	0.19	0.12	0.12	0.62	0.62	0.54
v/c Ratio	0.68	0.73	0.47	0.58	0.32	0.35	0.60	0.68
Control Delay	56.7	46.8	9.1	61.3	42.7	13.9	14.9	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.7	46.8	9.1	61.3	42.7	13.9	14.9	25.4
LOS	E	D	A	E	D	B	B	C
Approach Delay		40.1			51.5		14.9	25.4
Approach LOS		D			D		B	C

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 25.3
 Intersection Capacity Utilization 67.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 6: East River Road & West Henrietta Road



Timings
8: I-390 SB Ramp & E Henrietta

Uof R IPD
7/10/2013

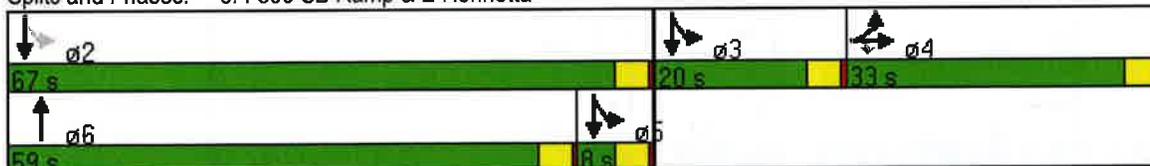


Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	ø2	ø3	ø5
Lane Configurations	↙	↕	↘	↑↑	↗	↙↘	↑↑			
Volume (vph)	222	436	494	1343	789	398	1274			
Turn Type	Split		Perm		Free	pm+pt				
Protected Phases	4	4		6		3 5	2 3 5	2	3	5
Permitted Phases			4		Free	2 3 5				
Detector Phase	4	4	4	6		3 5	2 3 5			
Switch Phase										
Minimum Initial (s)	3.0	3.0	3.0	4.0				4.0	4.0	3.0
Minimum Split (s)	25.0	25.0	25.0	20.0				20.0	20.0	8.0
Total Split (s)	33.0	33.0	33.0	59.0	0.0	28.0	95.0	67.0	20.0	8.0
Total Split (%)	27.5%	27.5%	27.5%	49.2%	0.0%	23.3%	79.2%	56%	17%	7%
Yellow Time (s)	3.5	3.5	3.5	3.5				3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5				0.5	0.5	0.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0			
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lead/Lag	Lag	Lag	Lag	Lead					Lead	Lag
Lead-Lag Optimize?				Yes						Yes
Recall Mode	None	None	None	C-Max				C-Max	None	Min
Act Effct Green (s)	29.7	29.7	29.7	56.9	120.0	84.3	84.3			
Actuated g/C Ratio	0.25	0.25	0.25	0.47	1.00	0.70	0.70			
v/c Ratio	0.56	0.93	0.80	0.89	0.55	0.54	0.57			
Control Delay	45.5	60.1	48.1	36.2	0.7	28.9	2.6			
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0	0.7			
Total Delay	45.5	60.1	48.1	36.7	0.7	28.9	3.3			
LOS	D	E	D	D	A	C	A			
Approach Delay		54.5		23.4			9.4			
Approach LOS		D		C			A			

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 116 (97%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 25.9
 Intersection Capacity Utilization 74.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 8: I-390 SB Ramp & E Henrietta



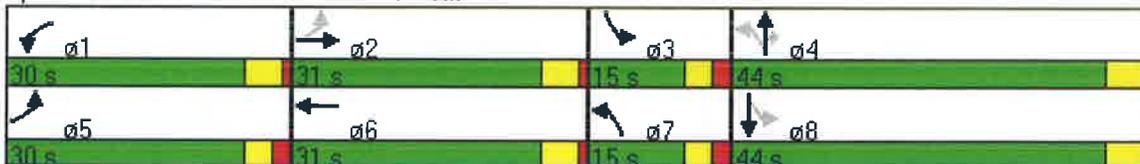
Timings
10: Westfall & E Henrietta

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	129	348	395	319	148	981	232	246	1158
Turn Type	pm+pt		Prot		pm+pt		Perm	pm+pt	
Protected Phases	5	2	1	6	7	4		3	8
Permitted Phases	2				4		4	8	
Detector Phase	5	2	1	6	7	4	4	3	8
Switch Phase									
Minimum Initial (s)	5.0	7.0	10.0	7.0	5.0	10.0	10.0	5.0	7.0
Minimum Split (s)	10.0	30.0	29.0	30.0	10.0	29.0	29.0	10.0	30.0
Total Split (s)	30.0	31.0	30.0	31.0	15.0	44.0	44.0	15.0	44.0
Total Split (%)	25.0%	25.8%	25.0%	25.8%	12.5%	36.7%	36.7%	12.5%	36.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	Max
Act Effect Green (s)	55.0	28.0	27.0	28.0	53.0	41.0	40.0	53.0	41.0
Actuated g/C Ratio	0.46	0.23	0.22	0.23	0.44	0.34	0.33	0.44	0.34
v/c Ratio	0.29	0.68	1.10	0.65	0.68	0.90	0.38	1.14	1.14
Control Delay	22.2	42.1	119.4	39.1	53.8	30.2	4.2	126.7	100.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	10.5	0.0	0.0	0.0
Total Delay	22.2	42.1	119.4	39.1	53.8	40.7	4.2	126.7	100.6
LOS	C	D	F	D	D	D	A	F	F
Approach Delay		38.1		74.7		35.9			104.9
Approach LOS		D		E		D			F

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 32 (27%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 67.5
 Intersection Capacity Utilization 92.5%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service F

Splits and Phases: 10: Westfall & E Henrietta



Timings

11: South & E Henrietta

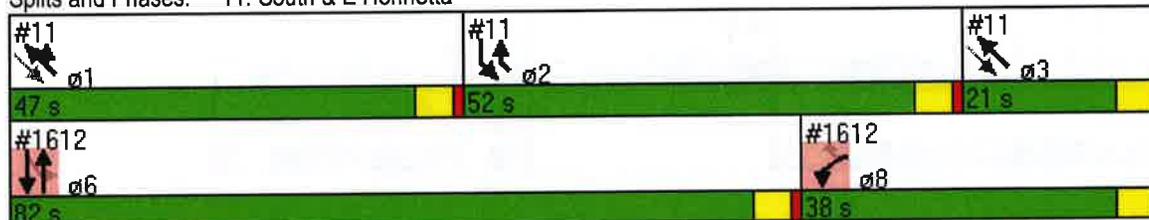
Lane Group	SBL	SET	NWT	NWR	ø1	ø3	ø6	ø8
Lane Configurations								
Volume (vph)	816	585	615	645				
Turn Type				custom				
Protected Phases	2		13	12	1	3	6	8
Permitted Phases		13		1				
Detector Phase	2	13	13	12				
Switch Phase								
Minimum Initial (s)	10.0				24.0	6.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	33.0	13.0
Total Split (s)	52.0	68.0	68.0	99.0	47.0	21.0	82.0	38.0
Total Split (%)	43.3%	56.7%	56.7%	82.5%	39%	18%	68%	32%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0				
Total Lost Time (s)	3.0	3.0	3.0	3.0				
Lead/Lag	Lag				Lead			
Lead-Lag Optimize?								
Recall Mode	None				C-Max	None	C-Max	None
Act Effect Green (s)	43.5	70.5	70.5	91.9				
Actuated g/C Ratio	0.36	0.59	0.59	0.77				
v/c Ratio	0.73	0.34	0.62	0.52				
Control Delay	29.5	23.9	6.9	8.9				
Queue Delay	1.8	0.0	0.6	0.5				
Total Delay	31.3	23.9	7.4	9.4				
LOS	C	C	A	A				
Approach Delay	31.3	23.9	8.4					
Approach LOS	C	C	A					

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 112 (93%), Referenced to phase 1:NWSE and 6:, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 18.9
 Intersection Capacity Utilization 62.3%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 11: South & E Henrietta



Timings
12: Crittenden Blvd & Mt. Hope

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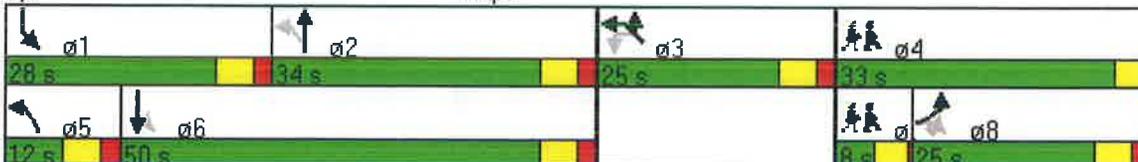


Lane Group	EBL	EBR	EBR2	NBL	NBT	SBL	SBT	NWL2	NWL	NWR	ø4	ø7
Lane Configurations												
Volume (vph)	206	236	154	87	757	394	842	8	91	414		
Turn Type		Perm	Perm	pm+pt		pm+pt		Perm		Prot		
Protected Phases	8			5	2	1	6		3	3	4	7
Permitted Phases		8	8	2		6		3				
Detector Phase	8	8	8	5	2	1	6	3	3	3		
Switch Phase												
Minimum Initial (s)	13.0	13.0	13.0	5.0	7.0	5.0	7.0	6.0	6.0	6.0	5.0	3.0
Minimum Split (s)	19.0	19.0	19.0	12.0	27.0	12.0	27.0	18.0	18.0	18.0	27.0	8.0
Total Split (s)	25.0	25.0	25.0	12.0	34.0	28.0	50.0	25.0	25.0	25.0	33.0	8.0
Total Split (%)	20.8%	20.8%	20.8%	10.0%	28.3%	23.3%	41.7%	20.8%	20.8%	20.8%	28%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.5	0.5
Lost Time Adjust (s)	-3.0	-3.0	-1.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lag					Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	C-Max	None	C-Max	None	None	None	None	None
Act Effct Green (s)	27.9	27.9	25.9	41.6	32.2	62.7	50.3		20.4	20.4		
Actuated g/C Ratio	0.23	0.23	0.22	0.35	0.27	0.52	0.42		0.17	0.17		
v/c Ratio	0.56	0.71	0.50	0.39	0.89	0.94	0.68		0.82	0.77		
Control Delay	41.8	49.0	46.7	18.9	39.0	35.7	23.6		73.6	33.5		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		
Total Delay	41.8	49.0	46.7	18.9	39.0	35.7	23.6		73.6	33.5		
LOS	D	D	D	B	D	D	C		E	C		
Approach Delay	45.9				37.0		27.3		41.2			
Approach LOS	D				D		C		D			

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 32 (27%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 35.4
 Intersection Capacity Utilization 73.0%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service C

Splits and Phases: 12: Crittenden Blvd & Mt. Hope



Timings
13: Elmwood Ave & Mt. Hope

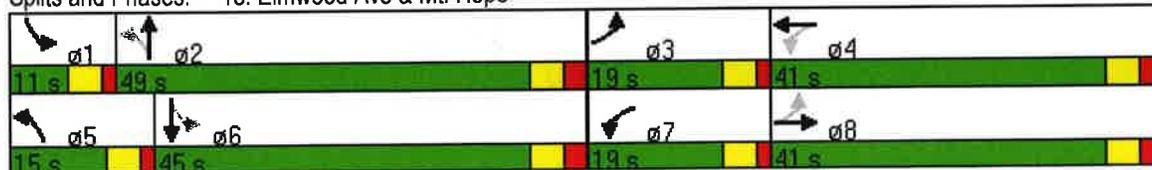


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↙	↕	↙	↕	↙	↕	↙	↕
Volume (vph)	367	875	225	543	149	842	78	882
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	3	8	7	4	5	2	1	6
Permitted Phases	8		4		2		6	
Detector Phase	3	8	7	4	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	10.0	4.0	10.0	4.0	7.0	4.0	7.0
Minimum Split (s)	12.0	31.0	12.0	31.0	10.0	32.0	10.0	32.0
Total Split (s)	19.0	41.0	19.0	41.0	15.0	49.0	11.0	45.0
Total Split (%)	15.8%	34.2%	15.8%	34.2%	12.5%	40.8%	9.2%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	54.3	38.3	53.7	38.0	56.9	46.2	50.4	42.6
Actuated g/C Ratio	0.45	0.32	0.45	0.32	0.47	0.38	0.42	0.36
v/c Ratio	1.08	1.06	0.84	0.57	0.72	1.02	0.49	0.95
Control Delay	109.3	83.8	78.8	14.9	25.2	50.4	27.5	54.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.3	83.8	78.8	14.9	25.2	50.4	27.5	54.4
LOS	F	F	E	B	C	D	C	D
Approach Delay		90.4		33.0		47.7		52.6
Approach LOS		F		C		D		D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 86 (72%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.08
 Intersection Signal Delay: 59.3
 Intersection Capacity Utilization 95.9%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service F

Splits and Phases: 13: Elmwood Ave & Mt. Hope



Timings

14: Lattimore & Mt. Hope



Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	102	35	767	1080
Turn Type	Perm			
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	27.0	24.0	24.0	24.0
Total Split (s)	30.0	90.0	90.0	90.0
Total Split (%)	25.0%	75.0%	75.0%	75.0%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	C-Max	C-Max	C-Max
Act Effect Green (s)	21.6		92.4	92.4
Actuated g/C Ratio	0.18		0.77	0.77
v/c Ratio	0.74		0.39	0.45
Control Delay	45.2		6.7	1.1
Queue Delay	0.0		0.0	0.0
Total Delay	45.2		6.7	1.1
LOS	D		A	A
Approach Delay	45.2		6.7	1.1
Approach LOS	D		A	A

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 8.0
 Intersection Capacity Utilization 67.1%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 14: Lattimore & Mt. Hope



Timings
15: Westfall & Mt. Hope

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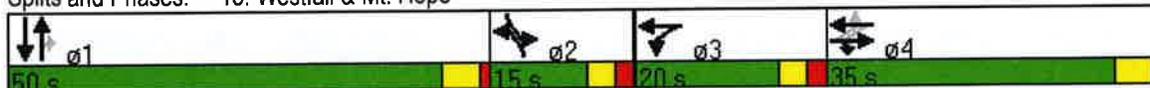


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↗	↘	↖	↗	↖	↖	↗	↖
Volume (vph)	10	151	233	445	116	66	683	207	108	1076
Turn Type	Perm		custom	pm+pt		custom		Perm	custom	
Protected Phases		4	4	3	3 4	2	1		2	1
Permitted Phases	4		4	3 4		2		1	2	
Detector Phase	4	4	4	3	3 4	2	1	1	2	1
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	5.0		5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	29.0	29.0	29.0	11.0		13.0	40.0	40.0	13.0	40.0
Total Split (s)	35.0	35.0	35.0	20.0	55.0	15.0	50.0	50.0	15.0	50.0
Total Split (%)	29.2%	29.2%	29.2%	16.7%	45.8%	12.5%	41.7%	41.7%	12.5%	41.7%
Yellow Time (s)	4.0	4.0	4.0	3.0		3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	1.0	2.0		2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	None	None	None		None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		21.7	21.7	39.2	42.2	11.5	57.3	56.3	11.5	57.3
Actuated g/C Ratio		0.18	0.18	0.33	0.35	0.10	0.48	0.47	0.10	0.48
v/c Ratio		0.55	0.60	1.25	0.39	0.43	0.45	0.27	0.71	0.71
Control Delay		49.9	19.9	171.0	40.1	56.7	34.6	14.3	67.4	16.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		49.9	19.9	171.0	40.1	56.7	34.6	14.3	67.4	16.6
LOS		D	B	F	D	E	C	B	E	B
Approach Delay		32.1			126.9		31.7			21.2
Approach LOS		C			F		C			C

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 82 (68%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.25
 Intersection Signal Delay: 47.7
 Intersection Capacity Utilization 80.6%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 15: Westfall & Mt. Hope



HCM Unsignalized Intersection Capacity Analysis
18: Iola Circle & E Henrietta

Uof R IPD
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	194	221	1186	179	160	1645
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	216	246	1318	199	178	1828
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)			768			1062
pX, platoon unblocked	0.53	0.95			0.95	
vC, conflicting volume	2687	758			1517	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2028	652			1447	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	37			60	
cM capacity (veh/h)	16	392			443	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	461	879	638	787	1219	
Volume Left	216	0	0	178	0	
Volume Right	246	0	199	0	0	
cSH	32	1700	1700	443	1700	
Volume to Capacity	14.20	0.52	0.38	0.40	0.72	
Queue Length 95th (ft)	Err	0	0	47	0	
Control Delay (s)	Err	0.0	0.0	13.1	0.0	
Lane LOS	F			B		
Approach Delay (s)	Err	0.0		5.1		
Approach LOS	F					
Intersection Summary						
Average Delay			1160.1			
Intersection Capacity Utilization			122.9%	ICU Level of Service	H	
Analysis Period (min)			15			

Timings
21: Crittenden Blvd & Kendrick

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7/10/2013

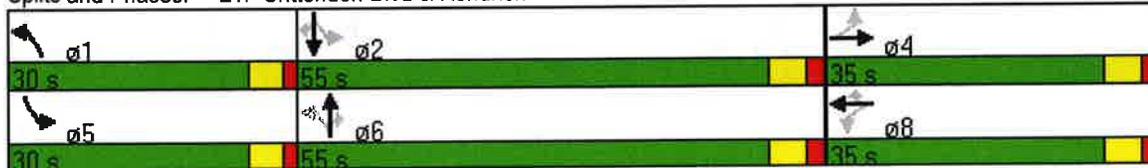


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	74	182	32	31	293	15	651	61	173	367	10
Turn Type	Perm		Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases		4		8		1	6		5	2	
Permitted Phases	4		8		8	6		6	2		2
Detector Phase	4	4	8	8	8	1	6	6	5	2	2
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	11.0	10.0	10.0	6.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	20.0	32.0	32.0	20.0	32.0	32.0
Total Split (s)	35.0	35.0	35.0	35.0	35.0	30.0	55.0	55.0	30.0	55.0	55.0
Total Split (%)	29.2%	29.2%	29.2%	29.2%	29.2%	25.0%	45.8%	45.8%	25.0%	45.8%	45.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.5	2.0	2.0	1.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0	-1.0	-2.0	-3.0	-3.0	-2.0	-3.0	-3.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	Min	Min	Min	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	25.2	25.2		25.2	23.2	83.8	71.2	71.2	85.9	72.8	72.8
Actuated g/C Ratio	0.21	0.21		0.21	0.19	0.70	0.59	0.59	0.72	0.61	0.61
v/c Ratio	0.33	0.65		0.31	0.59	0.03	0.70	0.08	0.45	0.39	0.01
Control Delay	42.3	49.9		45.3	12.8	5.8	24.3	8.7	13.5	4.4	3.6
Queue Delay	0.3	0.0		0.0	0.5	0.0	0.0	0.0	0.0	0.2	0.0
Total Delay	42.6	49.9		45.3	13.3	5.8	24.3	8.7	13.5	4.6	3.6
LOS	D	D		D	B	A	C	A	B	A	A
Approach Delay		48.0		18.9			22.6			7.4	
Approach LOS		D		B			C			A	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 115 (96%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 21.3
 Intersection Capacity Utilization 76.9%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings
22: ELMWOOD AVENUE & Kendrick

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Lane Group	EBT	WBL	WBT	NBL
Lane Configurations	↑↑	↵	↑↑	↵↵
Volume (vph)	595	76	818	614
Turn Type		pm+pt		
Protected Phases	1	3	1 3	2
Permitted Phases		1 3		
Detector Phase	1	3	1 3	2
Switch Phase				
Minimum Initial (s)	15.0	4.0		10.0
Minimum Split (s)	34.0	10.0		26.0
Total Split (s)	60.0	15.0	75.0	45.0
Total Split (%)	50.0%	12.5%	62.5%	37.5%
Yellow Time (s)	4.0	3.5		4.0
All-Red Time (s)	1.0	1.5		1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lead			Lag
Lead-Lag Optimize?				
Recall Mode	C-Max	None		None
Act Effect Green (s)	57.0	69.4	72.4	41.6
Actuated g/C Ratio	0.48	0.58	0.60	0.35
v/c Ratio	0.70	0.30	0.43	0.91
Control Delay	22.2	21.2	21.9	41.2
Queue Delay	0.3	0.0	0.0	1.0
Total Delay	22.5	21.2	21.9	42.3
LOS	C	C	C	D
Approach Delay	22.5		21.8	42.3
Approach LOS	C		C	D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 104 (87%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 29.0
 Intersection Capacity Utilization 75.7%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 22: ELMWOOD AVENUE & Kendrick



HCM Unsignalized Intersection Capacity Analysis
 25: Lattimore & Kendrick

Uof R IPD
 7/10/2013

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	59	122	611	52	97	328
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	66	136	679	58	108	364
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						795
pX, platoon unblocked	0.95					
vC, conflicting volume	1288	708				737
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1276	708				737
tC, single (s)	6.4	6.2				4.1
tC, 2 stage (s)						
tF (s)	3.5	3.3				2.2
p0 queue free %	57	69				88
cM capacity (veh/h)	153	435				869
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	66	136	737	108	364	
Volume Left	66	0	0	108	0	
Volume Right	0	136	58	0	0	
cSH	153	435	1700	869	1700	
Volume to Capacity	0.43	0.31	0.43	0.12	0.21	
Queue Length 95th (ft)	48	33	0	11	0	
Control Delay (s)	45.2	17.0	0.0	9.7	0.0	
Lane LOS	E	C		A		
Approach Delay (s)	26.2		0.0	2.2		
Approach LOS	D					
Intersection Summary						
Average Delay			4.5			
Intersection Capacity Utilization			54.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 26: Lot #1 & Kendrick

Uof R IPD
 7/10/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	25	497	35	655	385	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	552	39	728	428	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					957	
pX, platoon unblocked	0.97	0.97	0.97			
vC, conflicting volume	1234	429	430			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1225	391	393			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	13	97			
cM capacity (veh/h)	184	635	1127			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	580	39	728	430
Volume Left	28	39	0	0
Volume Right	552	0	0	2
cSH	568	1127	1700	1700
Volume to Capacity	1.02	0.03	0.43	0.25
Queue Length 95th (ft)	387	3	0	0
Control Delay (s)	70.1	8.3	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	70.1	0.4		0.0
Approach LOS	F			

Intersection Summary			
Average Delay		23.1	
Intersection Capacity Utilization		73.3%	ICU Level of Service D
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 27: Westmoreland & Kendrick

Uof R IPD
 7/10/2013



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↔			↕	↗		↔		↖	↕	
Volume (veh/h)	90	1	23	19	1	76	4	226	15	156	689	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	100	1	26	21	1	84	4	251	17	173	766	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						8						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1424	1389	766	1407	1382	259	767			268		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1424	1389	766	1407	1382	259	767			268		
iC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
iC, 2 stage (s)												
iF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	99	94	78	99	89	99			87		
cM capacity (veh/h)	90	123	403	97	124	779	847			1296		

Direction, Lane #	SE 1	NW 1	NE 1	SW 1	SW 2
Volume Total	127	107	272	173	767
Volume Left	100	21	4	173	0
Volume Right	26	84	17	0	1
cSH	107	472	847	1296	1700
Volume to Capacity	1.19	0.23	0.01	0.13	0.45
Queue Length 95th (ft)	206	22	0	12	0
Control Delay (s)	221.2	18.9	0.2	8.2	0.0
Lane LOS	F	C	A	A	
Approach Delay (s)	221.2	18.9	0.2	1.5	
Approach LOS	F	C			

Intersection Summary

Average Delay	21.8
Intersection Capacity Utilization	72.5%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 91: Elmwood Ave & East Dr

Uof R IPD
 7/10/2013

	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑		↘	↑↑	↖	↗	
Volume (veh/h)	1134	97	81	805	70	215	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	1260	108	90	894	78	239	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage (veh)							
Upstream signal (ft)	329			1089			
pX, platoon unblocked			0.78		0.83	0.78	
vC, conflicting volume			1368		1941	684	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			907		1142	30	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)							
tF (s)			2.2		3.5	3.3	
p0 queue free %			85		43	70	
cM capacity (veh/h)			582		137	809	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	840	528	90	447	447	78	239
Volume Left	0	0	90	0	0	78	0
Volume Right	0	108	0	0	0	0	239
cSH	1700	1700	582	1700	1700	137	809
Volume to Capacity	0.49	0.31	0.15	0.26	0.26	0.57	0.30
Queue Length 95th (ft)	0	0	14	0	0	71	31
Control Delay (s)	0.0	0.0	12.3	0.0	0.0	61.4	11.3
Lane LOS			B			F	B
Approach Delay (s)	0.0		1.1			23.6	
Approach LOS						C	
Intersection Summary							
Average Delay			3.2				
Intersection Capacity Utilization			54.4%	ICU Level of Service	A		
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis
109: Kendrick &

Uof R IPD
7/10/2013



Movement	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations			↶	↷	↷	↷
Volume (veh/h)	0	0	1	263	555	176
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	1	292	617	196
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	911	617	812			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	911	617	812			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	304	490	814			

Direction, Lane #	NE 1	NE 2	SW 1	SW 2
Volume Total	1	292	617	196
Volume Left	1	0	0	0
Volume Right	0	0	0	196
cSH	814	1700	1700	1700
Volume to Capacity	0.00	0.17	0.36	0.12
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	9.4	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		32.5%	ICU Level of Service A
Analysis Period (min)		15	

Timings
162: ELMWOOD AVENUE & South

Uof R IPD
7/10/2013

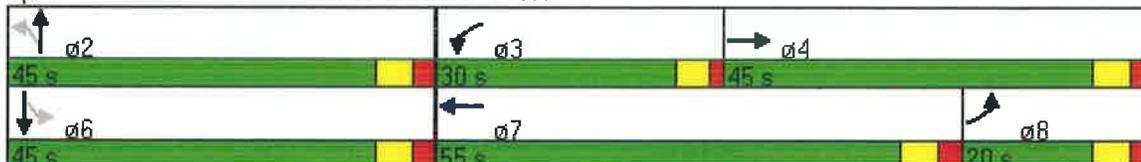


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↕	↖	↕		↕		↕
Volume (vph)	175	1118	223	550	6	543	52	442
Turn Type	custom		Prot		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	8				2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	20.0	45.0	30.0	55.0	45.0	45.0	45.0	45.0
Total Split (%)	16.7%	37.5%	25.0%	45.8%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?								
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	33.8	45.4	23.6	35.2		42.0		42.0
Actuated g/C Ratio	0.28	0.38	0.20	0.29		0.35		0.35
v/c Ratio	0.39	0.96	0.71	0.63		0.73		0.81
Control Delay	23.4	25.7	56.4	38.8		29.5		43.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	23.4	25.7	56.4	38.8		29.5		43.6
LOS	C	C	E	D		C		D
Approach Delay		25.4		43.7		29.5		43.6
Approach LOS		C		D		C		D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 86 (72%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 33.6
 Intersection LOS: C
 Intersection Capacity Utilization 96.7%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 162: ELMWOOD AVENUE & South



Timings
222: I-390 NB & E Henrietta

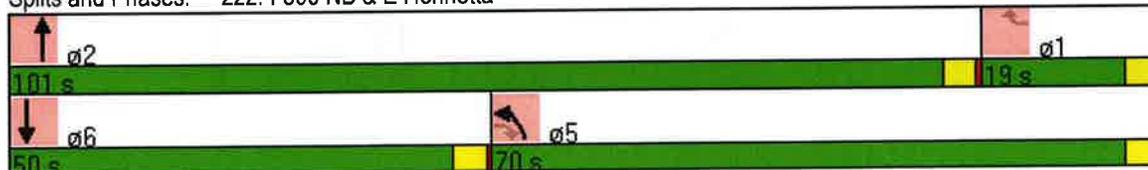


Lane Group	EBR	WBR	NBL	NBT	SBT	SBR
Lane Configurations	↑	↑↑	↑↑	↑↑	↑↑↑	↑
Volume (vph)	260	334	535	1031	1412	455
Turn Type	custom	custom	Prot			Free
Protected Phases			5	2	6	
Permitted Phases	5	1				Free
Detector Phase	5	1	5	2	6	
Switch Phase						
Minimum Initial (s)	3.0	3.0	3.0	4.0	4.0	
Minimum Split (s)	8.0	8.0	8.0	20.0	20.0	
Total Split (s)	70.0	19.0	70.0	101.0	50.0	0.0
Total Split (%)	58.3%	15.8%	58.3%	84.2%	41.7%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	
Recall Mode	Min	None	Min	C-Max	C-Max	
Act Effct Green (s)	61.2	10.2	61.2	103.8	52.8	120.0
Actuated g/C Ratio	0.51	0.08	0.51	0.86	0.44	1.00
v/c Ratio	0.35	0.72	0.34	0.37	0.70	0.32
Control Delay	18.2	19.1	23.5	1.4	20.1	0.4
Queue Delay	0.0	0.0	0.9	0.6	0.0	0.0
Total Delay	18.2	19.1	24.5	2.0	20.1	0.4
LOS	B	B	C	A	C	A
Approach Delay				9.7	15.3	
Approach LOS				A	B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 116 (97%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 13.6
 Intersection LOS: B
 Intersection Capacity Utilization 50.0%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 222: I-390 NB & E Henrietta



Timings
393: ELMWOOD AVENUE & U of R

Uof R IPD
7/10/2013



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↖	↑↑	↖	↗
Volume (vph)	957	34	868	26	39
Turn Type		pm+pt			Perm
Protected Phases	1	3	13	2	
Permitted Phases		13			2
Detector Phase	1	3	13	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	65.0	20.0	85.0	35.0	35.0
Total Split (%)	54.2%	16.7%	70.8%	29.2%	29.2%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effct Green (s)	62.1	79.0	82.0	32.0	32.0
Actuated g/C Ratio	0.52	0.66	0.68	0.27	0.27
v/c Ratio	0.60	0.10	0.40	0.06	0.09
Control Delay	22.7	4.8	5.7	33.4	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	4.8	5.7	33.4	10.3
LOS	C	A	A	C	B
Approach Delay	22.7		5.7	19.6	
Approach LOS	C		A	B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 25 (21%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 14.8
 Intersection Capacity Utilization 39.9%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 393: ELMWOOD AVENUE & U of R



Timings
395: Crittenden Blvd & East Dr

Uof R IPD
7/10/2013



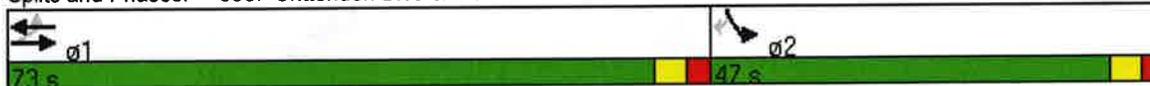
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	57	576	319	134	98
Turn Type	Perm				Perm
Protected Phases		1	1	2	
Permitted Phases	1				2
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	29.5	29.5
Total Split (s)	73.0	73.0	73.0	47.0	47.0
Total Split (%)	60.8%	60.8%	60.8%	39.2%	39.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	95.1	95.1	95.1	18.9	18.9
Actuated g/C Ratio	0.79	0.79	0.79	0.16	0.16
v/c Ratio	0.08	0.23	0.15	0.53	0.32
Control Delay	3.2	3.2	4.1	52.8	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.2	3.2	4.1	52.8	10.0
LOS	A	A	A	D	B
Approach Delay		3.2	4.1	34.7	
Approach LOS		A	A	C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 9.4
 Intersection Capacity Utilization 33.5%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr



Timings
470: MCH & E Henrietta

Uof R IPD
7/10/2013



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	53	1	216	1	9	1230	160	1559
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	14.0	39.0	14.0	39.0
Total Split (s)	35.0	35.0	35.0	35.0	15.0	70.0	15.0	70.0
Total Split (%)	29.2%	29.2%	29.2%	29.2%	12.5%	58.3%	12.5%	58.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	4.0	3.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	28.4	28.4	28.4	28.4	80.6	70.1	80.6	69.1
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.67	0.58	0.67	0.58
v/c Ratio	0.23	0.18	0.80	0.28	0.04	0.76	0.72	0.88
Control Delay	38.0	8.6	62.9	7.4	5.1	25.0	34.3	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	2.3
Total Delay	38.0	8.6	62.9	7.5	5.1	25.2	34.3	17.8
LOS	D	A	E	A	A	C	C	B
Approach Delay		21.3		43.2		25.1		19.3
Approach LOS		C		D		C		B

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 63 (53%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 23.8
 Intersection Capacity Utilization 76.8%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 470: MCH & E Henrietta



Timings
500: Crittenden & E Henrietta

Uof R IPD
7/10/2013

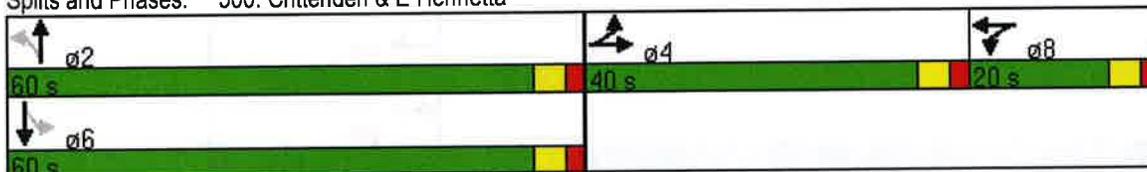


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↔	↕	↖	↕	↖	↕
Volume (vph)	881	1	1	82	1228	10	1326
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	40.0	40.0	20.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	16.7%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	37.0	37.0	8.7	69.7	69.7	69.7	69.7
Actuated g/C Ratio	0.31	0.31	0.07	0.58	0.58	0.58	0.58
v/c Ratio	1.17	1.07	0.13	1.42	0.66	0.10	0.98
Control Delay	134.1	98.9	29.9	284.7	20.1	15.7	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	134.1	98.9	29.9	284.7	20.2	15.7	32.6
LOS	F	F	C	F	C	B	C
Approach Delay		117.3	29.9		36.7		32.5
Approach LOS		F	C		D		C

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 105 (88%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.42
 Intersection Signal Delay: 55.1
 Intersection Capacity Utilization 101.0%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service G

Splits and Phases: 500: Crittenden & E Henrietta



Timings
501: Southland Drive & West Henrietta Road

Uof R IPD
7/10/2013

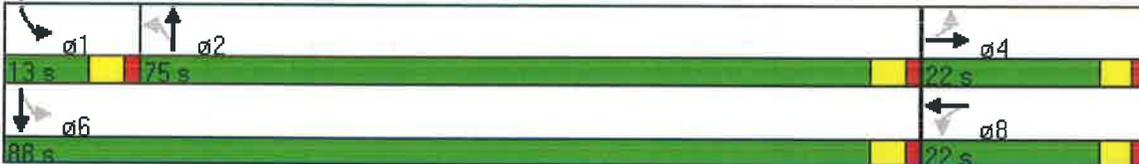


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕	↙	↕	↙	↕
Volume (vph)	9	1	25	1	6	1601	24	1283
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	75.0	75.0	13.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	68.2%	68.2%	11.8%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.7		10.7	86.7	86.7	93.3	93.3
Actuated g/C Ratio		0.10		0.10	0.79	0.79	0.85	0.85
v/c Ratio		0.23		0.59	0.03	0.64	0.11	0.48
Control Delay		27.6		21.3	4.7	8.5	2.7	3.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.2
Total Delay		27.6		21.3	4.7	8.5	2.7	3.2
LOS		C		C	A	A	A	A
Approach Delay		27.6		21.3		8.5		3.2
Approach LOS		C		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 62 (56%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 7.0
 Intersection Capacity Utilization 61.2%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 501: Southland Drive & West Henrietta Road



Timings
502: Doncaster Road & West Henrietta Road

Uof R IPD
7/10/2013



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕↕		↕↕
Volume (vph)	3	1	14	1	6	1605	12	1299
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		7.0		7.0		101.6		101.6
Actuated g/C Ratio		0.06		0.06		0.92		0.92
v/c Ratio		0.07		0.30		0.58		0.49
Control Delay		39.5		38.9		4.5		1.0
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		39.5		38.9		4.6		1.0
LOS		D		D		A		A
Approach Delay		39.5		38.9		4.6		1.0
Approach LOS		D		D		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 71 (65%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 3.3
 Intersection Capacity Utilization 58.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 502: Doncaster Road & West Henrietta Road



Timings
503: Crittenden & West Henrietta Road

Uof R IPD
7/10/2013

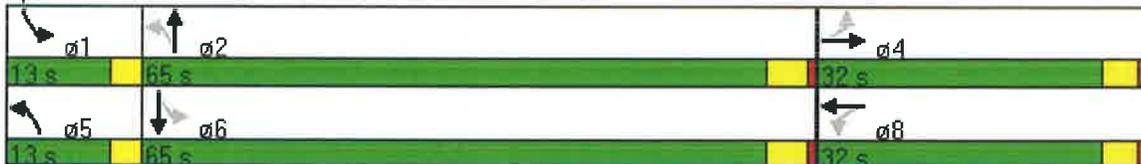


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔	↙	↕	↙	↕
Volume (vph)	23	64	258	169	68	1364	198	1292
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	9.0	25.0	8.0	25.0
Total Split (s)	32.0	32.0	32.0	32.0	13.0	65.0	13.0	65.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	11.8%	59.1%	11.8%	59.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	0.0	1.0	0.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	0.0	-2.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		29.0		29.0	69.3	62.0	74.4	66.5
Actuated g/C Ratio		0.26		0.26	0.63	0.56	0.68	0.60
v/c Ratio		0.21		0.97	0.37	0.90	0.96	0.73
Control Delay		22.6		62.4	11.9	39.8	74.7	20.2
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		22.6		62.4	11.9	39.8	74.7	20.2
LOS		C		E	B	D	E	C
Approach Delay		22.6		62.4		38.7		27.0
Approach LOS		C		E		D		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 37.3
 Intersection Capacity Utilization 88.4%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 503: Crittenden & West Henrietta Road



Timings
504: BHTL & West Henrietta Road

Uof R IPD
7/10/2013

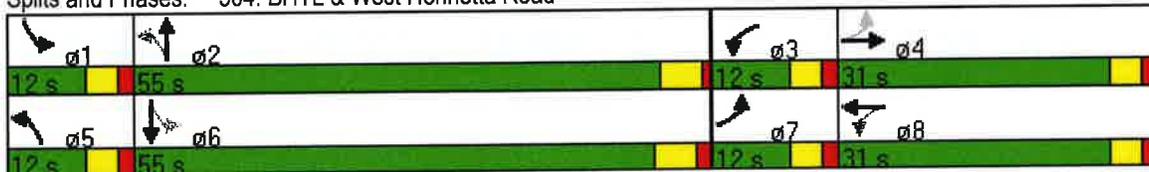


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	170	272	326	315	39	1326	140	1369
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	12.0	31.0	12.0	31.0	12.0	55.0	12.0	55.0
Total Split (%)	10.9%	28.2%	10.9%	28.2%	10.9%	50.0%	10.9%	50.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	31.6	22.6	31.6	22.6	64.0	55.9	68.7	62.5
Actuated g/C Ratio	0.29	0.21	0.29	0.21	0.58	0.51	0.62	0.57
v/c Ratio	0.88	0.51	1.30	0.72	0.22	0.95	0.66	0.86
Control Delay	68.3	38.1	187.7	38.4	11.7	39.5	28.1	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	38.1	187.7	38.4	11.7	39.5	28.1	27.4
LOS	E	D	F	D	B	D	C	C
Approach Delay		48.3		97.6		38.8		27.5
Approach LOS		D		F		D		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 49 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.30
 Intersection Signal Delay: 46.3
 Intersection Capacity Utilization 91.4%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 504: BHTL & West Henrietta Road



HCM Unsignalized Intersection Capacity Analysis
 505: Crittenden & East River Road

Uof R IPD
 7/10/2013



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↕
Volume (veh/h)	102	11	189	34	12	284
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	113	12	210	38	13	316
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	571	229			248	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	571	229			248	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	98			99	
cM capacity (veh/h)	477	810			1318	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	126	248	329
Volume Left	113	0	13
Volume Right	12	38	0
cSH	497	1700	1318
Volume to Capacity	0.25	0.15	0.01
Queue Length 95th (ft)	25	0	1
Control Delay (s)	14.7	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	14.7	0.0	0.4
Approach LOS	B		

Intersection Summary			
Average Delay		2.8	
Intersection Capacity Utilization		37.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
506: East River Road & Site Drive

Uof R IPD
7/10/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Volume (veh/h)	729	5	10	435	4	55
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	810	6	11	483	4	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	615			1304		
pX, platoon unblocked						
vC, conflicting volume				816	1077	408
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				816	1077	408
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				99	98	90
cM capacity (veh/h)				808	211	593

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	540	276	172	322	4	61
Volume Left	0	0	11	0	4	0
Volume Right	0	6	0	0	0	61
cSH	1700	1700	808	1700	211	593
Volume to Capacity	0.32	0.16	0.01	0.19	0.02	0.10
Queue Length 95th (ft)	0	0	1	0	2	9
Control Delay (s)	0.0	0.0	0.7	0.0	22.4	11.8
Lane LOS	A			C		B
Approach Delay (s)	0.0		0.3		12.5	
Approach LOS					B	

Intersection Summary

Average Delay	0.7					
Intersection Capacity Utilization	30.4%		ICU Level of Service		A	
Analysis Period (min)	15					

Intersection							
Intersection Delay (sec/veh)	6.1						
Intersection LOS	A						
Approach	EB		WB		NB		SB
Entry Lanes	2		2		1		2
Conflicting Circle Lanes	2		2		2		2
Adjusted Approach Flow (vph)	261		343		104		617
Demand Flow Rate (pc/h)	266		350		105		629
Vehicles Circulating (pc/h)	490		126		626		174
Vehicles Exiting (pc/h)	313		605		130		110
Follow-Up Headway (s)	3.186		3.186		3.186		3.186
Ped Vol. Crossing Leg (#/hr)	0		0		0		0
Ped Capacity Adjustment	1.000		1.000		1.000		1.000
Approach Delay (sec/veh)	6.4		2.3		6.6		8.1
Approach LOS	A		A		A		A
Lane	Left	Right	Left	Bypass	Left	Left	Right
Designated moves	LT	TR	LT	R	LTR	LT	R
Assumed Moves	LT	TR	LT	R	LTR	LT	R
Right Turn Channelized	Free						
Lane Utilization	0.470	0.530	1.000		1.000	0.728	0.272
Critical Headway (s)	4.293	4.113	4.293		4.113	4.293	4.113
Entry Flow Rate (pc/h)	125	141	158	192	105	458	171
Capacity, Entry Lane (pc/h)	782	802	1028	1938	729	992	1000
Entry HV Adjustment Factor	0.981	0.981	0.978	0.980	0.987	0.981	0.982
Flow Rate, Entry (vph)	123	138	155	188	104	449	168
Capacity, Entry (vph)	767	786	1005	1900	719	973	983
Volume to Capacity Ratio	0.160	0.176	0.154	0.099	0.144	0.462	0.171
Control Delay (sec/veh)	6.4	6.4	5.0	0.0	6.6	9.1	5.3
Level of Service	A	A	A	A	A	A	A
95th-Percentile Queue (veh)	1	1	1	0	1	2	1

AM Peak Hour

Build Conditions 5-Year

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HCM Unsignalized Intersection Capacity Analysis University of Rochester < October 2011 Revision
 1: East River Road & Kendrick 7/11/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized						Yes						
Volume (veh/h)	182	114	33	34	228	995	9	37	41	208	12	75
Peak Hour Factor	0.90	0.90	0.92	0.92	0.90	0.90	0.92	0.92	0.92	0.90	0.92	0.90
Hourly flow rate (vph)	202	127	36	37	253	1106	10	40	45	231	13	83
Approach Volume (veh/h)		365			290			95			327	
Crossing Volume (veh/h)		281			252			560			300	
High Capacity (veh/h)		1111			1136			890			1094	
High v/c (veh/h)		0.33			0.26			0.11			0.30	
Low Capacity (veh/h)		913			936			716			898	
Low v/c (veh/h)		0.40			0.31			0.13			0.36	
Intersection Summary												
Maximum v/c High			0.33									
Maximum v/c Low			0.40									
Intersection Capacity Utilization			77.8%			ICU Level of Service					D	

Timings
2: East River Road & I-390 S On Ramp



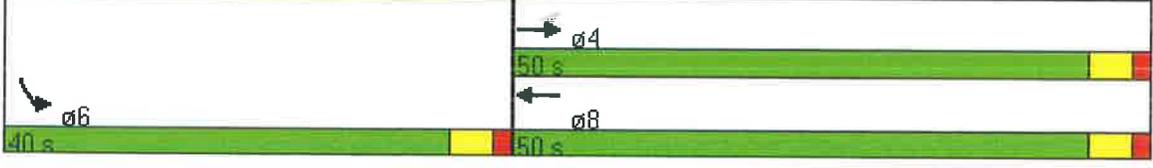
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↑↑	↑↔	↔↔	↔
Volume (vph)	130	233	750	1113	445
Turn Type	Perm				Free
Protected Phases		4	8	6	
Permitted Phases	4				Free
Detector Phase	4	4	8	6	
Switch Phase					
Minimum Initial (s)	3.0	3.0	3.0	3.0	
Minimum Split (s)	25.0	25.0	25.0	25.0	
Total Split (s)	50.0	50.0	50.0	40.0	0.0
Total Split (%)	55.6%	55.6%	55.6%	44.4%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	3.0	3.0	3.0	2.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	
Act Effct Green (s)	33.4	35.5	35.5	33.1	75.0
Actuated g/C Ratio	0.45	0.47	0.47	0.44	1.00
v/c Ratio	0.91	0.15	0.58	0.82	0.31
Control Delay	76.7	11.5	15.3	25.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	76.7	11.5	15.3	25.7	0.5
LOS	E	B	B	C	A
Approach Delay		34.5	15.3	18.5	
Approach LOS		C	B	B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 75
 Natural Cycle: 50
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 19.6
 Intersection Capacity Utilization 73.5%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 2: East River Road & I-390 S On Ramp



Timings
3: College Town & Mt. Hope



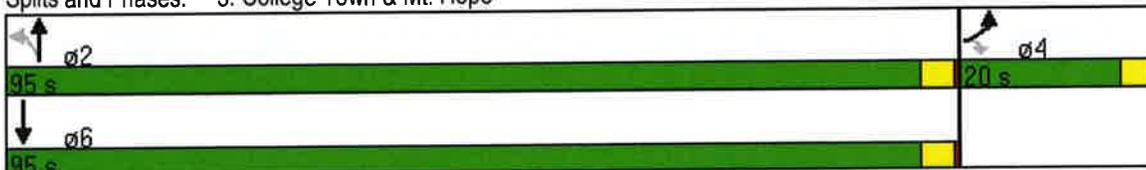
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	15	41	18	1008	1254
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	95.0	95.0	95.0
Total Split (%)	17.4%	17.4%	82.6%	82.6%	82.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	6.8	6.8	102.9	102.9	102.9
Actuated g/C Ratio	0.06	0.06	0.89	0.89	0.89
v/c Ratio	0.15	0.33	0.06	0.35	0.43
Control Delay	53.9	21.6	0.8	0.8	0.7
Queue Delay	0.0	0.0	0.0	0.1	0.2
Total Delay	53.9	21.6	0.8	0.9	1.0
LOS	D	C	A	A	A
Approach Delay	30.0			0.9	1.0
Approach LOS	C			A	A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.43
 Intersection Signal Delay: 1.6
 Intersection Capacity Utilization 44.9%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: College Town & Mt. Hope





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↑↑↑	↑↑	↗
Volume (veh/h)	0	0	0	1631	796	174
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	1773	865	189
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				267	774	
pX, platoon unblocked	0.92	0.88	0.88			
vC, conflicting volume	1456	433	1054			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	470	69	779			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	479	858	730			
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	591	591	591	433	433	189
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	189
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.35	0.35	0.35	0.25	0.25	0.11
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	34.8%			ICU Level of Service	A	
Analysis Period (min)	15					

Timings
6: East River Road & West Henrietta Road

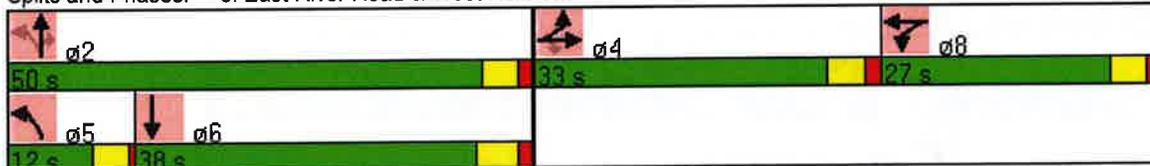


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Configurations	↖	↔	↗	↖	↕	↖	↕	↗	↕
Volume (vph)	464	62	716	101	696	144	946	65	687
Turn Type	Split		Perm	Split		pm+pt		Perm	
Protected Phases	4	4		8	8	5	2		6
Permitted Phases			4			2		2	
Detector Phase	4	4	4	8	8	5	2	2	6
Switch Phase									
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0	3.0
Minimum Split (s)	15.0	15.0	15.0	15.0	15.0	8.0	29.0	29.0	25.5
Total Split (s)	33.0	33.0	33.0	27.0	27.0	12.0	50.0	50.0	38.0
Total Split (%)	30.0%	30.0%	30.0%	24.5%	24.5%	10.9%	45.5%	45.5%	34.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	0.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	2.0	3.0	4.0	3.0
Lead/Lag						Lead			Lag
Lead-Lag Optimize?						Yes			
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	28.7	28.7	28.7	25.3	25.3	48.0	47.0	46.0	35.0
Actuated g/C Ratio	0.26	0.26	0.26	0.23	0.23	0.44	0.43	0.42	0.32
v/c Ratio	0.81	0.63	0.62	0.28	1.26	0.70	0.48	0.10	0.79
Control Delay	54.0	17.9	9.8	37.8	161.1	33.1	22.6	7.3	39.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	17.9	9.8	37.8	161.1	33.1	22.6	7.3	39.8
LOS	D	B	A	D	F	C	C	A	D
Approach Delay		24.5			148.9		23.0		39.8
Approach LOS		C			F		C		D

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.26
 Intersection Signal Delay: 57.1
 Intersection Capacity Utilization 88.4%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service E

Splits and Phases: 6: East River Road & West Henrietta Road

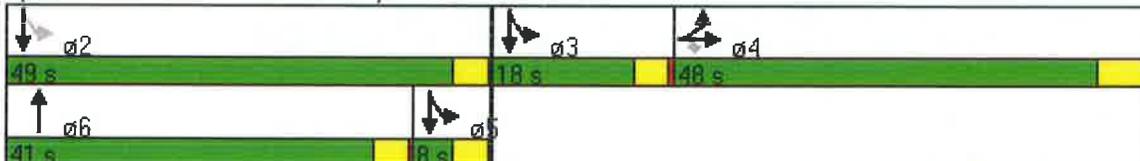


								ø2	ø3	ø5
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	ø2	ø3	ø5
Lane Configurations										
Volume (vph)	493	83	892	902	220	283	1471			
Turn Type	Split		Perm		Free	pm+pt				
Protected Phases	4	4		6		3 5	2 3 5	2	3	5
Permitted Phases			4		Free	2 3 5				
Detector Phase	4	4	4	6		3 5	2 3 5			
Switch Phase										
Minimum Initial (s)	3.0	3.0	3.0	4.0				4.0	4.0	3.0
Minimum Split (s)	25.5	25.5	25.5	20.0				20.0	20.0	8.0
Total Split (s)	48.0	48.0	48.0	41.0	0.0	26.0	75.0	49.0	18.0	8.0
Total Split (%)	41.7%	41.7%	41.7%	35.7%	0.0%	22.6%	65.2%	43%	16%	7%
Yellow Time (s)	5.0	5.0	5.0	3.5				3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5				0.5	0.5	0.5
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-1.0	-1.0	-1.0	-1.0			
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lead/Lag	Lag	Lag	Lag	Lead					Lead	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	C-Max				C-Max	None	Min
Act Effct Green (s)	43.5	43.5	43.5	39.6	115.0	65.5	65.5			
Actuated g/C Ratio	0.38	0.38	0.38	0.34	1.00	0.57	0.57			
v/c Ratio	0.66	0.89dr	0.89	0.82	0.15	0.39	0.81			
Control Delay	35.3	32.3	51.3	35.8	0.2	24.6	17.8			
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0	2.2			
Total Delay	35.3	32.3	51.4	35.8	0.2	24.6	20.0			
LOS	D	C	D	D	A	C	B			
Approach Delay		38.8		28.8			20.7			
Approach LOS		D		C			C			

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 28.9
 Intersection LOS: C
 Intersection Capacity Utilization 84.2%
 ICU Level of Service E
 Analysis Period (min) 15
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: I-390 SB Ramp & E Henrietta



Timings
10: Westfall & E Henrietta



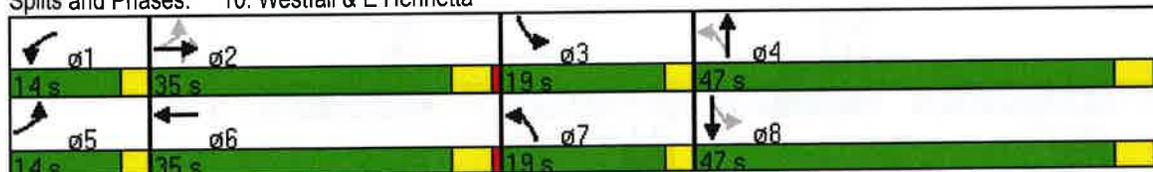
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	89	325	222	305	236	1100	465	201	943
Turn Type	pm+pt		Prot		pm+pt		custom	pm+pt	
Protected Phases	5	2	1	6	7	4		3	8
Permitted Phases	2				4		2	8	
Detector Phase	5	2	1	6	7	4	2	3	8
Switch Phase									
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	10.0	7.0	5.0	7.0
Minimum Split (s)	10.0	32.0	10.0	32.0	10.0	32.0	32.0	10.0	32.0
Total Split (s)	14.0	35.0	14.0	35.0	19.0	47.0	35.0	19.0	47.0
Total Split (%)	12.2%	30.4%	12.2%	30.4%	16.5%	40.9%	30.4%	16.5%	40.9%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0	-2.0	-1.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	C-Max	None	Max
Act Effct Green (s)	43.0	32.4	10.6	32.4	60.0	45.3	31.4	60.0	45.3
Actuated g/C Ratio	0.37	0.28	0.09	0.28	0.52	0.39	0.27	0.52	0.39
v/c Ratio	0.34	0.46	0.78	0.55	0.89	0.88	0.73	0.76	0.85
Control Delay	21.4	31.0	68.5	28.4	57.3	45.5	13.3	33.3	39.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	10.2	1.2	0.0	0.1
Total Delay	21.4	31.0	68.5	28.4	57.3	55.7	14.5	33.3	39.7
LOS	C	C	E	C	E	E	B	C	D
Approach Delay		29.3		40.5		45.2			38.7
Approach LOS		C		D		D			D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 44 (38%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 40.7
 Intersection Capacity Utilization 75.9%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 10: Westfall & E Henrietta



Timings
11: South & E Henrietta

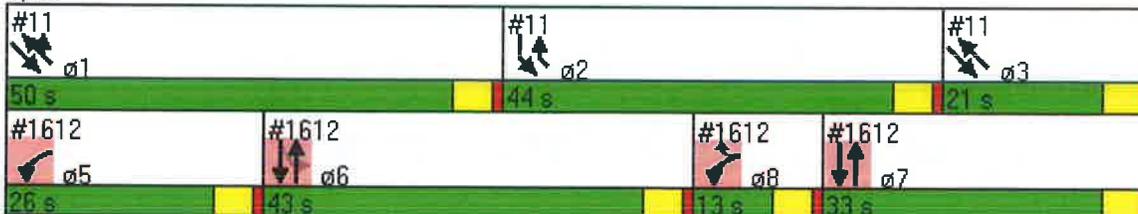
Lane Group	SBL	SET	NWT	NWR	ø1	ø3	ø5	ø6	ø7	ø8
Lane Configurations										
Volume (vph)	605	486	551	714						
Turn Type				custom						
Protected Phases	2	13	13	12	1	3	5	6	7	8
Permitted Phases		13		1						
Detector Phase	2	13	13	12						
Switch Phase										
Minimum Initial (s)	10.0				24.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	21.0	33.0	33.0	13.0
Total Split (s)	44.0	71.0	71.0	94.0	50.0	21.0	26.0	43.0	33.0	13.0
Total Split (%)	38.3%	61.7%	61.7%	81.7%	43%	18%	23%	37%	29%	11%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0						
Total Lost Time (s)	3.0	3.0	3.0	3.0						
Lead/Lag	Lag				Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None				C-Max	None	C-Max	None	None	None
Act Effct Green (s)	34.0	75.0	75.0	87.7						
Actuated g/C Ratio	0.30	0.65	0.65	0.76						
v/c Ratio	0.66	0.25	0.50	0.57						
Control Delay	50.2	6.0	5.5	4.2						
Queue Delay	1.5	0.0	0.0	0.5						
Total Delay	51.7	6.0	5.5	4.7						
LOS	D	A	A	A						
Approach Delay	51.7	6.0	5.0							
Approach LOS	D	A	A							

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NWSE and 5:, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 17.2
 Intersection Capacity Utilization 52.9%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 11: South & E Henrietta



Timings
12: Crittenden Blvd & Mt. Hope

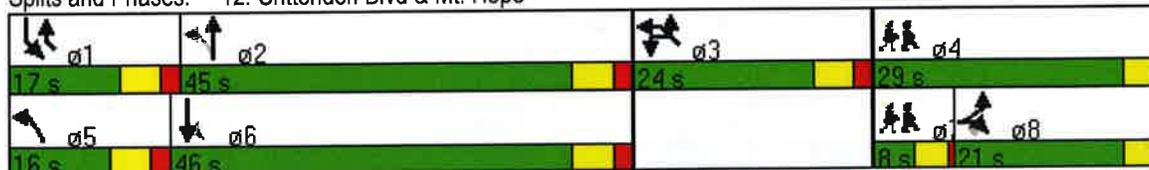


Lane Group	EBL	EBR	EBR2	NBL	NBT	SBL	SBT	NWL	NWR	ø4	ø7
Lane Configurations											
Volume (vph)	98	179	136	190	520	346	812	194	380		
Turn Type		Prot	Perm	pm+pt		pm+pt			pt+ov		
Protected Phases	8	8		5	2	1	6	3	31	4	7
Permitted Phases			8	2		6					
Detector Phase	8	8	8	5	2	1	6	3	31		
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	5.0	7.0	5.0	7.0	6.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	12.0	27.0	12.0	27.0	18.0		8.0	8.0
Total Split (s)	21.0	21.0	21.0	16.0	45.0	17.0	46.0	24.0	41.0	29.0	8.0
Total Split (%)	18.3%	18.3%	18.3%	13.9%	39.1%	14.8%	40.0%	20.9%	35.7%	25%	7%
Yellow Time (s)	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	2.0	2.0	2.0	2.0	2.0		0.5	0.5
Lost Time Adjust (s)	-3.0	-3.0	-1.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	1.0	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes								Yes
Recall Mode	None	None	None	None	C-Max	None	C-Max	None		None	None
Act Effct Green (s)	22.5	22.5	20.5	59.7	44.9	64.7	48.1	19.6	37.6		
Actuated g/C Ratio	0.20	0.20	0.18	0.52	0.39	0.56	0.42	0.17	0.33		
v/c Ratio	0.31	0.64	0.54	0.70	0.43	0.76	0.78	0.72	0.59		
Control Delay	43.2	53.5	50.3	34.9	41.0	34.2	40.3	53.1	10.4		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0		
Total Delay	43.2	53.5	50.3	34.9	41.0	34.2	40.4	53.1	10.4		
LOS	D	D	D	C	D	C	D	D	B		
Approach Delay	50.0				39.4		38.9	24.9			
Approach LOS	D				D		D	C			

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 37.9
 Intersection Capacity Utilization 68.9%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service C

Splits and Phases: 12: Crittenden Blvd & Mt. Hope



Timings
13: Elmwood Ave & Mt. Hope

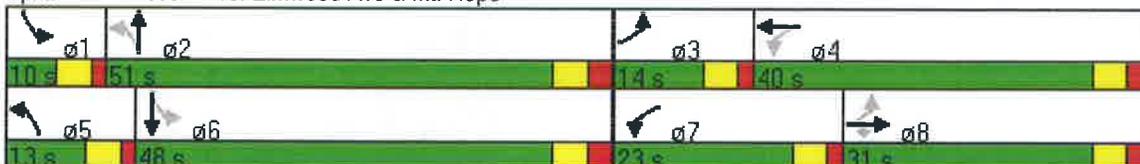
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	202	590	176	332	909	181	708	38	751
Turn Type	pm+pt		Perm	pm+pt		pm+pt		pm+pt	
Protected Phases	3	8		7	4	5	2	1	6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	7	4	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	4.0	7.0	4.0	7.0
Minimum Split (s)	12.0	31.0	31.0	12.0	31.0	10.0	33.0	10.0	33.0
Total Split (s)	14.0	31.0	31.0	23.0	40.0	13.0	51.0	10.0	48.0
Total Split (%)	12.2%	27.0%	27.0%	20.0%	34.8%	11.3%	44.3%	8.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-1.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	39.0	28.0	26.0	51.0	37.0	58.0	50.0	51.9	45.0
Actuated g/C Ratio	0.34	0.24	0.23	0.44	0.32	0.50	0.43	0.45	0.39
v/c Ratio	0.95	0.76	0.41	0.98	0.90	0.91	0.62	0.18	0.92
Control Delay	75.2	31.5	10.4	73.5	23.1	77.1	19.7	16.4	42.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	75.2	31.5	10.4	73.5	23.1	77.1	19.9	16.4	42.3
LOS	E	C	B	E	C	E	B	B	D
Approach Delay		36.7			36.4		30.0		41.5
Approach LOS		D			D		C		D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 113 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 36.3
 Intersection Capacity Utilization 93.0%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 13: Elmwood Ave & Mt. Hope



Timings
14: Lattimore & Mt. Hope



Lane Group	EBL	NBL	NBT	SBT
Lane Configurations	Y		↑↑	↑↑
Volume (vph)	9	124	731	856
Turn Type	Perm			
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	26.0	24.0	24.0	24.0
Total Split (s)	27.0	88.0	88.0	88.0
Total Split (%)	23.5%	76.5%	76.5%	76.5%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	C-Max	C-Max	C-Max
Act Effct Green (s)	9.0		100.0	100.0
Actuated g/C Ratio	0.08		0.87	0.87
v/c Ratio	0.25		0.48	0.34
Control Delay	26.3		5.9	0.5
Queue Delay	0.0		0.0	0.0
Total Delay	26.3		5.9	0.5
LOS	C		A	A
Approach Delay	26.3		5.9	0.5
Approach LOS	C		A	A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.48
 Intersection Signal Delay: 3.5
 Intersection Capacity Utilization 64.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 14: Lattimore & Mt. Hope



Timings
15: Westfall & Mt. Hope



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↗	↖	↗	↖	↕	↗	↖	↕
Volume (vph)	9	132	66	191	239	106	768	432	109	714
Turn Type	Perm		custom	pm+pt		pm+pt		Perm	pm+pt	
Protected Phases		4	4	3	3 4	2	1		2	1
Permitted Phases	4		4	3 4		1		1	1	
Detector Phase	4	4	4	3	3 4	2	1	1	2	1
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	5.0		5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	29.0	29.0	29.0	11.0		13.0	40.0	40.0	13.0	40.0
Total Split (s)	29.0	29.0	29.0	14.0	43.0	32.0	40.0	40.0	32.0	40.0
Total Split (%)	25.2%	25.2%	25.2%	12.2%	37.4%	27.8%	34.8%	34.8%	27.8%	34.8%
Yellow Time (s)	4.0	4.0	4.0	3.0		3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	1.0	2.0		2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	None	None	None		None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		18.5	18.5	40.4	43.4	62.6	52.6	51.6	62.6	52.6
Actuated g/C Ratio		0.16	0.16	0.35	0.38	0.54	0.46	0.45	0.54	0.46
v/c Ratio		0.54	0.24	0.45	0.54	0.33	0.53	0.49	0.35	0.49
Control Delay		50.4	16.1	28.9	30.1	21.5	26.1	4.5	36.5	28.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		50.4	16.1	28.9	30.1	21.5	26.1	4.5	36.5	28.2
LOS		D	B	C	C	C	C	A	D	C
Approach Delay		39.5			29.6		18.6			29.3
Approach LOS		D			C		B			C

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 25.2
 Intersection Capacity Utilization 66.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 15: Westfall & Mt. Hope



Timings
18: Iona & E Henrietta

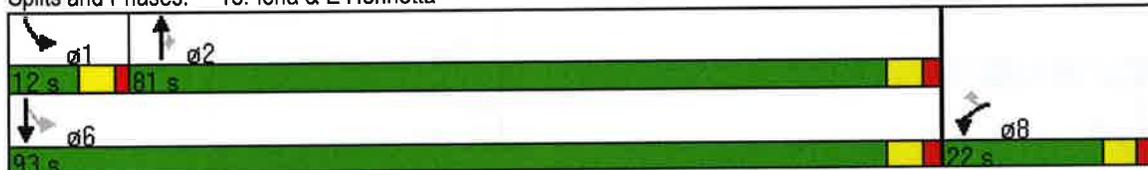


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	114	30	1839	217	106	1088
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	21.5	21.5	9.0	21.5
Total Split (s)	22.0	22.0	81.0	81.0	12.0	93.0
Total Split (%)	19.1%	19.1%	70.4%	70.4%	10.4%	80.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.0	2.0	1.5	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	12.8	12.8	78.3	78.3	91.2	90.7
Actuated g/C Ratio	0.11	0.11	0.68	0.68	0.79	0.79
v/c Ratio	0.63	0.16	0.83	0.21	0.65	0.42
Control Delay	62.6	16.3	9.4	0.4	49.4	2.4
Queue Delay	0.0	0.0	2.1	0.4	0.0	0.0
Total Delay	62.6	16.3	11.5	0.8	49.4	2.5
LOS	E	B	B	A	D	A
Approach Delay	52.9		10.3			6.6
Approach LOS	D		B			A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 10.8
 Intersection Capacity Utilization 76.8%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 18: Iona & E Henrietta



Timings
21: Crittenden Blvd & Kendrick

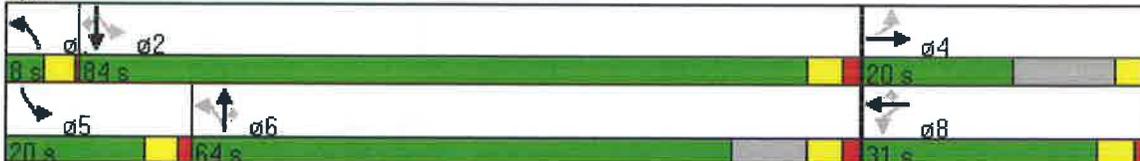
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	49	35	59	190	142	85	216	72	167	563	462
Turn Type	Perm		Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases		4		8		1	6		5	2	
Permitted Phases	4		8		8	6		6	2		2
Detector Phase	4	4	8	8	8	1	6	6	5	2	2
Switch Phase											
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	4.0	10.0	10.0	6.0	10.0	10.0
Minimum Split (s)	20.0	20.0	31.0	31.0	31.0	8.0	32.0	32.0	20.0	32.0	32.0
Total Split (s)	20.0	20.0	31.0	31.0	31.0	8.0	64.0	64.0	20.0	84.0	84.0
Total Split (%)	16.3%	16.3%	25.2%	25.2%	25.2%	6.5%	52.0%	52.0%	16.3%	68.3%	68.3%
Yellow Time (s)	3.5	3.5	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	2.0	2.0	0.5	2.0	2.0	1.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0	-1.0	-2.0	-3.0	-3.0	-2.0	-3.0	-3.0
Total Lost Time (s)	1.0	1.0	3.0	3.0	5.0	2.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes					
Recall Mode	None	None	Min	Min	Min	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	28.8	28.8		26.8	24.8	83.8	76.2	76.2	89.8	81.7	81.7
Actuated g/C Ratio	0.23	0.23		0.22	0.20	0.68	0.62	0.62	0.73	0.66	0.66
v/c Ratio	0.45	0.13		0.80	0.37	0.20	0.22	0.08	0.24	0.54	0.52
Control Delay	53.6	30.2		63.5	8.8	6.0	11.5	2.5	6.0	13.2	13.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	2.2	1.4
Total Delay	53.6	30.2		63.5	8.8	6.0	11.5	2.5	6.0	15.3	14.6
LOS	D	C		E	A	A	B	A	A	B	B
Approach Delay		42.2		43.6			8.5			13.7	
Approach LOS		D		D			A			B	

Intersection Summary

Cycle Length: 123
 Actuated Cycle Length: 123
 Offset: 95 (77%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 19.8
 Intersection Capacity Utilization 64.3%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings
22: ELMWOOD AVENUE & Kendrick

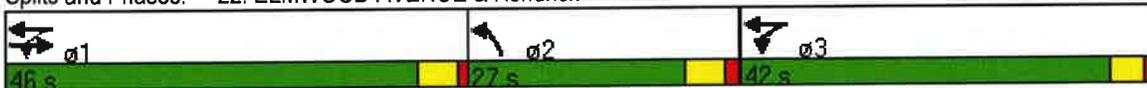


Lane Group	EBT	WBL	WBT	NBL
Lane Configurations	↑↑	↖	↑↑	↗↘
Volume (vph)	634	540	433	231
Turn Type		pm+pt		
Protected Phases	1	3	1 3	2
Permitted Phases		1 3		
Detector Phase	1	3	1 3	2
Switch Phase				
Minimum Initial (s)	15.0	4.0		10.0
Minimum Split (s)	34.0	10.0		26.0
Total Split (s)	46.0	42.0	88.0	27.0
Total Split (%)	40.0%	36.5%	76.5%	23.5%
Yellow Time (s)	4.0	3.5		4.0
All-Red Time (s)	1.0	1.5		1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lead			Lag
Lead-Lag Optimize?				
Recall Mode	C-Max	None		None
Act Effct Green (s)	47.6	86.1	89.1	19.9
Actuated g/C Ratio	0.41	0.75	0.77	0.17
v/c Ratio	0.94	0.91	0.18	0.68
Control Delay	40.6	50.5	3.6	32.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	40.6	50.5	3.6	32.5
LOS	D	D	A	C
Approach Delay	40.6		29.6	32.5
Approach LOS	D		C	C

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 35.3
 Intersection Capacity Utilization 91.0%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 22: ELMWOOD AVENUE & Kendrick



						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	37	21	450	153	140	484
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	41	23	500	170	156	538
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						795
pX, platoon unblocked	0.89					
vC, conflicting volume	1434	585			670	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1426	585			670	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	63	95			83	
cM capacity (veh/h)	111	511			920	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	41	23	670	156	538	
Volume Left	41	0	0	156	0	
Volume Right	0	23	170	0	0	
cSH	111	511	1700	920	1700	
Volume to Capacity	0.37	0.05	0.39	0.17	0.32	
Queue Length 95th (ft)	38	4	0	15	0	
Control Delay (s)	55.6	12.4	0.0	9.7	0.0	
Lane LOS	F	B		A		
Approach Delay (s)	39.9		0.0	2.2		
Approach LOS	E					
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization			54.1%	ICU Level of Service	A	
Analysis Period (min)			15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Volume (veh/h)	1	54	87	844	484	37	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	1	60	97	938	538	41	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type				None	None		
Median storage (veh)							
Upstream signal (ft)						957	
pX, platoon unblocked	0.91	0.91	0.91				
vC, conflicting volume	1689	558	579				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1708	467	489				
iC, single (s)	6.4	6.2	4.1				
iC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	99	89	90				
cM capacity (veh/h)	82	543	979				
Direction, Lane #	EB 1	NB 1	NB 2	SB 1			
Volume Total	61	97	938	579			
Volume Left	1	97	0	0			
Volume Right	60	0	0	41			
cSH	493	979	1700	1700			
Volume to Capacity	0.12	0.10	0.55	0.34			
Queue Length 95th (ft)	11	8	0	0			
Control Delay (s)	13.3	9.1	0.0	0.0			
Lane LOS	B	A					
Approach Delay (s)	13.3	0.8	0.0				
Approach LOS	B						
Intersection Summary							
Average Delay			1.0				
Intersection Capacity Utilization			54.5%	ICU Level of Service	A		
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis University of Rochester < October 2011 Revision
 27: Westmoreland & Kendrick 7/9/2013

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	1	10	29	19	23	139	261	796	40	95	285	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	11	32	21	25	151	284	865	43	103	310	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						8						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								452				
pX, platoon unblocked	0.24	0.24		0.24	0.24	0.24				0.24		
vC, conflicting volume	2059	1993	310	2008	1972	887	311			909		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3815	3540	310	3601	3453	0	311			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	96	0	0	42	77			74		
cM capacity (veh/h)	0	1	730	0	1	262	1250			392		
Direction, Lane #	SE 1	NW 1	NE 1	SW 1	SW 2							
Volume Total	43	197	1192	103	311							
Volume Left	1	21	284	103	0							
Volume Right	32	151	43	0	1							
cSH	0	0	1250	392	1700							
Volume to Capacity	Err	1428.63	0.23	0.26	0.18							
Queue Length 95th (ft)	Err	Err	22	26	0							
Control Delay (s)	Err	Err	5.3	17.4	0.0							
Lane LOS	F	F	A	C								
Approach Delay (s)	Err	Err	5.3	4.3								
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			92.7%		ICU Level of Service					F		
Analysis Period (min)			15									

Timings
91: Elmwood Ave &



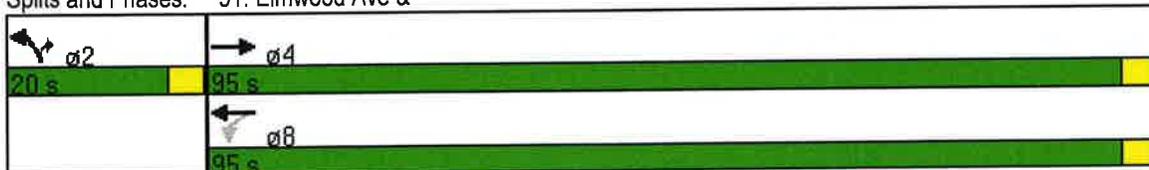
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↖	↑↑	↖	↗
Volume (vph)	756	243	1177	91	164
Turn Type		Perm			Perm
Protected Phases	4		8	2	
Permitted Phases		8			2
Detector Phase	4	8	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	95.0	95.0	95.0	20.0	20.0
Total Split (%)	82.6%	82.6%	82.6%	17.4%	17.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	C-Max	C-Max	Min	Min
Act Effct Green (s)	95.2	95.2	95.2	11.8	11.8
Actuated g/C Ratio	0.83	0.83	0.83	0.10	0.10
v/c Ratio	0.32	0.58	0.45	0.56	0.56
Control Delay	1.7	6.5	2.2	60.2	13.7
Queue Delay	0.6	0.0	0.0	0.0	0.0
Total Delay	2.4	6.5	2.2	60.2	13.7
LOS	A	A	A	E	B
Approach Delay	2.4		2.9	30.3	
Approach LOS	A		A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 50 (43%), Referenced to phase 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.5
 Intersection Capacity Utilization 51.7%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 91: Elmwood Ave &





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	40	20	358	92	50	584
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	22	389	100	54	635
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						414
pX, platoon unblocked	0.81					
vC, conflicting volume	1183	439			489	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1107	439			489	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	96			95	
cM capacity (veh/h)	178	618			1074	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	65	489	689
Volume Left	43	0	54
Volume Right	22	100	0
cSH	234	1700	1074
Volume to Capacity	0.28	0.29	0.05
Queue Length 95th (ft)	28	0	4
Control Delay (s)	26.3	0.0	1.3
Lane LOS	D		A
Approach Delay (s)	26.3	0.0	1.3
Approach LOS	D		

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		71.4%	ICU Level of Service C
Analysis Period (min)		15	



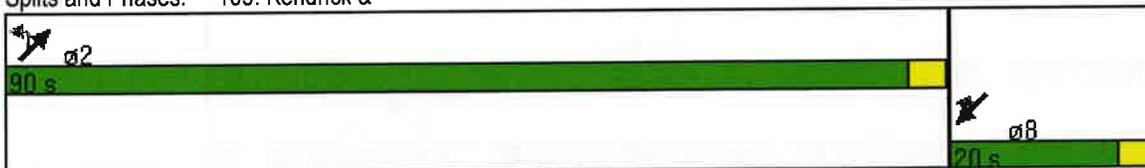
Lane Group	NEL	NET	SWT	SWR
Lane Configurations				
Volume (vph)	82	1099	281	76
Turn Type	Perm			Perm
Protected Phases		2	8	
Permitted Phases	2			8
Detector Phase	2	2	8	8
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0
Total Split (s)	90.0	90.0	20.0	20.0
Total Split (%)	81.8%	81.8%	18.2%	18.2%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effect Green (s)	86.0	86.0	16.0	16.0
Actuated g/C Ratio	0.78	0.78	0.15	0.15
v/c Ratio	1.32	0.84	1.15	0.31
Control Delay	237.1	14.5	144.6	22.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	237.1	14.5	144.6	22.4
LOS	F	B	F	C
Approach Delay		30.0	118.7	
Approach LOS		C	F	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NETL and 6:, Start of Green
 Natural Cycle: 80
 Control Type: Pretimed
 Maximum v/c Ratio: 1.32
 Intersection Signal Delay: 50.5
 Intersection Capacity Utilization 61.2%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service B

Splits and Phases: 109: Kendrick &



Timings
162: ELMWOOD AVENUE & South

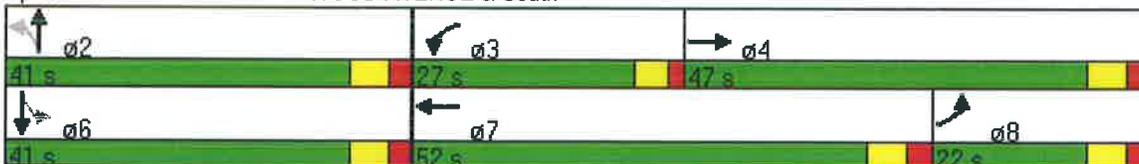


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↕	↗	↕		↕		↕
Volume (vph)	187	508	197	1158	4	525	48	400
Turn Type	custom		Prot		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	8				2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	22.0	47.0	27.0	52.0	41.0	41.0	41.0	41.0
Total Split (%)	19.1%	40.9%	23.5%	45.2%	35.7%	35.7%	35.7%	35.7%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?								
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	19.0	46.9	21.1	49.0		38.0		38.0
Actuated g/C Ratio	0.17	0.41	0.18	0.43		0.33		0.33
v/c Ratio	0.71	0.41	0.68	0.89		0.66		0.82
Control Delay	30.4	9.8	54.3	39.0		21.5		42.1
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	30.4	9.8	54.3	39.0		21.5		42.1
LOS	C	A	D	D		C		D
Approach Delay		15.2		41.2		21.5		42.1
Approach LOS		B		D		C		D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 32.0
 Intersection Capacity Utilization 93.9%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service F

Splits and Phases: 162: ELMWOOD AVENUE & South



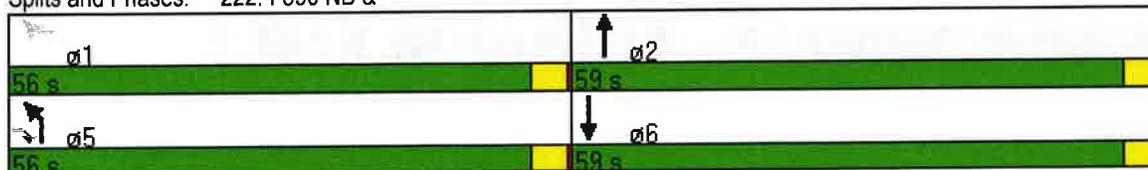


Lane Group	EBR	WBR	NBL	NBT	SBT	SBR2
Lane Configurations	↗	↗↗	↖↖	↑↑	↑↑	↗
Volume (vph)	579	875	214	1181	1175	78
Turn Type	custom	custom	Prot			Free
Protected Phases			5	2	6!	
Permitted Phases	5	1!				Free
Detector Phase	5	1	5	2	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	
Total Split (s)	56.0	56.0	56.0	59.0	59.0	0.0
Total Split (%)	48.7%	48.7%	48.7%	51.3%	51.3%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	C-Max	C-Max	
Act Effct Green (s)	48.0	46.0	48.0	61.0	59.0	115.0
Actuated g/C Ratio	0.42	0.40	0.42	0.53	0.51	1.00
v/c Ratio	0.91	0.85	0.16	0.68	0.70	0.05
Control Delay	48.7	39.3	23.4	8.2	20.5	0.1
Queue Delay	0.0	0.0	0.0	0.3	0.4	0.0
Total Delay	48.7	39.3	23.4	8.5	20.9	0.1
LOS	D	D	C	A	C	A
Approach Delay				10.8	19.6	
Approach LOS				B	B	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 24.9
 Intersection Capacity Utilization 79.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D
 ! Phase conflict between lane groups.

Splits and Phases: 222: I-390 NB &





Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↓	↘	↑↑	↘	↗
Volume (vph)	801	54	936	36	26
Turn Type		pm+pt			Perm
Protected Phases	1	3	1 3	2	
Permitted Phases		1 3			2
Detector Phase	1	3	1 3	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	71.0	13.0	84.0	31.0	31.0
Total Split (%)	61.7%	11.3%	73.0%	27.0%	27.0%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effct Green (s)	68.0	78.0	81.0	28.0	28.0
Actuated g/C Ratio	0.59	0.68	0.70	0.24	0.24
v/c Ratio	0.45	0.14	0.42	0.09	0.07
Control Delay	14.6	3.1	5.6	34.5	12.3
Queue Delay	0.0	0.0	0.6	0.0	0.0
Total Delay	14.6	3.1	6.1	34.5	12.3
LOS	B	A	A	C	B
Approach Delay	14.6		6.0	25.2	
Approach LOS	B		A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay: 10.4
 Intersection Capacity Utilization 41.7%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 393: ELMWOOD AVENUE & U of R



Timings
395: Crittenden Blvd & East Dr

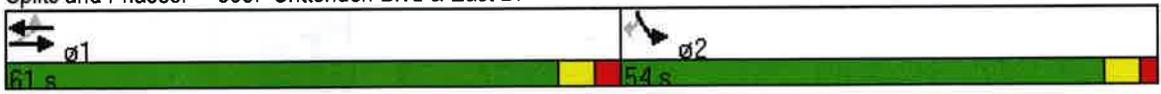


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↖	↕	↕	↖	↗
Volume (vph)	71	308	575	95	107
Turn Type	Perm				Perm
Protected Phases		1	1	2	
Permitted Phases	1				2
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	15.0	15.0
Total Split (s)	61.0	61.0	61.0	54.0	54.0
Total Split (%)	53.0%	53.0%	53.0%	47.0%	47.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	93.2	93.2	93.2	15.8	15.8
Actuated g/C Ratio	0.81	0.81	0.81	0.14	0.14
v/c Ratio	0.16	0.12	0.29	0.44	0.37
Control Delay	3.7	2.6	5.1	50.4	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	2.6	5.1	50.4	10.9
LOS	A	A	A	D	B
Approach Delay		2.8	5.1	29.5	
Approach LOS		A	A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.44
 Intersection Signal Delay: 8.2
 Intersection Capacity Utilization 42.0%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	25	1	61	2	166	1605	41	1127
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	14.0	39.0	14.0	39.0
Total Split (s)	32.0	32.0	32.0	32.0	14.0	69.0	14.0	69.0
Total Split (%)	27.8%	27.8%	27.8%	27.8%	12.2%	60.0%	12.2%	60.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	13.2	13.2	13.2	13.2	92.8	81.1	92.8	81.1
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.81	0.71	0.81	0.71
v/c Ratio	0.43	0.08	0.43	0.61	0.48	0.77	0.18	0.54
Control Delay	66.4	20.8	54.5	21.8	11.2	11.6	11.7	1.3
Queue Delay	0.7	0.0	0.0	0.6	0.0	0.7	0.0	0.4
Total Delay	67.2	20.8	54.5	22.3	11.2	12.3	11.7	1.8
LOS	E	C	D	C	B	B	B	A
Approach Delay		51.0		30.7		12.2		2.1
Approach LOS		D		C		B		A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 10.2
 Intersection Capacity Utilization 79.9%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 470: MCH & E Henrietta



Timings
500: Crittenden & E Henrietta



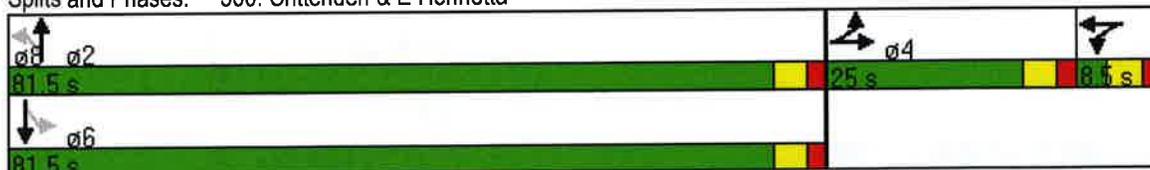
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	333	9	1	48	815	27	1390
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	25.0	25.0	8.5	81.5	81.5	81.5	81.5
Total Split (%)	21.7%	21.7%	7.4%	70.9%	70.9%	70.9%	70.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	21.1	21.1	6.0	84.5	84.5	84.5	84.5
Actuated g/C Ratio	0.18	0.18	0.05	0.73	0.73	0.73	0.73
v/c Ratio	0.80	0.74	0.05	0.79	0.35	0.08	1.05
Control Delay	64.7	53.0	0.3	85.3	6.4	6.6	47.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	15.2
Total Delay	64.7	53.0	0.3	85.3	6.4	6.6	62.8
LOS	E	D	A	F	A	A	E
Approach Delay		59.0	0.3		10.8		62.1
Approach LOS		E	A		B		E

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.05
 Intersection Signal Delay: 49.6
 Intersection Capacity Utilization 96.2%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 500: Crittenden & E Henrietta



Timings
501: Southland Drive & West Henrietta Road

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	35	1	7	1	1	1108	72	1417
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	74.0	74.0	14.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	67.3%	67.3%	12.7%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		10.6		10.6	86.9	86.9	95.5	96.1
Actuated g/C Ratio		0.10		0.10	0.79	0.79	0.87	0.87
v/c Ratio		0.30		0.15	0.00	0.45	0.20	0.52
Control Delay		45.7		27.1	3.0	8.0	3.8	6.3
Queue Delay		0.0		0.0	0.0	0.1	0.0	0.2
Total Delay		45.7		27.1	3.0	8.1	3.8	6.5
LOS		D		C	A	A	A	A
Approach Delay		45.7		27.1		8.1		6.4
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 7.9
 Intersection Capacity Utilization 58.3%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 501: Southland Drive & West Henrietta Road



Timings
502: Doncaster Road & West Henrietta Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕↕		↕↕
Volume (vph)	10	1	3	2	1	1114	10	1414
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)		6.4		6.4		104.6		104.6
Actuated g/C Ratio		0.06		0.06		0.95		0.95
v/c Ratio		0.12		0.14		0.39		0.50
Control Delay		48.3		33.9		2.6		2.8
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		48.3		33.9		2.6		2.9
LOS		D		C		A		A
Approach Delay		48.3		33.9		2.6		2.9
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 75 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.50
 Intersection Signal Delay: 3.1
 Intersection Capacity Utilization 56.2%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 502: Doncaster Road & West Henrietta Road



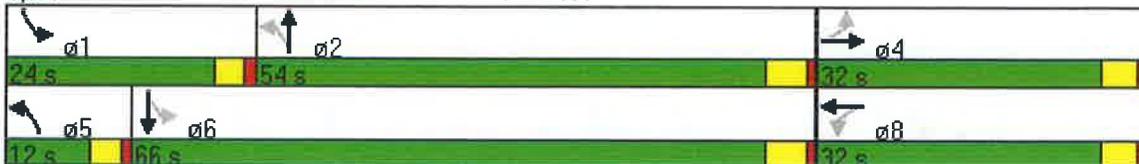


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔	↔	↔	↔	↔
Volume (vph)	102	170	215	40	23	777	328	1066
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	9.0	25.0	8.0	25.0
Total Split (s)	32.0	32.0	32.0	32.0	12.0	54.0	24.0	66.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	10.9%	49.1%	21.8%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)		25.7		25.7	64.7	57.6	78.3	72.1
Actuated g/C Ratio		0.23		0.23	0.59	0.52	0.71	0.66
v/c Ratio		0.95dl		0.87	0.08	0.56	0.78	0.52
Control Delay		51.2		40.3	9.2	31.8	27.7	15.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		51.2		40.3	9.2	31.8	27.7	15.5
LOS		D		D	A	C	C	B
Approach Delay		51.2		40.3		31.2		18.3
Approach LOS		D		D		C		B

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 29.0
 Intersection Capacity Utilization 82.1%
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 503: Crittenden & West Henrietta Road



Timings
504: BHTL & West Henrietta Road

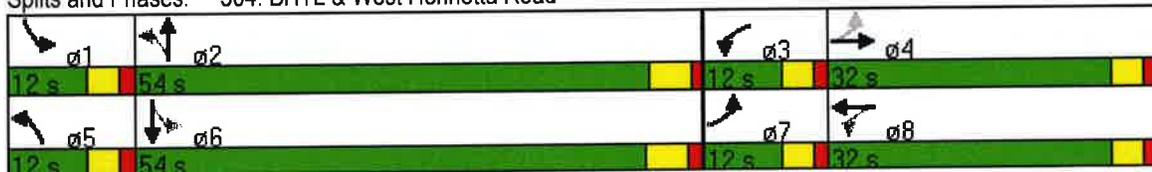


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	148	333	121	299	36	700	205	929
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	12.0	32.0	12.0	32.0	12.0	54.0	12.0	54.0
Total Split (%)	10.9%	29.1%	10.9%	29.1%	10.9%	49.1%	10.9%	49.1%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	29.2	20.2	29.2	20.2	64.0	56.0	71.8	64.9
Actuated g/C Ratio	0.27	0.18	0.27	0.18	0.58	0.51	0.65	0.59
v/c Ratio	0.72	0.60	0.54	0.66	0.15	0.56	0.59	0.62
Control Delay	48.6	44.2	37.7	42.9	9.4	19.9	25.0	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	44.2	37.7	42.9	9.4	19.9	25.0	27.3
LOS	D	D	D	D	A	B	C	C
Approach Delay		45.5		41.6		19.5		27.0
Approach LOS		D		D		B		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 30.0
 Intersection Capacity Utilization 69.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 504: BHTL & West Henrietta Road





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		+			+
Volume (veh/h)	58	8	388	113	2	159
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	64	9	431	126	2	177
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	675	494			557	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	675	494			557	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	98			100	
cM capacity (veh/h)	418	575			1014	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	73	557	179
Volume Left	64	0	2
Volume Right	9	126	0
cSH	432	1700	1014
Volume to Capacity	0.17	0.33	0.00
Queue Length 95th (ft)	15	0	0
Control Delay (s)	15.0	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	15.0	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		37.7%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Volume (veh/h)	1208	138	158	791	76	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1313	150	172	860	83	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	681			1233		
pX, platoon unblocked					0.82	
vC, conflicting volume			1463		2161	732
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1463		1973	732
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			62		0	90
cM capacity (veh/h)			458		28	364

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	875	588	458	573	83	37
Volume Left	0	0	172	0	83	0
Volume Right	0	150	0	0	0	37
cSH	1700	1700	458	1700	28	364
Volume to Capacity	0.51	0.35	0.38	0.34	2.98	0.10
Queue Length 95th (ft)	0	0	43	0	249	8
Control Delay (s)	0.0	0.0	11.5	0.0	1189.9	16.0
Lane LOS			B		F	C
Approach Delay (s)	0.0		5.1		827.1	
Approach LOS					F	

Intersection Summary						
Average Delay			39.8			
Intersection Capacity Utilization			78.5%		ICU Level of Service	D
Analysis Period (min)			15			

Intersection								
Intersection Delay (sec/veh)	3.2							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		1		2	
Conflicting Circle Lanes	2		2		2		2	
Adjusted Approach Flow (vph)	365		1396		95		327	
Demand Flow Rate (pc/h)	373		1424		97		334	
Vehicles Circulating (pc/h)	287		257		572		306	
Vehicles Exiting (pc/h)	353		412		88		247	
Follow-Up Headway (s)	3.186		3.186		3.186		3.186	
Ped Vol. Crossing Leg (#/hr)	0		0		0		0	
Ped Capacity Adjustment	1.000		1.000		1.000		1.000	
Approach Delay (sec/veh)	6.1		1.5		6.2		6.5	
Approach LOS	A		A		A		A	
Lane	Left	Right	Left	Bypass	Left	Left	Right	
Designated moves	LT	TR	LT	R	LTR	LT	R	
Assumed Moves	L	TR	LT	R	LTR	LT	R	
Right Turn Channelized	Free							
Lane Utilization	0.552	0.448	1.000		1.000	0.746	0.254	
Critical Headway (s)	4.293	4.113	4.293		4.113	4.293	4.113	
Entry Flow Rate (pc/h)	206	167	296	1128	97	249	85	
Capacity, Entry Lane (pc/h)	911	924	932	1938	757	898	912	
Entry HV Adjustment Factor	0.981	0.979	0.980	0.980	0.981	0.979	0.976	
Flow Rate, Entry (vph)	202	163	290	1106	95	244	83	
Capacity, Entry (vph)	893	905	913	1900	743	879	891	
Volume to Capacity Ratio	0.226	0.181	0.318	0.582	0.128	0.277	0.093	
Control Delay (sec/veh)	6.3	5.8	7.4	0.0	6.2	7.0	4.9	
Level of Service	A	A	A	A	A	A	A	
95th-Percentile Queue (veh)	1	1	1	4	0	1	0	

PM Peak Hour

Build Conditions 5-Year

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HCM Unsignalized Intersection Capacity Analysis University of Rochester, October 2011 Revision
 1: East River Road & Kendrick 7/11/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized						Yes						
Volume (veh/h)	93	96	60	28	112	387	14	19	60	592	26	179
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	103	107	67	31	124	430	16	21	67	658	29	199
Approach Volume (veh/h)		277			156			103			886	
Crossing Volume (veh/h)		718			140			868			171	
High Capacity (veh/h)		783			1241			694			1211	
High v/c (veh/h)		0.35			0.13			0.15			0.73	
Low Capacity (veh/h)		622			1031			544			1004	
Low v/c (veh/h)		0.44			0.15			0.19			0.88	
Intersection Summary												
Maximum v/c High			0.73									
Maximum v/c Low			0.88									
Intersection Capacity Utilization			73.2%		ICU Level of Service					D		

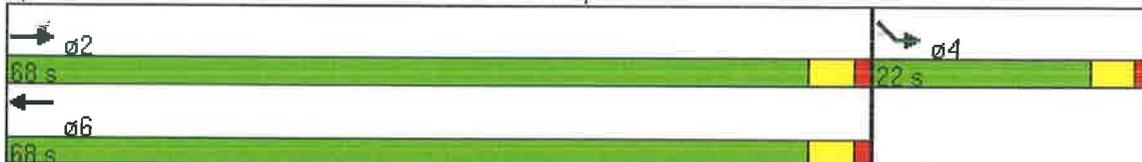
Timings
2: East River Road & I-390 S On Ramp

Lane Group	EBL	EBT	WBT	SEL	SER
Lane Configurations					
Volume (vph)	526	222	370	609	157
Turn Type	Perm				Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0
Minimum Split (s)	20.0	20.0	20.0	10.0	10.0
Total Split (s)	68.0	68.0	68.0	22.0	22.0
Total Split (%)	75.6%	75.6%	75.6%	24.4%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	-2.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	3.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effect Green (s)	50.7	50.7	50.7	19.0	16.9
Actuated g/C Ratio	0.65	0.65	0.65	0.24	0.22
v/c Ratio	0.93	0.89dl	0.44	0.81	0.36
Control Delay	51.7	7.8	6.9	40.3	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	7.8	6.9	40.3	7.9
LOS	D	A	A	D	A
Approach Delay		23.1	6.9	33.7	
Approach LOS		C	A	C	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 78.2
 Natural Cycle: 50
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 20.8
 Intersection LOS: C
 Intersection Capacity Utilization 68.7%
 ICU Level of Service C
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: East River Road & I-390 S On Ramp



Timings
3: College Town & Mt. Hope



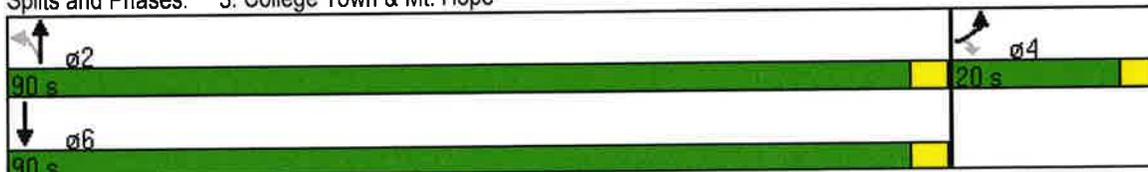
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	36	97	84	1390	1308
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	90.0	90.0	90.0
Total Split (%)	18.2%	18.2%	81.8%	81.8%	81.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	8.2	8.2	93.8	93.8	93.8
Actuated g/C Ratio	0.07	0.07	0.85	0.85	0.85
v/c Ratio	0.30	0.53	0.37	0.51	0.49
Control Delay	53.0	23.0	10.6	8.4	0.9
Queue Delay	0.0	0.0	0.0	0.7	0.2
Total Delay	53.0	23.0	10.6	9.1	1.1
LOS	D	C	B	A	A
Approach Delay	31.1			9.2	1.1
Approach LOS	C			A	A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 6.5
 Intersection Capacity Utilization 55.1%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 3: College Town & Mt. Hope



Intersection Sign configuration not allowed in HCM analysis.

Timings
6: East River Road & Mt. Hope

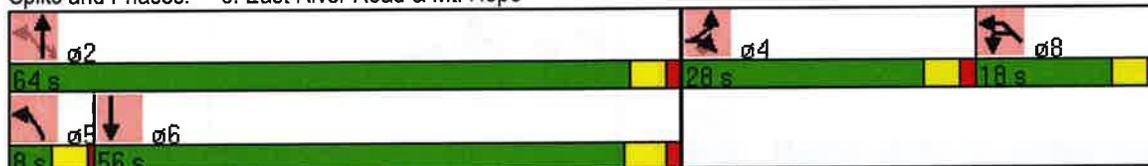


Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBT	NWL2	NWL
Lane Configurations									
Volume (vph)	257	267	334	90	1368	303	920	151	231
Turn Type		Prot	Perm	pm+pt		Perm		Split	
Protected Phases	4	4		5	2		6	8	8
Permitted Phases			4	2		2			
Detector Phase	4	4	4	5	2	2	6	8	8
Switch Phase									
Minimum Initial (s)	3.0	3.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	15.0	15.0	15.0	8.0	29.0	29.0	25.5	15.0	15.0
Total Split (s)	28.0	28.0	28.0	8.0	64.0	64.0	56.0	18.0	18.0
Total Split (%)	25.5%	25.5%	25.5%	7.3%	58.2%	58.2%	50.9%	16.4%	16.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	0.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.5	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	2.0	3.0	4.0	3.0	3.0	3.0
Lead/Lag				Lead			Lag		
Lead-Lag Optimize?				Yes					
Recall Mode	None	None	None	Min	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	23.0	23.0	23.0	64.4	63.4	62.4	54.7	14.6	14.6
Actuated g/C Ratio	0.21	0.21	0.21	0.59	0.58	0.57	0.50	0.13	0.13
v/c Ratio	0.77	0.83	0.51	0.56	0.52	0.32	0.82	0.72	0.75
Control Delay	55.5	51.1	16.9	26.3	21.3	6.4	19.2	63.6	49.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	51.1	16.9	26.3	21.3	6.4	19.2	63.6	49.7
LOS	E	D	B	C	C	A	B	E	D
Approach Delay	44.4				19.0		19.2		54.1
Approach LOS	D				B		B		D

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 27.9
 Intersection Capacity Utilization 78.9%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 6: East River Road & Mt. Hope



Timings
8: I-390 SB Ramp & E Henrietta

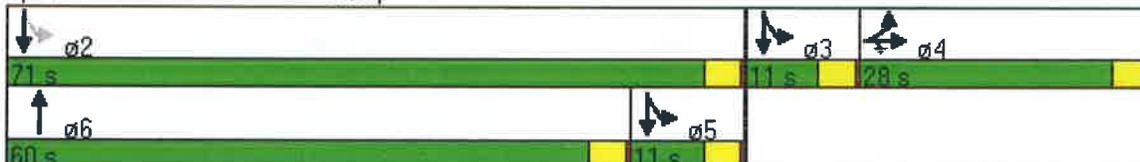
								ø2	ø3	ø5
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	ø2	ø3	ø5
Lane Configurations										
Volume (vph)	222	436	494	1343	789	475	1274			
Turn Type	Split		Perm		Free	pm+pt				
Protected Phases	4	4		6		3 5	2 3 5	2	3	5
Permitted Phases			4		Free	2 3 5				
Detector Phase	4	4	4	6		3 5	2 3 5			
Switch Phase										
Minimum Initial (s)	3.0	3.0	3.0	4.0				4.0	4.0	3.0
Minimum Split (s)	25.0	25.0	25.0	20.0				20.0	20.0	8.0
Total Split (s)	28.0	28.0	28.0	60.0	0.0	22.0	93.0	71.0	11.0	11.0
Total Split (%)	25.5%	25.5%	25.5%	54.5%	0.0%	20.0%	84.5%	65%	10%	10%
Yellow Time (s)	3.5	3.5	3.5	3.5				3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5				0.5	0.5	0.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0			
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lead/Lag	Lag	Lag	Lag	Lead					Lead	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	C-Max				C-Max	None	Min
Act Effct Green (s)	25.0	25.0	25.0	57.0	110.0	79.0	79.0			
Actuated g/C Ratio	0.23	0.23	0.23	0.52	1.00	0.72	0.72			
v/c Ratio	0.61	1.00	0.85	0.81	0.55	0.73	0.56			
Control Delay	44.3	71.8	49.7	26.6	1.4	35.3	8.9			
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0			
Total Delay	44.3	71.8	49.7	27.0	1.4	35.3	8.9			
LOS	D	E	D	C	A	D	A			
Approach Delay		61.4		17.5			16.1			
Approach LOS		E		B			B			

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 73 (66%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 27.1
 Intersection Capacity Utilization 76.5%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 8: I-390 SB Ramp & E Henrietta



Timings
10: Westfall & E Henrietta

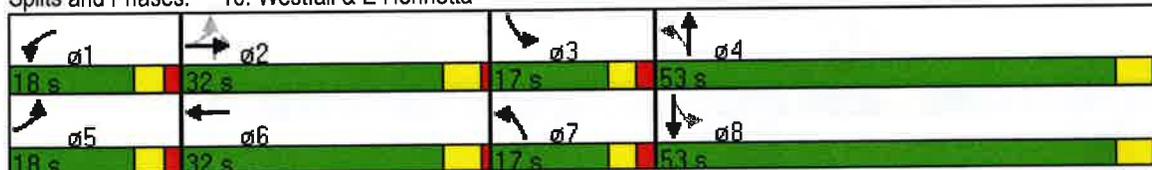


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	129	374	395	319	148	1048	232	254	1253
Turn Type	pm+pt		Prot		pm+pt		custom	pm+pt	
Protected Phases	5	2	1	6	7	4		3	8
Permitted Phases	2				4		2	8	
Detector Phase	5	2	1	6	7	4	2	3	8
Switch Phase									
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	10.0	7.0	5.0	7.0
Minimum Split (s)	10.0	32.0	10.0	32.0	10.0	32.0	32.0	10.0	32.0
Total Split (s)	18.0	32.0	18.0	32.0	17.0	53.0	32.0	17.0	53.0
Total Split (%)	15.0%	26.7%	15.0%	26.7%	14.2%	44.2%	26.7%	14.2%	44.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	1.0	2.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	C-Max	None	Max
Act Effct Green (s)	44.0	29.0	15.0	29.0	64.0	50.0	28.0	64.0	50.0
Actuated g/C Ratio	0.37	0.24	0.12	0.24	0.53	0.42	0.23	0.53	0.42
v/c Ratio	0.45	0.70	1.02	0.64	0.61	0.79	0.53	1.04	1.01
Control Delay	29.1	42.6	101.1	37.5	32.8	35.2	21.3	99.8	60.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	31.1	0.0	0.0	0.0
Total Delay	29.1	42.6	101.1	37.5	32.8	66.4	21.3	99.8	60.4
LOS	C	D	F	D	C	E	C	F	E
Approach Delay		40.0		65.4		55.6			66.7
Approach LOS		D		E		E			E

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 59.1
 Intersection Capacity Utilization 85.6%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service E

Splits and Phases: 10: Westfall & E Henrietta



Timings
11: South & E Henrietta

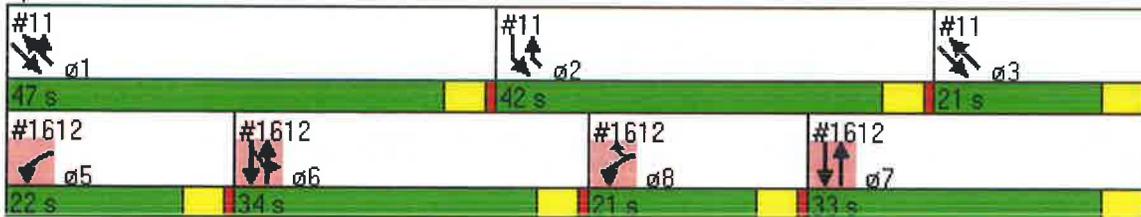
Lane Group	SBL	SET	NWT	NWR	ø1	ø3	ø5	ø6	ø7	ø8
Lane Configurations										
Volume (vph)	656	816	708	642						
Turn Type				custom						
Protected Phases	2	13	13	12	1	3	5	6	7	8
Permitted Phases		13		12						
Detector Phase	2	13	13	12						
Switch Phase										
Minimum Initial (s)	10.0				24.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	21.0	33.0	33.0	13.0
Total Split (s)	42.0	68.0	68.0	89.0	47.0	21.0	22.0	34.0	33.0	21.0
Total Split (%)	38.2%	61.8%	61.8%	80.9%	43%	19%	20%	31%	30%	19%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0						
Total Lost Time (s)	3.0	3.0	3.0	3.0						
Lead/Lag	Lag				Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None				C-Max	None	C-Max	None	None	None
Act Effct Green (s)	34.1	69.9	69.9	81.8						
Actuated g/C Ratio	0.31	0.64	0.64	0.74						
v/c Ratio	0.68	0.44	0.67	0.52						
Control Delay	32.1	17.6	17.2	1.7						
Queue Delay	1.6	0.0	0.4	0.0						
Total Delay	33.6	17.6	17.6	1.7						
LOS	C	B	B	A						
Approach Delay	33.6	17.6	10.1							
Approach LOS	C	B	B							

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NWSE and 5:, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 17.7
 Intersection Capacity Utilization 62.6%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 11: South & E Henrietta



Timings
12: Crittenden Blvd & Mt. Hope



Lane Group	EBL	EBR	EBR2	NBL	NBT	SBL	SBT	NWL	NWR	ø4	ø7
Lane Configurations											
Volume (vph)	206	292	225	146	809	409	939	142	458		
Turn Type		Perm	Perm	pm+pt		pm+pt			custom		
Protected Phases	8			5	2	1	6	3	31	4	7
Permitted Phases		8	8	2		6			3		
Detector Phase	8	8	8	5	2	1	6	3	31		
Switch Phase											
Minimum Initial (s)	12.0	12.0	12.0	5.0	7.0	5.0	7.0	6.0		4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	12.0	27.0	12.0	27.0	16.0		20.0	8.0
Total Split (s)	22.0	22.0	22.0	12.0	33.0	28.0	49.0	17.0	45.0	32.0	10.0
Total Split (%)	20.0%	20.0%	20.0%	10.9%	30.0%	25.5%	44.5%	15.5%	40.9%	29%	9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		0.5	0.5
Lost Time Adjust (s)	-3.0	-3.0	-1.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lag				Lead
Lead-Lag Optimize?											Yes
Recall Mode	None	None	None	None	C-Max	None	C-Max	None		None	None
Act Effect Green (s)	29.1	29.1	27.1	39.0	30.0	58.0	46.0	13.9	38.9		
Actuated g/C Ratio	0.26	0.26	0.25	0.35	0.27	0.53	0.42	0.13	0.35		
v/c Ratio	0.49	0.77	0.64	0.72	0.96	0.97	0.75	0.75	0.74		
Control Delay	38.4	51.5	45.8	41.7	45.8	53.9	21.3	74.9	20.9		
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0		
Total Delay	38.6	51.5	45.8	41.7	45.8	53.9	21.8	74.9	21.0		
LOS	D	D	D	D	D	D	C	E	C		
Approach Delay	46.0				45.2		31.1	34.3			
Approach LOS	D				D		C	C			

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 67 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 38.2
 Intersection Capacity Utilization 78.8%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 12: Crittenden Blvd & Mt. Hope



Timings
13: Elmwood Ave & Mt. Hope



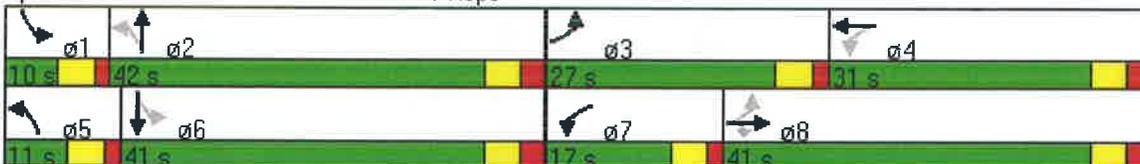
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↙	↕	↘	↙	↕	↙	↕	↙	↕
Volume (vph)	424	935	201	230	581	162	872	78	908
Turn Type	pm+pt		Perm	pm+pt		pm+pt		pm+pt	
Protected Phases	3	8		7	4	5	2	1	6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	7	4	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	4.0	7.0	4.0	7.0
Minimum Split (s)	12.0	31.0	31.0	12.0	31.0	10.0	33.0	10.0	33.0
Total Split (s)	27.0	41.0	41.0	17.0	31.0	11.0	42.0	10.0	41.0
Total Split (%)	24.5%	37.3%	37.3%	15.5%	28.2%	10.0%	38.2%	9.1%	37.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-1.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	54.6	37.7	35.7	41.4	27.6	47.8	41.4	45.0	38.0
Actuated g/C Ratio	0.50	0.34	0.32	0.38	0.25	0.43	0.38	0.41	0.35
v/c Ratio	1.03	0.86	0.36	0.87	0.76	0.88	1.07	0.48	1.03
Control Delay	74.2	38.1	9.9	56.5	44.4	68.0	68.0	26.9	70.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.2	38.1	9.9	56.5	44.4	68.0	68.0	26.9	70.3
LOS	E	D	A	E	D	E	E	C	E
Approach Delay		44.3			47.8		68.0		67.5
Approach LOS		D			D		E		E

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.07
 Intersection Signal Delay: 57.1
 Intersection Capacity Utilization 94.7%
 Analysis Period (min) 15

Intersection LOS: E
 ICU Level of Service F

Splits and Phases: 13: Elmwood Ave & Mt. Hope



Timings
14: Lattimore & Mt. Hope

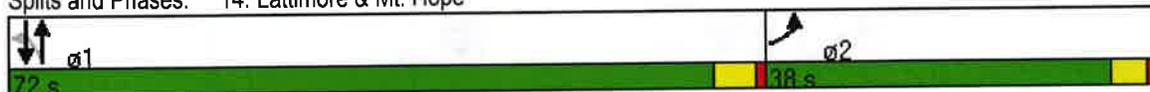


Lane Group	EBL	NBL	NBT	SBT
Lane Configurations	Y		↑↑	↑↑
Volume (vph)	102	35	878	1248
Turn Type	Perm			
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	27.0	24.0	24.0	24.0
Total Split (s)	38.0	72.0	72.0	72.0
Total Split (%)	34.5%	65.5%	65.5%	65.5%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	C-Max	C-Max	C-Max
Act Effect Green (s)	20.7		83.3	83.3
Actuated g/C Ratio	0.19		0.76	0.76
v/c Ratio	0.70		0.46	0.52
Control Delay	42.0		5.9	14.2
Queue Delay	0.0		0.0	0.0
Total Delay	42.0		5.9	14.2
LOS	D		A	B
Approach Delay	42.0		5.9	14.2
Approach LOS	D		A	B

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 13.7
 Intersection Capacity Utilization 70.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 14: Lattimore & Mt. Hope



Timings
15: Westfall & Mt. Hope

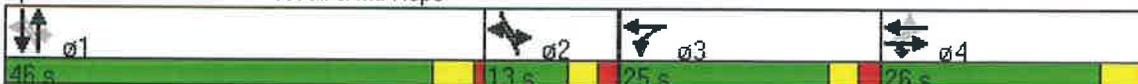
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	10	174	256	445	128	77	794	207	123	1229
Turn Type	Perm		custom	pm+pt		pm+pt		Perm	pm+pt	
Protected Phases		4	4	3	3 4	2	1		2	1
Permitted Phases	4		4	3 4		1		1	1	
Detector Phase	4	4	4	3	3 4	2	1	1	2	1
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	26.0	26.0	26.0	11.0		13.0	40.0	40.0	13.0	40.0
Total Split (s)	26.0	26.0	26.0	25.0	51.0	13.0	46.0	46.0	13.0	46.0
Total Split (%)	23.6%	23.6%	23.6%	22.7%	46.4%	11.8%	41.8%	41.8%	11.8%	41.8%
Yellow Time (s)	4.0	4.0	4.0	3.0		3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	1.0	2.0		2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	None	None	None		None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		20.2	20.2	44.1	47.1	53.9	45.8	44.8	53.9	45.8
Actuated g/C Ratio		0.18	0.18	0.40	0.43	0.49	0.42	0.41	0.49	0.42
v/c Ratio		0.61	0.67	0.97	0.34	0.43	0.60	0.29	0.50	0.93
Control Delay		49.0	25.3	60.8	17.9	18.7	12.7	1.6	23.8	41.5
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		49.0	25.3	60.8	17.9	18.7	12.7	1.6	23.8	41.5
LOS		D	C	E	B	B	B	A	C	D
Approach Delay		35.2			45.9		11.0			39.9
Approach LOS		D			D		B			D

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 31.7
 Intersection Capacity Utilization 86.2%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 15: Westfall & Mt. Hope



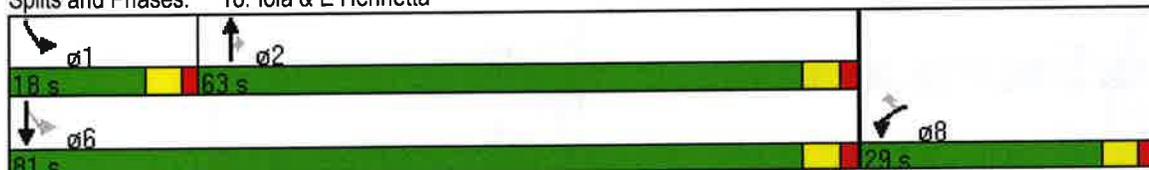


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↑↑	↗	↙	↑↑
Volume (vph)	194	221	1271	179	160	1722
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	21.5	21.5	9.0	21.5
Total Split (s)	29.0	29.0	63.0	63.0	18.0	81.0
Total Split (%)	26.4%	26.4%	57.3%	57.3%	16.4%	73.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.0	2.0	1.5	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)	18.1	18.1	64.7	64.7	80.9	80.4
Actuated g/C Ratio	0.16	0.16	0.59	0.59	0.74	0.73
v/c Ratio	0.74	0.55	0.68	0.20	0.60	0.74
Control Delay	58.6	11.8	7.8	0.4	22.6	13.5
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.3
Total Delay	58.6	11.8	7.8	0.4	22.6	13.7
LOS	E	B	A	A	C	B
Approach Delay	33.7		6.9			14.5
Approach LOS	C		A			B

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 13.7
 Intersection Capacity Utilization 68.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 18: Iola & E Henrietta



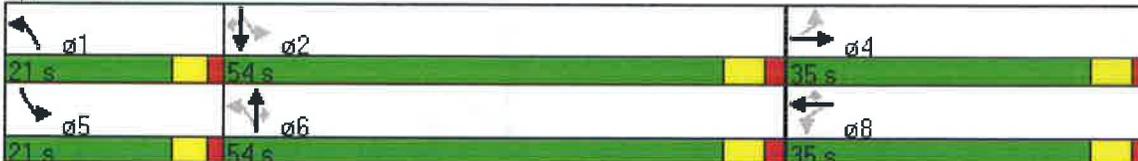
Timings
21: Crittenden Blvd & Kendrick

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	187	250	83	64	293	30	714	89	173	408	69
Turn Type	Perm		Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases		4		8		1	6		5	2	
Permitted Phases	4		8		8	6		6	2		2
Detector Phase	4	4	8	8	8	1	6	6	5	2	2
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	11.0	10.0	10.0	6.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	20.0	32.0	32.0	20.0	32.0	32.0
Total Split (s)	35.0	35.0	35.0	35.0	35.0	21.0	54.0	54.0	21.0	54.0	54.0
Total Split (%)	31.8%	31.8%	31.8%	31.8%	31.8%	19.1%	49.1%	49.1%	19.1%	49.1%	49.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.5	2.0	2.0	1.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0	-1.0	-2.0	-3.0	-3.0	-2.0	-3.0	-3.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	Min	Min	Min	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	29.5	29.5		29.5	27.5	70.2	57.6	57.6	71.7	58.5	58.5
Actuated g/C Ratio	0.27	0.27		0.27	0.25	0.64	0.52	0.52	0.65	0.53	0.53
v/c Ratio	0.82	0.74		0.94	0.53	0.06	0.87	0.12	0.61	0.49	0.10
Control Delay	63.0	45.7		95.6	6.9	7.2	37.2	9.2	35.2	7.1	6.0
Queue Delay	12.5	0.0		0.0	0.4	0.0	0.0	0.0	0.0	0.3	0.0
Total Delay	75.4	45.7		95.6	7.4	7.2	37.2	9.2	35.2	7.4	6.0
LOS	E	D		F	A	A	D	A	D	A	A
Approach Delay		56.9		36.8			33.1			14.6	
Approach LOS		E		D			C			B	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 33.7
 Intersection Capacity Utilization 85.5%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings
22: Elmwood Ave & Kendrick

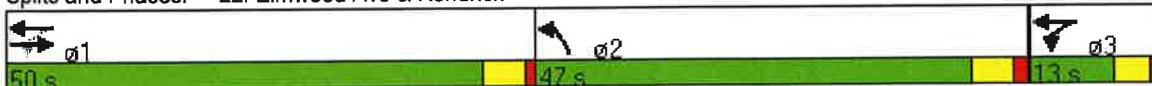


Lane Group	EBT	WBL	WBT	NBL
Lane Configurations	↑↑	↖	↑↑	↗↘
Volume (vph)	621	150	848	671
Turn Type		pm+pt		
Protected Phases	1	3	1 3	2
Permitted Phases		1 3		
Detector Phase	1	3	1 3	2
Switch Phase				
Minimum Initial (s)	15.0	4.0		10.0
Minimum Split (s)	34.0	10.0		26.0
Total Split (s)	50.0	13.0	63.0	47.0
Total Split (%)	45.5%	11.8%	57.3%	42.7%
Yellow Time (s)	4.0	3.5		4.0
All-Red Time (s)	1.0	1.5		1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lead			Lag
Lead-Lag Optimize?				
Recall Mode	C-Max	None		None
Act Effct Green (s)	47.0	57.2	60.2	43.8
Actuated g/C Ratio	0.43	0.52	0.55	0.40
v/c Ratio	0.80	0.72	0.49	0.92
Control Delay	26.9	55.0	13.5	32.2
Queue Delay	0.0	0.0	0.0	1.6
Total Delay	26.9	55.0	13.5	33.8
LOS	C	D	B	C
Approach Delay	26.9		19.8	33.8
Approach LOS	C		B	C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 27.2
 Intersection Capacity Utilization 86.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 22: Elmwood Ave & Kendrick





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	116	133	720	82	104	477
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	129	148	800	91	116	530
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						795
pX, platoon unblocked	0.91					
vC, conflicting volume	1607	846			891	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1617	846			891	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	59			85	
cM capacity (veh/h)	88	362			761	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	129	148	891	116	530	
Volume Left	129	0	0	116	0	
Volume Right	0	148	91	0	0	
cSH	88	362	1700	761	1700	
Volume to Capacity	1.46	0.41	0.52	0.15	0.31	
Queue Length 95th (ft)	248	48	0	13	0	
Control Delay (s)	342.3	21.6	0.0	10.6	0.0	
Lane LOS	F	C		B		
Approach Delay (s)	171.0		0.0	1.9		
Approach LOS	F					
Intersection Summary						
Average Delay			26.8			
Intersection Capacity Utilization			65.1%		ICU Level of Service	C
Analysis Period (min)			15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	85	44	781	567	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	94	49	868	630	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked	0.95	0.95	0.95			
vC, conflicting volume	1599	634	638			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1605	585	589			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	80	95			
cM capacity (veh/h)	104	484	934			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	96	49	868	638		
Volume Left	1	49	0	0		
Volume Right	94	0	0	8		
cSH	464	934	1700	1700		
Volume to Capacity	0.21	0.05	0.51	0.38		
Queue Length 95th (ft)	19	4	0	0		
Control Delay (s)	14.8	9.1	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	14.8	0.5		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			53.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis University of Rochester, October 2011 Revision
 27: Westmoreland & Kendrick 7/10/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	90	1	40	42	12	76	15	400	15	156	979	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	1	43	46	13	83	16	435	16	170	1064	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						8						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1927	1888	1065	1923	1880	443	1065			451		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1927	1888	1065	1923	1880	443	1065			451		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	98	84	0	78	87	98			85		
cM capacity (veh/h)	31	58	271	36	59	615	654			1109		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	142	141	467	170	1065							
Volume Left	98	46	16	170	0							
Volume Right	43	83	16	0	1							
cSH	43	99	654	1109	1700							
Volume to Capacity	3.29	1.42	0.02	0.15	0.63							
Queue Length 95th (ft)	Err	259	2	13	0							
Control Delay (s)	Err	190.2	0.7	8.8	0.0							
Lane LOS	F	F	A	A								
Approach Delay (s)	Err	190.2	0.7	1.2								
Approach LOS	F	F										
Intersection Summary												
Average Delay			731.4									
Intersection Capacity Utilization			98.5%		ICU Level of Service					F		
Analysis Period (min)			15									

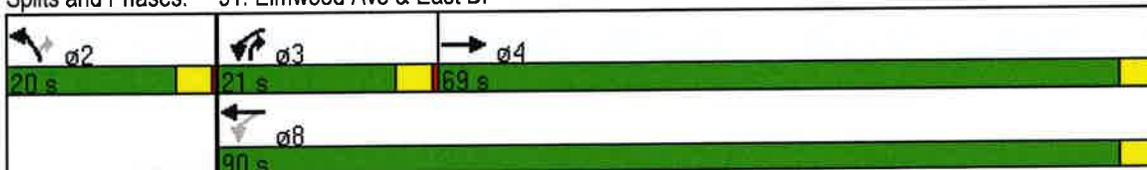


Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↖	↑↑	↖	↗
Volume (vph)	1236	107	864	115	265
Turn Type		pm+pt			pm+ov
Protected Phases	4	3	8	2	3
Permitted Phases		8			2
Detector Phase	4	3	8	2	3
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0	8.0
Total Split (s)	69.0	21.0	90.0	20.0	21.0
Total Split (%)	62.7%	19.1%	81.8%	18.2%	19.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes			Yes
Recall Mode	None	None	C-Max	Min	None
Act Effct Green (s)	75.1	89.2	89.2	12.8	26.9
Actuated g/C Ratio	0.68	0.81	0.81	0.12	0.24
v/c Ratio	0.64	0.38	0.33	0.62	0.69
Control Delay	3.6	5.7	0.2	59.3	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.6	5.7	0.2	59.3	39.4
LOS	A	A	A	E	D
Approach Delay	3.6		0.8	45.4	
Approach LOS	A		A	D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 96 (87%), Referenced to phase 8:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 8.5
 Intersection Capacity Utilization 61.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 91: Elmwood Ave & East Dr





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶		↷		↶	↷
Volume (veh/h)	91	45	796	48	25	527
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	101	50	884	53	28	586
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						393
pX, platoon unblocked	0.84					
vC, conflicting volume	1552	911			938	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1563	911			938	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	85			96	
cM capacity (veh/h)	99	332			731	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	151	938	613
Volume Left	101	0	28
Volume Right	50	53	0
cSH	129	1700	731
Volume to Capacity	1.17	0.55	0.04
Queue Length 95th (ft)	226	0	3
Control Delay (s)	199.5	0.0	1.0
Lane LOS	F		A
Approach Delay (s)	199.5	0.0	1.0
Approach LOS	F		

Intersection Summary			
Average Delay		18.1	
Intersection Capacity Utilization		62.5%	ICU Level of Service B
Analysis Period (min)		15	



Movement	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations			↶	↷	↵	↷
Volume (veh/h)	0	0	48	437	797	277
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	53	486	886	308
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1478	886	1193			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1478	886	1193			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	91			
cM capacity (veh/h)	126	344	585			
Direction, Lane #	NE 1	NE 2	SW 1	SW 2		
Volume Total	53	486	886	308		
Volume Left	53	0	0	0		
Volume Right	0	0	0	308		
cSH	585	1700	1700	1700		
Volume to Capacity	0.09	0.29	0.52	0.18		
Queue Length 95th (ft)	7	0	0	0		
Control Delay (s)	11.8	0.0	0.0	0.0		
Lane LOS	B					
Approach Delay (s)	1.2		0.0			
Approach LOS						
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			45.3%		ICU Level of Service	A
Analysis Period (min)			15			

Timings
162: Elmwood Ave & South

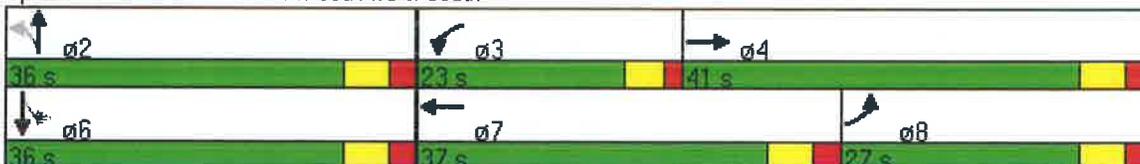
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	193	1160	223	583	6	543	52	442
Turn Type	custom		Prot		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	8				2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	27.0	41.0	23.0	37.0	36.0	36.0	36.0	36.0
Total Split (%)	27.0%	41.0%	23.0%	37.0%	36.0%	36.0%	36.0%	36.0%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?								
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	25.8	39.0	19.0	32.2		33.0		33.0
Actuated g/C Ratio	0.26	0.39	0.19	0.32		0.33		0.33
v/c Ratio	0.47	0.96	0.74	0.60		0.77		0.87
Control Delay	35.8	47.5	52.1	30.7		33.4		43.5
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	35.8	47.5	52.1	30.7		33.4		43.5
LOS	D	D	D	C		C		D
Approach Delay		45.8		36.4		33.4		43.5
Approach LOS		D		D		C		D

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 57 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 40.6
 Intersection Capacity Utilization 98.0%
 Analysis Period (min) 15

Intersection LOS: D
ICU Level of Service F

Splits and Phases: 162: Elmwood Ave & South



Timings
222: WB Ramp to SB & E Henrietta

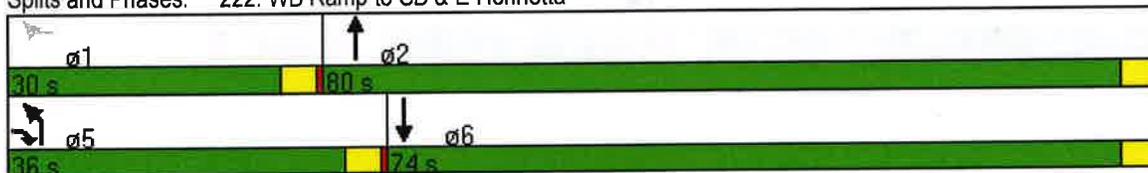


Lane Group	EBR	WBR	NBL	NBT	SBT	SBR2
Lane Configurations	↗	↗↗	↗↗	↑↑	↑↑	↗
Volume (vph)	260	419	535	1031	1489	455
Turn Type	custom	custom	Prot			Free
Protected Phases	5		5	2	6!	
Permitted Phases		1!				Free
Detector Phase	5	1	5	2	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	
Total Split (s)	36.0	30.0	36.0	80.0	74.0	0.0
Total Split (%)	32.7%	27.3%	32.7%	72.7%	67.3%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	C-Max	C-Max	
Act Effect Green (s)	25.3	22.8	25.3	79.2	76.7	110.0
Actuated g/C Ratio	0.23	0.21	0.23	0.72	0.70	1.00
v/c Ratio	0.73	0.81	0.75	0.45	0.67	0.32
Control Delay	45.1	52.9	58.1	6.6	9.6	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.5	0.0
Total Delay	45.1	52.9	58.1	6.6	10.2	0.4
LOS	D	D	E	A	B	A
Approach Delay				24.2	7.9	
Approach LOS				C	A	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 20.8
 Intersection Capacity Utilization 81.1%
 Analysis Period (min) 15
 ! Phase conflict between lane groups.

Splits and Phases: 222: WB Ramp to SB & E Henrietta





Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↓	↖	↑↑	↖	↗
Volume (vph)	1098	34	972	26	39
Turn Type		pm+pt			Perm
Protected Phases	1	3	13	2	
Permitted Phases		13			2
Detector Phase	1	3	13	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	68.0	11.0	79.0	31.0	31.0
Total Split (%)	61.8%	10.0%	71.8%	28.2%	28.2%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effct Green (s)	65.0	73.0	76.0	28.0	28.0
Actuated g/C Ratio	0.59	0.66	0.69	0.25	0.25
v/c Ratio	0.60	0.13	0.44	0.06	0.10
Control Delay	14.8	4.1	4.3	31.7	10.2
Queue Delay	0.0	0.0	0.3	0.0	0.0
Total Delay	14.8	4.1	4.6	31.7	10.2
LOS	B	A	A	C	B
Approach Delay	14.8		4.6	18.8	
Approach LOS	B		A	B	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 10.2
 Intersection Capacity Utilization 43.1%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 393: Elmwood Ave & U of R



Timings
395: Crittenden Blvd & East Dr



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	74	655	360	182	143
Turn Type	Perm				Prot
Protected Phases		1	1	2	2
Permitted Phases	1				
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	15.0	15.0
Total Split (s)	40.0	40.0	40.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	39.2	39.2	39.2	14.8	14.8
Actuated g/C Ratio	0.65	0.65	0.65	0.25	0.25
v/c Ratio	0.15	0.31	0.23	0.46	0.31
Control Delay	5.5	5.3	3.8	22.4	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	5.3	3.8	22.4	5.3
LOS	A	A	A	C	A
Approach Delay		5.3	3.8	14.9	
Approach LOS		A	A	B	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.46
 Intersection Signal Delay: 6.9
 Intersection Capacity Utilization 39.4%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr



Timings
470: MCH & E Henrietta

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	53	1	216	1	9	1315	160	1636
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	14.0	39.0	14.0	39.0
Total Split (s)	28.0	28.0	28.0	28.0	14.0	68.0	14.0	68.0
Total Split (%)	25.5%	25.5%	25.5%	25.5%	12.7%	61.8%	12.7%	61.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	24.0	24.0	24.0	24.0	77.0	66.4	77.0	66.4
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.70	0.60	0.70	0.60
v/c Ratio	0.26	0.19	0.87	0.29	0.04	0.78	0.73	0.88
Control Delay	38.4	9.3	71.1	8.0	2.2	8.8	40.1	25.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.4	0.0	63.1
Total Delay	38.4	9.3	71.1	8.0	2.2	9.1	40.1	88.2
LOS	D	A	E	A	A	A	D	F
Approach Delay		21.9		48.7		9.1		84.0
Approach LOS		C		D		A		F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 49.5
 Intersection Capacity Utilization 79.1%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 470: MCH & E Henrietta



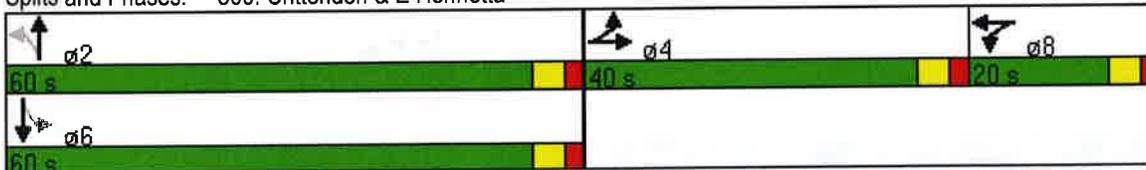


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	881	24	1	82	1228	10	1326
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	40.0	40.0	20.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	16.7%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	37.0	37.0	8.7	69.7	69.7	69.7	69.7
Actuated g/C Ratio	0.31	0.31	0.07	0.58	0.58	0.58	0.58
v/c Ratio	1.17	1.12	0.13	1.42	0.66	0.10	0.98
Control Delay	134.1	113.8	29.9	284.7	20.1	16.4	40.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	15.4
Total Delay	134.1	113.8	29.9	284.7	20.1	16.4	55.5
LOS	F	F	C	F	C	B	E
Approach Delay		124.2	29.9		36.7		55.3
Approach LOS		F	C		D		E

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 105 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.42
 Intersection Signal Delay: 66.9
 Intersection Capacity Utilization 101.6%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service G

Splits and Phases: 500: Crittenden & E Henrietta



Timings
501: Southland Drive & West Henrietta Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕	↖	↗	↖	↗
Volume (vph)	9	1	25	1	6	1634	24	1326
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	75.0	75.0	13.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	68.2%	68.2%	11.8%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.7		10.7	86.7	86.7	93.3	93.3
Actuated g/C Ratio		0.10		0.10	0.79	0.79	0.85	0.85
v/c Ratio		0.23		0.59	0.03	0.66	0.11	0.50
Control Delay		27.6		21.3	4.7	8.6	3.3	5.8
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.3
Total Delay		27.6		21.3	4.7	8.6	3.3	6.2
LOS		C		C	A	A	A	A
Approach Delay		27.6		21.3		8.6		6.1
Approach LOS		C		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 62 (56%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 8.3
 Intersection Capacity Utilization 62.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 501: Southland Drive & West Henrietta Road



Timings
502: Doncaster Road & West Henrietta Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕↕		↕↕
Volume (vph)	3	1	14	1	6	1638	12	1342
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)		7.0		7.0		101.6		101.6
Actuated g/C Ratio		0.06		0.06		0.92		0.92
v/c Ratio		0.07		0.30		0.59		0.50
Control Delay		39.5		38.9		4.6		1.6
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		39.5		38.9		4.6		1.6
LOS		D		D		A		A
Approach Delay		39.5		38.9		4.6		1.6
Approach LOS		D		D		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 71 (65%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 3.7
 Intersection Capacity Utilization 59.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 502: Doncaster Road & West Henrietta Road



Timings
503: Crittenden & West Henrietta Road

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	23	64	258	169	88	1389	198	1335
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	9.0	25.0	8.0	25.0
Total Split (s)	32.0	32.0	32.0	32.0	13.0	65.0	13.0	65.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	11.8%	59.1%	11.8%	59.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	0.0	1.0	0.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	0.0	-2.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)		29.0		29.0	69.8	62.0	73.9	64.2
Actuated g/C Ratio		0.26		0.26	0.63	0.56	0.67	0.58
v/c Ratio		0.21		0.97	0.50	0.91	0.96	0.78
Control Delay		22.6		63.2	15.0	40.5	69.6	26.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		22.6		63.2	15.0	40.5	69.6	26.1
LOS		C		E	B	D	E	C
Approach Delay		22.6		63.2		39.2		31.3
Approach LOS		C		E		D		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 39.4
 Intersection Capacity Utilization 89.3%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 503: Crittenden & West Henrietta Road



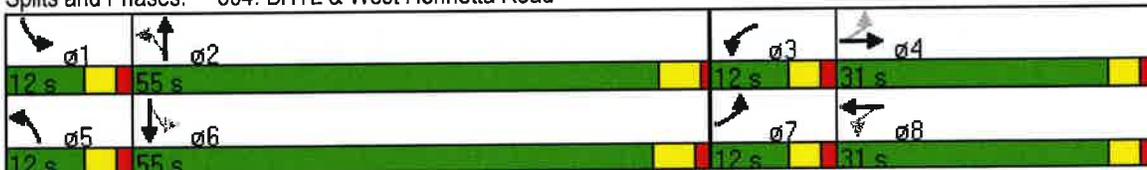


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	170	272	326	315	39	1351	140	1412
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	12.0	31.0	12.0	31.0	12.0	55.0	12.0	55.0
Total Split (%)	10.9%	28.2%	10.9%	28.2%	10.9%	50.0%	10.9%	50.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	31.6	22.6	31.6	22.6	64.0	55.9	68.7	62.5
Actuated g/C Ratio	0.29	0.21	0.29	0.21	0.58	0.51	0.62	0.57
v/c Ratio	0.88	0.51	1.30	0.72	0.22	0.97	0.66	0.89
Control Delay	68.3	38.1	187.7	38.4	11.7	42.2	28.1	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	38.1	187.7	38.4	11.7	42.2	28.1	26.7
LOS	E	D	F	D	B	D	C	C
Approach Delay		48.3		97.6		41.5		26.8
Approach LOS		D		F		D		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 49 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.30
 Intersection Signal Delay: 46.7
 Intersection Capacity Utilization 92.1%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 504: BHTL & West Henrietta Road





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	102	11	204	34	12	312
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	113	12	227	38	13	347
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	619	246			264	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	619	246			264	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	98			99	
cM capacity (veh/h)	447	793			1300	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	126	264	360
Volume Left	113	0	13
Volume Right	12	38	0
cSH	467	1700	1300
Volume to Capacity	0.27	0.16	0.01
Queue Length 95th (ft)	27	0	1
Control Delay (s)	15.5	0.0	0.4
Lane LOS	C		A
Approach Delay (s)	15.5	0.0	0.4
Approach LOS	C		

Intersection Summary			
Average Delay		2.8	
Intersection Capacity Utilization		39.1%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	↑
Volume (veh/h)	777	54	64	553	222	103
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	863	60	71	614	247	114
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	615		1317			
pX, platoon unblocked						
vC, conflicting volume			923		1343	462
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			923		1343	462
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		0	79
cM capacity (veh/h)			736		129	547

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	576	348	276	410	247	114
Volume Left	0	0	71	0	247	0
Volume Right	0	60	0	0	0	114
cSH	1700	1700	736	1700	129	547
Volume to Capacity	0.34	0.20	0.10	0.24	1.91	0.21
Queue Length 95th (ft)	0	0	8	0	486	20
Control Delay (s)	0.0	0.0	3.5	0.0	492.5	13.3
Lane LOS			A		F	B
Approach Delay (s)	0.0		1.4		340.7	
Approach LOS					F	

Intersection Summary						
Average Delay			62.9			
Intersection Capacity Utilization			62.6%	ICU Level of Service		B
Analysis Period (min)			15			

Intersection								
Intersection Delay (sec/veh)	8.5							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		1		2	
Conflicting Circle Lanes	2		2		2		2	
Adjusted Approach Flow (vph)	277		585		104		886	
Demand Flow Rate (pc/h)	282		597		105		904	
Vehicles Circulating (pc/h)	733		142		885		174	
Vehicles Exiting (pc/h)	345		848		130		126	
Follow-Up Headway (s)	3.186		3.186		3.186		3.186	
Ped Vol. Crossing Leg (#/hr)	0		0		0		0	
Ped Capacity Adjustment	1.000		1.000		1.000		1.000	
Approach Delay (sec/veh)	8.1		1.3		8.1		13.4	
Approach LOS	A		A		A		B	
Lane	Left	Right	Left	Bypass	Left	Left	Right	
Designated moves	LT	TR	LT	R	LTR	LT	R	
Assumed Moves	LT	TR	LT	R	LTR	LT	R	
Right Turn Channelized	Free							
Lane Utilization	0.472	0.528	1.000		1.000	0.775	0.225	
Critical Headway (s)	4.293	4.113	4.293		4.113	4.293	4.113	
Entry Flow Rate (pc/h)	133	149	158	439	105	701	203	
Capacity, Entry Lane (pc/h)	652	676	1016	1938	608	992	1000	
Entry HV Adjustment Factor	0.978	0.985	0.978	0.980	0.987	0.981	0.980	
Flow Rate, Entry (vph)	130	147	155	430	104	687	199	
Capacity, Entry (vph)	638	666	993	1900	600	972	981	
Volume to Capacity Ratio	0.204	0.220	0.156	0.226	0.173	0.707	0.203	
Control Delay (sec/veh)	8.1	8.0	5.1	0.0	8.1	15.6	5.6	
Level of Service	A	A	A	A	A	C	A	
95th-Percentile Queue (veh)	1	1	1	1	1	6	1	

AM Peak Hour

Build Conditions with Mitigation 5-Year

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HCM Unsignalized Intersection Capacity Analysis
 1: East River Road & Kendrick

7/11/2013
 University of Rochester < October 2011 Revision



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	182	144	33	34	228	995	9	37	41	208	12	75
Peak Hour Factor	0.90	0.90	0.92	0.92	0.90	0.90	0.92	0.92	0.92	0.90	0.92	0.90
Hourly flow rate (vph)	202	160	36	37	253	1106	10	40	45	231	13	83
Approach Volume (veh/h)		398			1396			95			327	
Crossing Volume (veh/h)		281			252			593			300	
High Capacity (veh/h)		1111			1136			866			1094	
High v/c (veh/h)		0.36			1.23			0.11			0.30	
Low Capacity (veh/h)		913			936			695			898	
Low v/c (veh/h)		0.44			1.49			0.14			0.36	
Intersection Summary												
Maximum v/c High					1.23							
Maximum v/c Low					1.49							
Intersection Capacity Utilization			78.0%		ICU Level of Service						D	

Timings
2: East River Road & I-390 S On Ramp



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations		↕↕	↕↕	↕↕	↕
Volume (vph)	130	233	750	1113	445
Turn Type	Perm				Free
Protected Phases		4	8	6	
Permitted Phases	4				Free
Detector Phase	4	4	8	6	
Switch Phase					
Minimum Initial (s)	3.0	3.0	3.0	3.0	
Minimum Split (s)	25.0	25.0	25.0	25.0	
Total Split (s)	36.0	36.0	36.0	54.0	0.0
Total Split (%)	40.0%	40.0%	40.0%	60.0%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	3.0	3.0	3.0	2.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	
Act Effct Green (s)		26.7	26.7	35.1	68.1
Actuated g/C Ratio		0.39	0.39	0.52	1.00
v/c Ratio		1.28dl	0.70	0.70	0.31
Control Delay		20.4	21.3	15.3	0.5
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		20.4	21.3	15.3	0.5
LOS		C	C	B	A
Approach Delay		20.4	21.3	11.1	
Approach LOS		C	C	B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 68.1
 Natural Cycle: 50
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 15.5
 Intersection Capacity Utilization 76.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: East River Road & I-390 S On Ramp



Timings
3: College Town & Mt. Hope

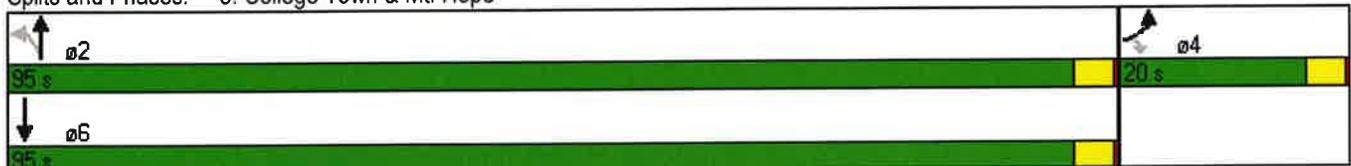


Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	15	41	18	1008	1254
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	95.0	95.0	95.0
Total Split (%)	17.4%	17.4%	82.6%	82.6%	82.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	6.8	6.8	102.9	102.9	102.9
Actuated g/C Ratio	0.06	0.06	0.89	0.89	0.89
v/c Ratio	0.15	0.33	0.06	0.35	0.43
Control Delay	53.9	21.6	0.8	0.8	0.7
Queue Delay	0.0	0.0	0.0	0.1	0.2
Total Delay	53.9	21.6	0.8	0.9	1.0
LOS	D	C	A	A	A
Approach Delay	30.0			0.9	1.0
Approach LOS	C			A	A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.43
 Intersection Signal Delay: 1.6
 Intersection Capacity Utilization 44.9%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: College Town & Mt. Hope



HCM Unsignalized Intersection Capacity Analysis
 5: West Henrietta Road &

7/11/2013
 University of Rochester < October 2011 Revision



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↑↑↑	↑↑	↗
Volume (veh/h)	0	0	0	1631	796	174
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	1773	865	189
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				267	774	
pX, platoon unblocked	0.90	0.88	0.88			
vC, conflicting volume	1456	433	1054			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	387	69	779			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	529	858	730			
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	591	591	591	433	433	189
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	189
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.35	0.35	0.35	0.25	0.25	0.11
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	34.8%			ICU Level of Service		A
Analysis Period (min)	15					

Timings

7/11/2013

6: East River Road & West Henrietta Road

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Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Configurations									
Volume (vph)	464	62	716	101	696	144	946	65	687
Turn Type	Split		Perm	Split		pm+pt		Perm	
Protected Phases	4	4		8	8	5	2		6
Permitted Phases			4			2		2	
Detector Phase	4	4	4	8	8	5	2	2	6
Switch Phase									
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0	3.0
Minimum Split (s)	15.0	15.0	15.0	15.0	15.0	8.0	29.0	29.0	25.5
Total Split (s)	36.0	36.0	36.0	35.0	35.0	10.0	44.0	44.0	34.0
Total Split (%)	31.3%	31.3%	31.3%	30.4%	30.4%	8.7%	38.3%	38.3%	29.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	0.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	2.0	3.0	4.0	3.0
Lead/Lag						Lead			Lag
Lead-Lag Optimize?						Yes			
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	30.8	30.8	30.8	34.2	34.2	42.0	41.0	40.0	31.0
Actuated g/C Ratio	0.27	0.27	0.27	0.30	0.30	0.37	0.36	0.35	0.27
v/c Ratio	0.79	0.62	0.59	0.21	0.98	0.84	0.58	0.12	0.94
Control Delay	53.0	17.7	7.1	32.8	63.2	63.0	31.6	6.4	47.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.0	17.7	7.1	32.8	63.2	63.0	31.6	6.4	47.1
LOS	D	B	A	C	E	E	C	A	D
Approach Delay		23.4			60.2		34.1		47.1
Approach LOS		C			E		C		D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 39.7
 Intersection Capacity Utilization 88.4%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 6: East River Road & West Henrietta Road

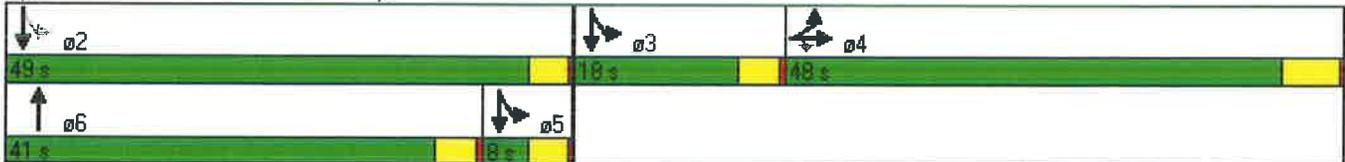
Timings
8: I-390 SB Ramp & E Henrietta

									ø2	ø3	ø5
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT				
Lane Configurations											
Volume (vph)	493	83	892	902	220	283	1471				
Turn Type	Split		Perm		Free	pm+pt					
Protected Phases	4	4		6		3 5	2 3 5	2	3	5	
Permitted Phases			4		Free	2 3 5					
Detector Phase	4	4	4	6		3 5	2 3 5				
Switch Phase											
Minimum Initial (s)	3.0	3.0	3.0	4.0				4.0	4.0	3.0	
Minimum Split (s)	25.5	25.5	25.5	20.0				20.0	20.0	8.0	
Total Split (s)	48.0	48.0	48.0	41.0	0.0	26.0	75.0	49.0	18.0	8.0	
Total Split (%)	41.7%	41.7%	41.7%	35.7%	0.0%	22.6%	65.2%	43%	16%	7%	
Yellow Time (s)	5.0	5.0	5.0	3.5				3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5				0.5	0.5	0.5	
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-1.0	-1.0	-1.0	-1.0				
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Lead/Lag	Lag	Lag	Lag	Lead					Lead	Lag	
Lead-Lag Optimize?											
Recall Mode	None	None	None	C-Max				C-Max	None	Min	
Act Effect Green (s)	43.5	43.5	43.5	39.6	115.0	65.5	65.5				
Actuated g/C Ratio	0.38	0.38	0.38	0.34	1.00	0.57	0.57				
v/c Ratio	0.66	0.89dr	0.89	0.82	0.15	0.39	0.81				
Control Delay	35.0	32.0	51.0	41.7	0.2	24.7	17.9				
Queue Delay	0.0	0.0	0.0	1.1	0.0	0.0	0.0				
Total Delay	35.0	32.0	51.0	42.8	0.2	24.7	17.9				
LOS	C	C	D	D	A	C	B				
Approach Delay		38.5		34.5			19.0				
Approach LOS		D		C			B				

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 29.6
 Intersection LOS: C
 Intersection Capacity Utilization 84.2%
 ICU Level of Service E
 Analysis Period (min) 15
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: I-390 SB Ramp & E Henrietta



Timings
10: Westfall & E Henrietta



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	89	325	222	305	236	1100	465	201	943
Turn Type	pm+pt		Prot		pm+pt		custom	pm+pt	
Protected Phases	5	2	1	6	7	4		3	8
Permitted Phases	2				4		2	8	
Detector Phase	5	2	1	6	7	4	2	3	8
Switch Phase									
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	10.0	7.0	5.0	7.0
Minimum Split (s)	10.0	32.0	10.0	32.0	10.0	32.0	32.0	10.0	32.0
Total Split (s)	14.0	35.0	14.0	35.0	19.0	47.0	35.0	19.0	47.0
Total Split (%)	12.2%	30.4%	12.2%	30.4%	16.5%	40.9%	30.4%	16.5%	40.9%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0	-2.0	-1.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	C-Max	None	Max
Act Effct Green (s)	43.0	32.4	10.6	32.4	60.0	45.3	31.4	60.0	45.3
Actuated g/C Ratio	0.37	0.28	0.09	0.28	0.52	0.39	0.27	0.52	0.39
v/c Ratio	0.34	0.46	0.78	0.55	0.89	0.88	0.73	0.76	0.85
Control Delay	18.6	25.4	68.5	28.4	57.0	47.2	13.0	33.3	39.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	10.2	1.2	0.0	0.1
Total Delay	18.6	25.4	68.5	28.4	57.0	57.4	14.1	33.3	39.7
LOS	B	C	E	C	E	E	B	C	D
Approach Delay		24.2		40.5		46.2			38.7
Approach LOS		C		D		D			D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 44 (38%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 40.5
 Intersection Capacity Utilization 75.9%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 10: Westfall & E Henrietta

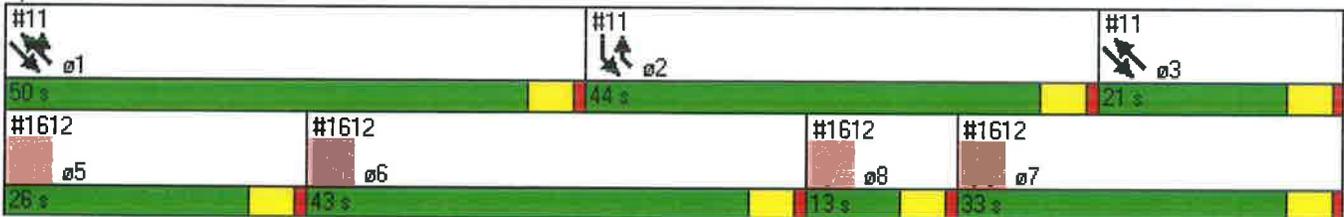
Timings
11: South & E Henrietta

Lane Group	SBL	SET	NWT	NWR	ø1	ø3	ø5	ø6	ø7	ø8
Lane Configurations										
Volume (vph)	605	486	551	714						
Turn Type				custom						
Protected Phases	2	13	13	12	1	3	5	6	7	8
Permitted Phases		13		1						
Detector Phase	2	13	13	12						
Switch Phase										
Minimum Initial (s)	10.0				24.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	21.0	33.0	33.0	13.0
Total Split (s)	44.0	71.0	71.0	94.0	50.0	21.0	26.0	43.0	33.0	13.0
Total Split (%)	38.3%	61.7%	61.7%	81.7%	43%	18%	23%	37%	29%	11%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0						
Total Lost Time (s)	3.0	3.0	3.0	3.0						
Lead/Lag	Lag				Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None				C-Max	None	C-Max	None	None	None
Act Effct Green (s)	34.0	75.0	75.0	87.7						
Actuated g/C Ratio	0.30	0.65	0.65	0.76						
v/c Ratio	0.66	0.25	0.50	0.57						
Control Delay	50.2	6.0	5.4	4.2						
Queue Delay	1.5	0.0	0.0	0.5						
Total Delay	51.7	6.0	5.4	4.7						
LOS	D	A	A	A						
Approach Delay	51.7	6.0	5.0							
Approach LOS	D	A	A							

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NWSE and 5:, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 17.2
 Intersection Capacity Utilization 52.9%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 11: South & E Henrietta



Timings

7/11/2013

12: Crittenden Blvd & Mt. Hope

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Lane Group	EBL	EBR	EBR2	NBL	NBT	SBL	SBT	NWL	NWR	ø4	ø7
Lane Configurations											
Volume (vph)	98	179	136	190	520	346	812	194	380		
Turn Type		Prot	Perm	pm+pt		pm+pt			pt+ov		
Protected Phases	8	8		5	2	1	6	3	3 1	4	7
Permitted Phases			8	2		6					
Detector Phase	8	8	8	5	2	1	6	3	3 1		
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	5.0	7.0	5.0	7.0	6.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	12.0	27.0	12.0	27.0	18.0		8.0	8.0
Total Split (s)	21.0	21.0	21.0	16.0	45.0	17.0	46.0	24.0	41.0	29.0	8.0
Total Split (%)	18.3%	18.3%	18.3%	13.9%	39.1%	14.8%	40.0%	20.9%	35.7%	25%	7%
Yellow Time (s)	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.0		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	2.0	2.0	2.0	2.0	2.0		0.5	0.5
Lost Time Adjust (s)	-3.0	-3.0	-1.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	1.0	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes								Yes
Recall Mode	None	None	None	None	C-Max	None	C-Max	None		None	None
Act Effct Green (s)	22.5	22.5	20.5	59.7	44.9	64.7	48.1	19.6	37.6		
Actuated g/C Ratio	0.20	0.20	0.18	0.52	0.39	0.56	0.42	0.17	0.33		
v/c Ratio	0.31	0.64	0.54	0.70	0.43	0.76	0.78	0.72	0.59		
Control Delay	43.2	53.5	50.3	33.5	39.3	34.2	40.3	53.2	10.5		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0		
Total Delay	43.2	53.5	50.3	33.5	39.3	34.2	40.4	53.2	10.5		
LOS	D	D	D	C	D	C	D	D	B		
Approach Delay	50.0				37.8		38.9	24.9			
Approach LOS	D				D		D	C			

Intersection Summary

Cycle Length: 115

Actuated Cycle Length: 115

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 37.5

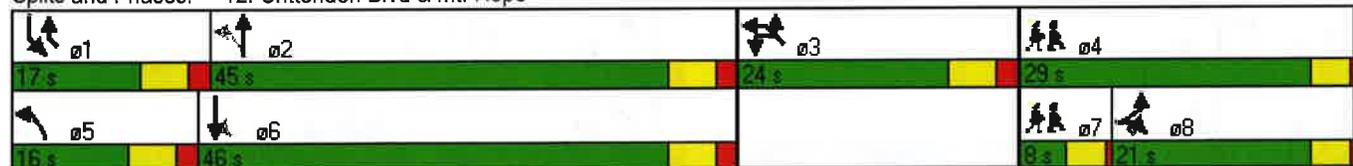
Intersection LOS: D

Intersection Capacity Utilization 68.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 12: Crittenden Blvd & Mt. Hope



Timings
13: Elmwood Ave & Mt. Hope

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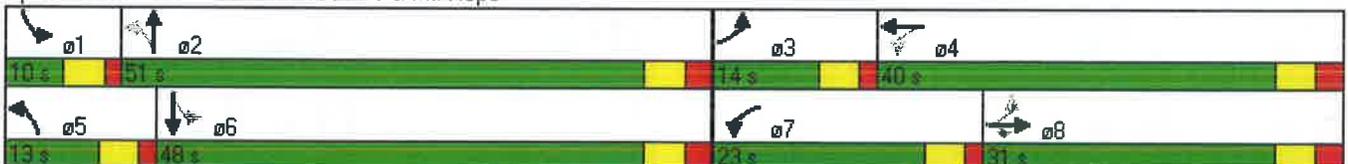
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	202	590	176	332	909	181	708	38	751
Turn Type	pm+pt		Perm	pm+pt		pm+pt		pm+pt	
Protected Phases	3	8		7	4	5	2	1	6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	7	4	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	4.0	7.0	4.0	7.0
Minimum Split (s)	12.0	31.0	31.0	12.0	31.0	10.0	33.0	10.0	33.0
Total Split (s)	14.0	31.0	31.0	23.0	40.0	13.0	51.0	10.0	48.0
Total Split (%)	12.2%	27.0%	27.0%	20.0%	34.8%	11.3%	44.3%	8.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-1.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	39.0	28.0	26.0	51.0	37.0	58.0	50.0	51.9	45.0
Actuated g/C Ratio	0.34	0.24	0.23	0.44	0.32	0.50	0.43	0.45	0.39
v/c Ratio	0.95	0.76	0.41	0.98	0.90	0.91	0.62	0.18	0.92
Control Delay	75.2	31.5	10.4	73.5	23.1	77.1	19.7	16.4	42.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	75.2	31.5	10.4	73.5	23.1	77.1	19.9	16.4	42.3
LOS	E	C	B	E	C	E	B	B	D
Approach Delay		36.7			36.4		30.0		41.5
Approach LOS		D			D		C		D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 113 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 36.3
 Intersection Capacity Utilization 93.0%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 13: Elmwood Ave & Mt. Hope



Timings
14: Lattimore & Mt. Hope



Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	9	124	731	856
Turn Type	Perm			
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	26.0	24.0	24.0	24.0
Total Split (s)	27.0	88.0	88.0	88.0
Total Split (%)	23.5%	76.5%	76.5%	76.5%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	C-Max	C-Max	C-Max
Act Effect Green (s)	9.0		100.0	100.0
Actuated g/C Ratio	0.08		0.87	0.87
v/c Ratio	0.25		0.48	0.34
Control Delay	26.3		4.8	0.5
Queue Delay	0.0		0.0	0.0
Total Delay	26.3		4.8	0.5
LOS	C		A	A
Approach Delay	26.3		4.8	0.5
Approach LOS	C		A	A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.48
 Intersection Signal Delay: 3.0
 Intersection Capacity Utilization 64.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 14: Lattimore & Mt. Hope



Timings
15: Westfall & Mt. Hope

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Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑	↑	↑	↑	↑↑	↑	↑	↑↑
Volume (vph)	9	132	66	191	239	106	768	432	109	714
Turn Type	Perm		custom	pm+pt		pm+pt		Perm	pm+pt	
Protected Phases		4	4	3	3 4	2	1		2	1
Permitted Phases	4		4	3 4		1		1	1	
Detector Phase	4	4	4	3	3 4	2	1	1	2	1
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	5.0		5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	29.0	29.0	29.0	11.0		13.0	40.0	40.0	13.0	40.0
Total Split (s)	29.0	29.0	29.0	14.0	43.0	32.0	40.0	40.0	32.0	40.0
Total Split (%)	25.2%	25.2%	25.2%	12.2%	37.4%	27.8%	34.8%	34.8%	27.8%	34.8%
Yellow Time (s)	4.0	4.0	4.0	3.0		3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	1.0	2.0		2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	None	None	None		None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		18.5	18.5	40.4	43.4	62.6	52.6	51.6	62.6	52.6
Actuated g/C Ratio		0.16	0.16	0.35	0.38	0.54	0.46	0.45	0.54	0.46
v/c Ratio		0.54	0.24	0.45	0.54	0.33	0.53	0.49	0.35	0.49
Control Delay		50.4	16.1	28.9	30.2	16.4	17.9	2.0	36.5	28.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		50.4	16.1	28.9	30.2	16.4	17.9	2.0	36.5	28.2
LOS		D	B	C	C	B	B	A	D	C
Approach Delay		39.5			29.7		12.5			29.3
Approach LOS		D			C		B			C

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 22.5
 Intersection Capacity Utilization 66.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 15: Westfall & Mt. Hope

Timings
18: Iona & E Henrietta

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↖	↑↑	↗	↘	↑↑
Volume (vph)	114	30	1839	217	106	1088
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	21.5	21.5	9.0	21.5
Total Split (s)	22.0	22.0	81.0	81.0	12.0	93.0
Total Split (%)	19.1%	19.1%	70.4%	70.4%	10.4%	80.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.0	2.0	1.5	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	12.8	12.8	78.4	78.4	91.2	90.7
Actuated g/C Ratio	0.11	0.11	0.68	0.68	0.79	0.79
v/c Ratio	0.63	0.16	0.83	0.21	0.65	0.42
Control Delay	62.6	16.3	9.5	0.4	50.4	2.1
Queue Delay	0.0	0.0	2.1	0.4	0.0	0.0
Total Delay	62.6	16.3	11.5	0.8	50.4	2.1
LOS	E	B	B	A	D	A
Approach Delay	52.9		10.4			6.4
Approach LOS	D		B			A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 10.8
 Intersection Capacity Utilization 76.8%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 18: Iona & E Henrietta

Timings

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21: Crittenden Blvd & Kendrick

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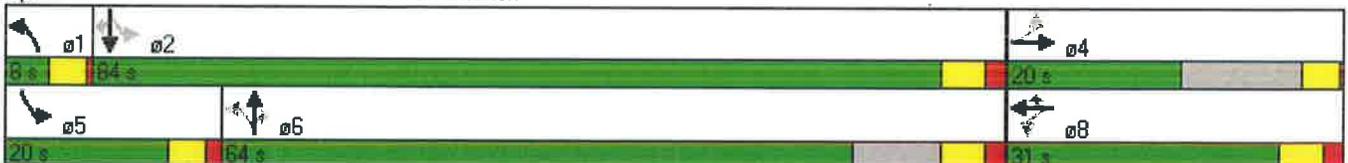
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	49	35	59	190	142	85	216	72	167	563	462
Turn Type	Perm		Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases		4		8		1	6		5	2	
Permitted Phases	4		8		8	6		6	2		2
Detector Phase	4	4	8	8	8	1	6	6	5	2	2
Switch Phase											
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	4.0	10.0	10.0	6.0	10.0	10.0
Minimum Split (s)	20.0	20.0	31.0	31.0	31.0	8.0	32.0	32.0	20.0	32.0	32.0
Total Split (s)	20.0	20.0	31.0	31.0	31.0	8.0	64.0	64.0	20.0	84.0	84.0
Total Split (%)	16.3%	16.3%	25.2%	25.2%	25.2%	6.5%	52.0%	52.0%	16.3%	68.3%	68.3%
Yellow Time (s)	3.5	3.5	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	0.5	0.5	2.0	2.0	2.0	0.5	2.0	2.0	1.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0	-1.0	-2.0	-3.0	-3.0	-2.0	-3.0	-3.0
Total Lost Time (s)	1.0	1.0	3.0	3.0	5.0	2.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes					
Recall Mode	None	None	Min	Min	Min	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	28.8	28.8		26.8	24.8	83.8	76.2	76.2	89.8	81.7	81.7
Actuated g/C Ratio	0.23	0.23		0.22	0.20	0.68	0.62	0.62	0.73	0.66	0.66
v/c Ratio	0.45	0.13		0.80	0.37	0.20	0.22	0.08	0.24	0.54	0.52
Control Delay	53.6	30.2		63.5	8.8	6.0	11.5	2.5	6.0	13.2	13.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	2.2	1.4
Total Delay	53.6	30.2		63.5	8.8	6.0	11.5	2.5	6.0	15.3	14.6
LOS	D	C		E	A	A	B	A	A	B	B
Approach Delay		42.2		43.6			8.5			13.7	
Approach LOS		D		D			A			B	

Intersection Summary

Cycle Length: 123
 Actuated Cycle Length: 123
 Offset: 95 (77%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 19.8
 Intersection Capacity Utilization 64.3%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings

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22: ELMWOOD AVENUE & Kendrick

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Lane Group	EBT	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↑↑	↑↑
Volume (vph)	634	540	433	231
Turn Type		pm+pt		
Protected Phases	1	3	1 3	2
Permitted Phases		1 3		
Detector Phase	1	3	1 3	2
Switch Phase				
Minimum Initial (s)	15.0	4.0		10.0
Minimum Split (s)	34.0	10.0		26.0
Total Split (s)	46.0	42.0	88.0	27.0
Total Split (%)	40.0%	36.5%	76.5%	23.5%
Yellow Time (s)	4.0	3.5		4.0
All-Red Time (s)	1.0	1.5		1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lead			Lag
Lead-Lag Optimize?				
Recall Mode	C-Max	None		None
Act Effct Green (s)	47.6	86.1	89.1	19.9
Actuated g/C Ratio	0.41	0.75	0.77	0.17
v/c Ratio	0.94	0.91	0.18	0.68
Control Delay	40.6	50.5	3.6	32.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	40.6	50.5	3.6	32.5
LOS	D	D	A	C
Approach Delay	40.6		29.6	32.5
Approach LOS	D		C	C

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 35.3
 Intersection Capacity Utilization 91.0%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 22: ELMWOOD AVENUE & Kendrick

HCM Unsignalized Intersection Capacity Analysis
 25: Lattimore & Kendrick

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	37	21	450	153	140	484
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	41	23	500	170	156	538
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						795
pX, platoon unblocked	0.89					
vC, conflicting volume	1434	585			670	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1426	585			670	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	63	95			83	
cM capacity (veh/h)	111	511			920	
Direction, Lane #						
	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	41	23	670	156	538	
Volume Left	41	0	0	156	0	
Volume Right	0	23	170	0	0	
cSH	111	511	1700	920	1700	
Volume to Capacity	0.37	0.05	0.39	0.17	0.32	
Queue Length 95th (ft)	38	4	0	15	0	
Control Delay (s)	55.6	12.4	0.0	9.7	0.0	
Lane LOS	F	B		A		
Approach Delay (s)	39.9		0.0	2.2		
Approach LOS	E					
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization			54.1%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Lot #1 & Kendrick

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	54	87	844	484	37
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	60	97	938	538	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					957	
pX, platoon unblocked	0.91	0.91	0.91			
vC, conflicting volume	1689	558	579			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1708	467	489			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	89	90			
cM capacity (veh/h)	82	543	979			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	61	97	938	579
Volume Left	1	97	0	0
Volume Right	60	0	0	41
cSH	493	979	1700	1700
Volume to Capacity	0.12	0.10	0.55	0.34
Queue Length 95th (ft)	11	8	0	0
Control Delay (s)	13.3	9.1	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.3	0.8		0.0
Approach LOS	B			

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		54.5%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 27: Westmoreland & Kendrick

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Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	1	10	29	19	23	139	261	796	40	95	285	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	11	32	21	25	151	284	865	43	103	310	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						8						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2059	1993	310	2008	1972	887	311			909		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2059	1993	310	2008	1972	887	311			909		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	73	96	18	40	56	77			86		
cM capacity (veh/h)	9	40	730	25	42	343	1250			749		
Direction, Lane #	SE 1	NW 1	NE 1	SW 1	SW 2							
Volume Total	43	197	1192	103	311							
Volume Left	1	21	284	103	0							
Volume Right	32	151	43	0	1							
cSH	100	147	1250	749	1700							
Volume to Capacity	0.43	1.34	0.23	0.14	0.18							
Queue Length 95th (ft)	46	306	22	12	0							
Control Delay (s)	65.7	122.5	5.3	10.6	0.0							
Lane LOS	F	F	A	B								
Approach Delay (s)	65.7	122.5	5.3	2.6								
Approach LOS	F	F										
Intersection Summary												
Average Delay			18.6									
Intersection Capacity Utilization			92.7%			ICU Level of Service			F			
Analysis Period (min)			15									

Timings
91: Elmwood Ave &

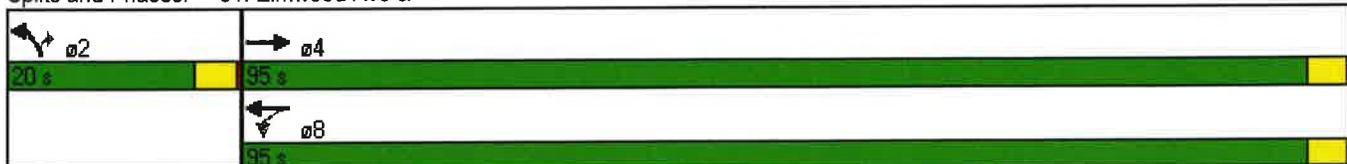
	→	↖	←	↙	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑
Volume (vph)	756	243	1177	91	164
Turn Type		Perm			Perm
Protected Phases	4		8	2	
Permitted Phases		8			2
Detector Phase	4	8	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	95.0	95.0	95.0	20.0	20.0
Total Split (%)	82.6%	82.6%	82.6%	17.4%	17.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	C-Max	C-Max	Min	Min
Act Effect Green (s)	95.2	95.2	95.2	11.8	11.8
Actuated g/C Ratio	0.83	0.83	0.83	0.10	0.10
v/c Ratio	0.32	0.58	0.45	0.56	0.56
Control Delay	1.7	6.5	2.2	60.2	13.7
Queue Delay	0.6	0.0	0.0	0.0	0.0
Total Delay	2.4	6.5	2.2	60.2	13.7
LOS	A	A	A	E	B
Approach Delay	2.4		2.9	30.3	
Approach LOS	A		A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 50 (43%), Referenced to phase 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.5
 Intersection Capacity Utilization 51.7%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 91: Elmwood Ave &



HCM Unsignalized Intersection Capacity Analysis
100: CTSB & Kendrick

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	40	20	358	92	50	584
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	22	389	100	54	635
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						414
pX, platoon unblocked	0.81					
vC, conflicting volume	1183	439			489	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1107	439			489	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	96			95	
cM capacity (veh/h)	178	618			1074	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	65	489	689			
Volume Left	43	0	54			
Volume Right	22	100	0			
cSH	234	1700	1074			
Volume to Capacity	0.28	0.29	0.05			
Queue Length 95th (ft)	28	0	4			
Control Delay (s)	26.3	0.0	1.3			
Lane LOS	D		A			
Approach Delay (s)	26.3	0.0	1.3			
Approach LOS	D					
Intersection Summary						
Average Delay			2.1			
Intersection Capacity Utilization			71.4%	ICU Level of Service		C
Analysis Period (min)			15			

Timings

7/11/2013

162: ELMWOOD AVENUE & South

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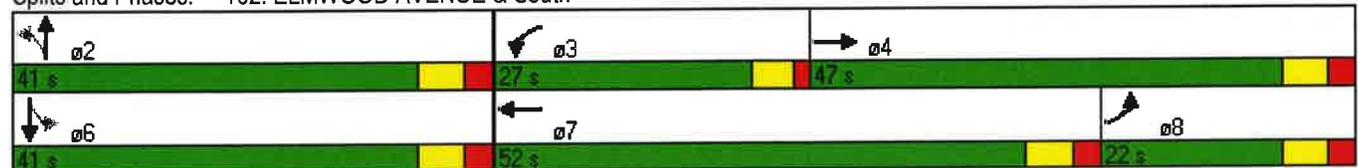


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	187	508	197	1158	4	525	48	400
Turn Type	custom		Prot		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	8				2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	22.0	47.0	27.0	52.0	41.0	41.0	41.0	41.0
Total Split (%)	19.1%	40.9%	23.5%	45.2%	35.7%	35.7%	35.7%	35.7%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?								
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	19.0	46.9	21.1	49.0		38.0		38.0
Actuated g/C Ratio	0.17	0.41	0.18	0.43		0.33		0.33
v/c Ratio	0.71	0.41	0.68	0.89		0.66		0.82
Control Delay	30.4	9.8	54.3	39.0		21.5		42.1
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	30.4	9.8	54.3	39.0		21.5		42.1
LOS	C	A	D	D		C		D
Approach Delay		15.2		41.2		21.5		42.1
Approach LOS		B		D		C		D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 32.0
 Intersection LOS: C
 Intersection Capacity Utilization 93.9%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 162: ELMWOOD AVENUE & South





Lane Group	EBR	WBR	NBL	NBT	SBT	SBR2
Lane Configurations						
Volume (vph)	579	875	214	1181	1175	78
Turn Type	custom	custom	Prot			Free
Protected Phases			5	2	6!	
Permitted Phases	5	1!				Free
Detector Phase	5	1	5	2	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	
Total Split (s)	56.0	56.0	56.0	59.0	59.0	0.0
Total Split (%)	48.7%	48.7%	48.7%	51.3%	51.3%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	C-Max	C-Max	
Act Effct Green (s)	47.9	45.8	47.9	61.2	59.1	115.0
Actuated g/C Ratio	0.42	0.40	0.42	0.53	0.51	1.00
v/c Ratio	0.92	0.86	0.16	0.68	0.70	0.05
Control Delay	49.0	39.9	23.4	8.3	20.1	0.1
Queue Delay	0.0	0.0	0.0	0.3	0.4	0.0
Total Delay	49.0	39.9	23.4	8.5	20.6	0.1
LOS	D	D	C	A	C	A
Approach Delay				10.8	19.3	
Approach LOS				B	B	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 25.0
 Intersection Capacity Utilization 79.2%
 Analysis Period (min) 15
 ! Phase conflict between lane groups.

Splits and Phases: 222: I-390 NB &

Timings

7/11/2013

393: ELMWOOD AVENUE & U of R

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Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑
Volume (vph)	801	54	936	36	26
Turn Type		pm+pt			Perm
Protected Phases	1	3	1 3	2	
Permitted Phases		1 3			2
Detector Phase	1	3	1 3	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	71.0	13.0	84.0	31.0	31.0
Total Split (%)	61.7%	11.3%	73.0%	27.0%	27.0%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effct Green (s)	68.0	78.0	81.0	28.0	28.0
Actuated g/C Ratio	0.59	0.68	0.70	0.24	0.24
v/c Ratio	0.45	0.14	0.42	0.09	0.07
Control Delay	14.6	3.1	5.6	34.5	12.3
Queue Delay	0.0	0.0	0.6	0.0	0.0
Total Delay	14.6	3.1	6.1	34.5	12.3
LOS	B	A	A	C	B
Approach Delay	14.6		6.0	25.2	
Approach LOS	B		A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay: 10.4
 Intersection Capacity Utilization 41.7%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 393: ELMWOOD AVENUE & U of R



Timings
395: Crittenden Blvd & East Dr

7/11/2013
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Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↶	↷	↷	↶	↷
Volume (vph)	71	308	575	95	107
Turn Type	Perm				Perm
Protected Phases		1	1	2	
Permitted Phases	1				2
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	15.0	15.0
Total Split (s)	61.0	61.0	61.0	54.0	54.0
Total Split (%)	53.0%	53.0%	53.0%	47.0%	47.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	93.2	93.2	93.2	15.8	15.8
Actuated g/C Ratio	0.81	0.81	0.81	0.14	0.14
v/c Ratio	0.16	0.12	0.29	0.44	0.37
Control Delay	3.7	2.6	5.1	50.4	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	2.6	5.1	50.4	10.9
LOS	A	A	A	D	B
Approach Delay		2.8	5.1	29.5	
Approach LOS		A	A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.44
 Intersection Signal Delay: 8.2
 Intersection Capacity Utilization 42.0%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	25	1	61	2	166	1605	41	1127
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	14.0	39.0	14.0	39.0
Total Split (s)	32.0	32.0	32.0	32.0	14.0	69.0	14.0	69.0
Total Split (%)	27.8%	27.8%	27.8%	27.8%	12.2%	60.0%	12.2%	60.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	13.2	13.2	13.2	13.2	92.8	81.1	92.8	81.1
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.81	0.71	0.81	0.71
v/c Ratio	0.43	0.08	0.43	0.61	0.48	0.77	0.18	0.54
Control Delay	66.4	20.8	54.5	21.8	11.3	12.0	11.7	1.4
Queue Delay	0.7	0.0	0.0	0.5	0.0	0.7	0.0	0.4
Total Delay	67.2	20.8	54.5	22.3	11.3	12.8	11.7	1.8
LOS	E	C	D	C	B	B	B	A
Approach Delay		51.0		30.7		12.6		2.1
Approach LOS		D		C		B		A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 10.5
 Intersection Capacity Utilization 79.9%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 470: MCH & E Henrietta





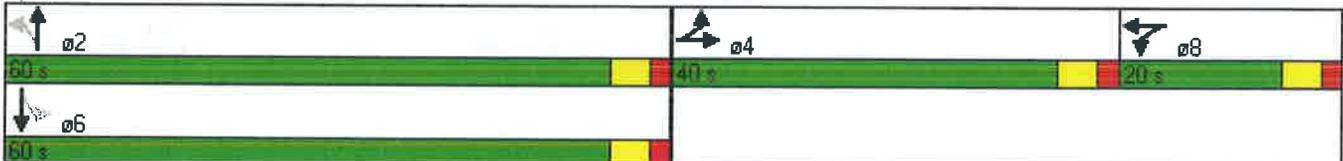
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↔	↕	↖	↕	↖	↕
Volume (vph)	333	9	1	48	815	27	1390
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	40.0	40.0	20.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	16.7%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	25.7	25.7	8.0	83.9	83.9	83.9	83.9
Actuated g/C Ratio	0.21	0.21	0.07	0.70	0.70	0.70	0.70
v/c Ratio	0.69	0.64	0.05	0.82	0.37	0.09	1.12
Control Delay	53.0	43.6	0.3	94.7	9.3	9.8	77.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	49.1
Total Delay	53.0	43.6	0.3	94.7	9.3	9.8	126.7
LOS	D	D	A	F	A	A	F
Approach Delay		48.4	0.3		14.0		125.4
Approach LOS		D	A		B		F

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 105 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 90.1
 Intersection Capacity Utilization 96.2%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service F

Splits and Phases: 500: Crittenden & E Henrietta

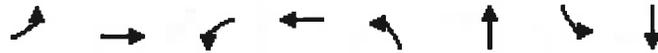


Timings

7/11/2013

501: Southland Drive & West Henrietta Road

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔	↔	↔	↔	↔
Volume (vph)	35	1	7	1	1	1108	72	1417
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	74.0	74.0	14.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	67.3%	67.3%	12.7%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.6		10.6	86.9	86.9	95.5	96.1
Actuated g/C Ratio		0.10		0.10	0.79	0.79	0.87	0.87
v/c Ratio		0.30		0.15	0.00	0.45	0.20	0.52
Control Delay		45.7		27.1	3.0	8.0	2.6	2.9
Queue Delay		0.0		0.0	0.0	0.1	0.0	0.2
Total Delay		45.7		27.1	3.0	8.1	2.6	3.2
LOS		D		C	A	A	A	A
Approach Delay		45.7		27.1		8.1		3.1
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 65 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 6.1

Intersection LOS: A

Intersection Capacity Utilization 58.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 501: Southland Drive & West Henrietta Road

Timings
502: Doncaster Road & West Henrietta Road

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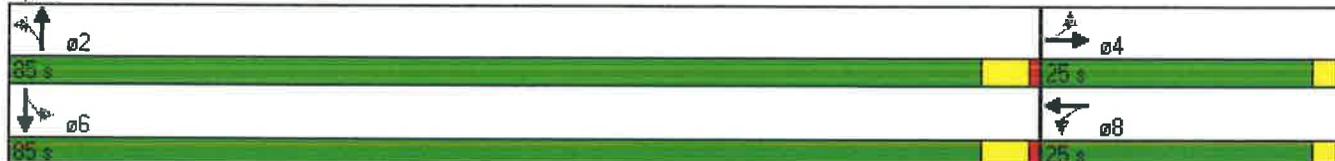


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Volume (vph)	10	1	3	2	1	1114	10	1414
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		6.4		6.4		104.6		104.6
Actuated g/C Ratio		0.06		0.06		0.95		0.95
v/c Ratio		0.12		0.14		0.39		0.50
Control Delay		48.3		33.9		2.6		2.0
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		48.3		33.9		2.6		2.0
LOS		D		C		A		A
Approach Delay		48.3		33.9		2.6		2.0
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 75 (68%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.50
 Intersection Signal Delay: 2.6
 Intersection Capacity Utilization 56.2%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 502: Doncaster Road & West Henrietta Road



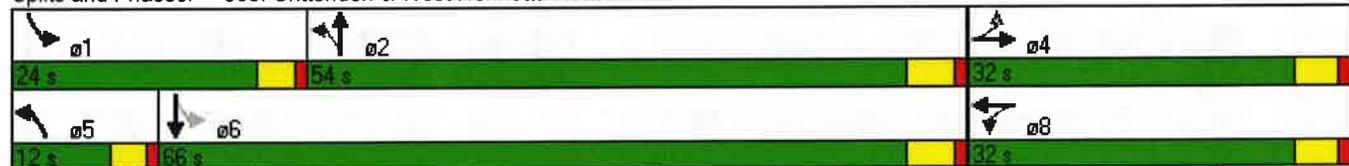


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔	↖	↗	↖	↗
Volume (vph)	102	170	215	40	23	777	328	1066
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	9.0	25.0	8.0	25.0
Total Split (s)	32.0	32.0	32.0	32.0	12.0	54.0	24.0	66.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	10.9%	49.1%	21.8%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)		25.7		25.7	64.7	57.6	78.3	72.1
Actuated g/C Ratio		0.23		0.23	0.59	0.52	0.71	0.66
v/c Ratio		0.95dl		0.87	0.08	0.56	0.78	0.52
Control Delay		51.2		40.3	9.2	31.8	26.3	8.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		51.2		40.3	9.2	31.8	26.3	8.4
LOS		D		D	A	C	C	A
Approach Delay		51.2		40.3		31.2		12.5
Approach LOS		D		D		C		B

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 26.4
 Intersection LOS: C
 Intersection Capacity Utilization 82.1%
 ICU Level of Service E
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 503: Crittenden & West Henrietta Road



Timings
504: BHTL & West Henrietta Road

7/11/2013
University of Rochester < October 2011 Revision



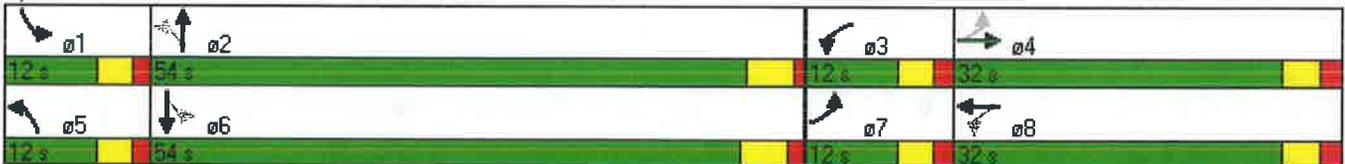
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	148	333	121	299	36	700	205	929
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	12.0	32.0	12.0	32.0	12.0	54.0	12.0	54.0
Total Split (%)	10.9%	29.1%	10.9%	29.1%	10.9%	49.1%	10.9%	49.1%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	29.2	20.2	29.2	20.2	64.0	56.0	71.8	64.9
Actuated g/C Ratio	0.27	0.18	0.27	0.18	0.58	0.51	0.65	0.59
v/c Ratio	0.72	0.60	0.54	0.66	0.15	0.56	0.59	0.62
Control Delay	48.6	44.2	37.7	42.9	9.4	19.9	22.7	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	44.2	37.7	42.9	9.4	19.9	22.7	26.0
LOS	D	D	D	D	A	B	C	C
Approach Delay		45.5		41.6		19.5		25.5
Approach LOS		D		D		B		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 29.4
 Intersection Capacity Utilization 69.4%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 504: BHTL & West Henrietta Road



HCM Unsignalized Intersection Capacity Analysis
505: Crittenden & East River Road

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	58	8	388	113	2	159
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	64	9	431	126	2	177
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	675	494			557	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	675	494			557	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	98			100	
cM capacity (veh/h)	418	575			1014	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	73	557	179
Volume Left	64	0	2
Volume Right	9	126	0
cSH	432	1700	1014
Volume to Capacity	0.17	0.33	0.00
Queue Length 95th (ft)	15	0	0
Control Delay (s)	15.0	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	15.0	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		37.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
506: East River Road &

7/11/2013
University of Rochester < October 2011 Revision



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↓			↑↑	↘	↗
Volume (veh/h)	1208	138	158	791	76	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1313	150	172	860	83	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	783			1130		
pX, platoon unblocked					0.81	
vC, conflicting volume			1463		2161	732
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1463		1961	732
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			62		0	90
cM capacity (veh/h)			458		28	364

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	875	588	458	573	83	37
Volume Left	0	0	172	0	83	0
Volume Right	0	150	0	0	0	37
cSH	1700	1700	458	1700	28	364
Volume to Capacity	0.51	0.35	0.38	0.34	2.96	0.10
Queue Length 95th (ft)	0	0	43	0	249	8
Control Delay (s)	0.0	0.0	11.5	0.0	1178.9	16.0
Lane LOS			B		F	C
Approach Delay (s)	0.0		5.1		819.5	
Approach LOS					F	

Intersection Summary						
Average Delay			39.5			
Intersection Capacity Utilization			78.5%		ICU Level of Service	D
Analysis Period (min)			15			

Intersection							
Intersection Delay (sec/veh)	3.3						
Intersection LOS	A						
Approach	EB		WB		NB		SB
Entry Lanes	2		2		1		2
Conflicting Circle Lanes	2		2		2		2
Adjusted Approach Flow (vph)	398		1396		95		327
Demand Flow Rate (pc/h)	406		1424		97		334
Vehicles Circulating (pc/h)	287		257		605		306
Vehicles Exiting (pc/h)	353		445		88		247
Follow-Up Headway (s)	3.186		3.186		3.186		3.186
Ped Vol. Crossing Leg (#/hr)	0		0		0		0
Ped Capacity Adjustment	1.000		1.000		1.000		1.000
Approach Delay (sec/veh)	6.2		1.5		6.4		6.5
Approach LOS	A		A		A		A
Lane	Left	Right	Left	Bypass	Left	Left	Right
Designated moves	LT	TR	LT	R	LTR	LT	R
Assumed Moves	L	TR	LT	R	LTR	LT	R
Right Turn Channelized	Free						
Lane Utilization	0.507	0.493	1.000		1.000	0.746	0.254
Critical Headway (s)	4.293	4.113	4.293		4.113	4.293	4.113
Entry Flow Rate (pc/h)	206	200	296	1128	97	249	85
Capacity, Entry Lane (pc/h)	911	924	932	1938	740	898	912
Entry HV Adjustment Factor	0.981	0.979	0.980	0.980	0.981	0.979	0.976
Flow Rate, Entry (vph)	202	196	290	1106	95	244	83
Capacity, Entry (vph)	893	905	913	1900	726	879	891
Volume to Capacity Ratio	0.226	0.216	0.318	0.582	0.131	0.277	0.093
Control Delay (sec/veh)	6.3	6.2	7.4	0.0	6.4	7.0	4.9
Level of Service	A	A	A	A	A	A	A
95th-Percentile Queue (veh)	1	1	1	4	0	1	0

PM Peak Hour

Build Conditions with Mitigation 5-Year

TY·LININTERNATIONAL

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HCM Unsignalized Intersection Capacity Analysis
 2: East River Road & Kendrick

7/11/2013
 University of Rochester, IPD



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized						Yes						
Volume (veh/h)	93	96	60	28	112	387	14	19	60	592	26	179
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	103	107	67	31	124	430	16	21	67	658	29	199
Approach Volume (veh/h)		277			156			103			886	
Crossing Volume (veh/h)		718			140			868			171	
High Capacity (veh/h)		783			1241			694			1211	
High v/c (veh/h)		0.35			0.13			0.15			0.73	
Low Capacity (veh/h)		622			1031			544			1004	
Low v/c (veh/h)		0.44			0.15			0.19			0.88	
Intersection Summary												
Maximum v/c High			0.73									
Maximum v/c Low			0.88									
Intersection Capacity Utilization			73.2%		ICU Level of Service						D	

Timings
3: College Town & Mt. Hope

7/11/2013
University of Rochester, IPD



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	36	97	84	1390	1308
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	90.0	90.0	90.0
Total Split (%)	18.2%	18.2%	81.8%	81.8%	81.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	8.2	8.2	93.8	93.8	93.8
Actuated g/C Ratio	0.07	0.07	0.85	0.85	0.85
v/c Ratio	0.30	0.53	0.37	0.51	0.49
Control Delay	53.0	23.0	10.6	8.4	0.9
Queue Delay	0.0	0.0	0.0	0.7	0.2
Total Delay	53.0	23.0	10.6	9.1	1.1
LOS	D	C	B	A	A
Approach Delay	31.1			9.2	1.1
Approach LOS	C			A	A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 6.5
 Intersection Capacity Utilization 55.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 3: College Town & Mt. Hope

Intersection Sign configuration not allowed in HCM analysis.

Timings
6: East River Road & Mt. Hope

7/11/2013
University of Rochester, IPD



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Configurations									
Volume (vph)	257	267	334	151	231	90	1368	333	920
Turn Type	Split		Perm	Split		pm+pt		Perm	
Protected Phases	4	4		8	8	5	2		6
Permitted Phases			4			2		2	
Detector Phase	4	4	4	8	8	5	2	2	6
Switch Phase									
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0	3.0
Minimum Split (s)	15.0	15.0	15.0	15.0	15.0	8.0	29.0	29.0	25.5
Total Split (s)	28.0	28.0	28.0	22.0	22.0	8.0	60.0	60.0	52.0
Total Split (%)	25.5%	25.5%	25.5%	20.0%	20.0%	7.3%	54.5%	54.5%	47.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	0.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	2.0	3.0	4.0	3.0
Lead/Lag						Lead			Lag
Lead-Lag Optimize?						Yes			
Recall Mode	None	None	None	None	None	Min	C-Max	C-Max	C-Max
Act Effect Green (s)	22.9	22.9	22.9	16.9	16.9	62.3	61.3	60.3	51.8
Actuated g/C Ratio	0.21	0.21	0.21	0.15	0.15	0.57	0.56	0.55	0.47
v/c Ratio	0.73	0.73	0.50	0.62	0.65	0.53	0.54	0.36	0.86
Control Delay	54.2	43.1	13.2	53.6	43.0	24.4	21.0	6.6	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.2	43.1	13.2	53.6	43.0	24.4	21.0	6.6	24.8
LOS	D	D	B	D	D	C	C	A	C
Approach Delay		39.1			46.3		18.5		24.8
Approach LOS		D			D		B		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 27.4
 Intersection Capacity Utilization 76.8%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 6: East River Road & Mt. Hope



Timings

7/11/2013

8: I-390 SB Ramp & E Henrietta

University of Rochester, IPD



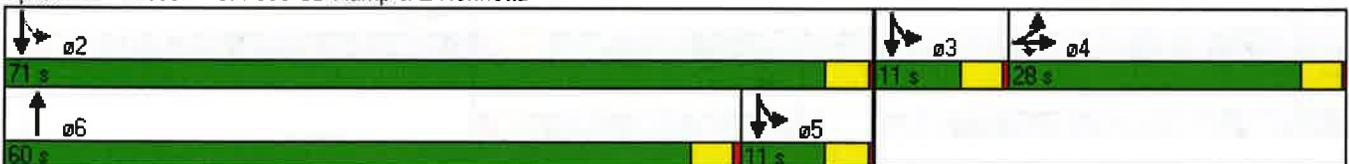
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	ø2	ø3	ø5
Lane Configurations										
Volume (vph)	222	436	494	1343	789	475	1274			
Turn Type	Split		Perm		Free	pm+pt				
Protected Phases	4	4		6		3 5	2 3 5	2	3	5
Permitted Phases			4		Free	2 3 5				
Detector Phase	4	4	4	6		3 5	2 3 5			
Switch Phase										
Minimum Initial (s)	3.0	3.0	3.0	4.0				4.0	4.0	3.0
Minimum Split (s)	25.0	25.0	25.0	20.0				20.0	20.0	8.0
Total Split (s)	28.0	28.0	28.0	60.0	0.0	22.0	93.0	71.0	11.0	11.0
Total Split (%)	25.5%	25.5%	25.5%	54.5%	0.0%	20.0%	84.5%	65%	10%	10%
Yellow Time (s)	3.5	3.5	3.5	3.5				3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5				0.5	0.5	0.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0			
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lead/Lag	Lag	Lag	Lag	Lead					Lead	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	C-Max				C-Max	None	Min
Act Effct Green (s)	25.0	25.0	25.0	57.0	110.0	79.0	79.0			
Actuated g/C Ratio	0.23	0.23	0.23	0.52	1.00	0.72	0.72			
v/c Ratio	0.61	1.00	0.85	0.81	0.55	0.73	0.56			
Control Delay	45.3	72.7	50.7	26.6	1.4	34.8	8.3			
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0			
Total Delay	45.3	72.7	50.7	27.0	1.4	34.8	8.3			
LOS	D	E	D	C	A	C	A			
Approach Delay		62.3		17.5			15.5			
Approach LOS		E		B			B			

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 73 (66%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 27.1
 Intersection Capacity Utilization 76.5%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 8: I-390 SB Ramp & E Henrietta



Timings
9: East River Road & I-390 S On Ramp

7/11/2013
University of Rochester, IPD



Lane Group	EBL	EBT	WBT	SEL	SER
Lane Configurations					
Volume (vph)	526	222	364	609	157
Turn Type	pm+pt				Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	3.0	10.0	10.0	5.0	5.0
Minimum Split (s)	13.0	20.0	20.0	10.0	10.0
Total Split (s)	22.0	60.0	38.0	30.0	30.0
Total Split (%)	24.4%	66.7%	42.2%	33.3%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	-2.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	3.0	5.0
Lead/Lag	Lag		Lead		
Lead-Lag Optimize?	Yes				
Recall Mode	None	None	None	None	None
Act Effct Green (s)	40.9	40.9	22.6	21.5	19.4
Actuated g/C Ratio	0.58	0.58	0.32	0.30	0.27
v/c Ratio	0.63	0.39	0.75	0.65	0.31
Control Delay	25.2	10.1	27.2	26.1	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.2	10.1	27.2	26.1	5.9
LOS	C	B	C	C	A
Approach Delay		15.4	27.2	21.9	
Approach LOS		B	C	C	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 70.8
 Natural Cycle: 55
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 21.4
 Intersection Capacity Utilization 64.6%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 9: East River Road & I-390 S On Ramp





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	129	374	395	319	148	1048	232	254	1253
Turn Type	pm+pt		Prot		pm+pt		custom	pm+pt	
Protected Phases	5	2	1	6	7	4		3	8
Permitted Phases	2				4		2	8	
Detector Phase	5	2	1	6	7	4	2	3	8
Switch Phase									
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	10.0	7.0	5.0	7.0
Minimum Split (s)	10.0	32.0	10.0	32.0	10.0	32.0	32.0	10.0	32.0
Total Split (s)	20.0	28.0	20.0	28.0	19.0	53.0	28.0	19.0	53.0
Total Split (%)	16.7%	23.3%	16.7%	23.3%	15.8%	44.2%	23.3%	15.8%	44.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	1.0	2.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	C-Max	None	Max
Act Effct Green (s)	42.0	25.0	17.0	25.0	66.0	50.0	24.0	66.0	50.0
Actuated g/C Ratio	0.35	0.21	0.14	0.21	0.55	0.42	0.20	0.55	0.42
v/c Ratio	0.46	0.81	0.90	0.73	0.55	0.79	0.60	0.94	1.01
Control Delay	30.7	50.6	73.7	43.5	28.8	35.2	25.6	71.8	60.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	31.1	0.0	0.0	0.0
Total Delay	30.7	50.6	73.7	43.5	28.8	66.4	25.6	71.8	60.4
LOS	C	D	E	D	C	E	C	E	E
Approach Delay		46.8		56.7		55.9			62.2
Approach LOS		D		E		E			E

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 56.9
 Intersection Capacity Utilization 85.6%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service E

Splits and Phases: 10: Westfall & E Henrietta

Timings
11: South & E Henrietta

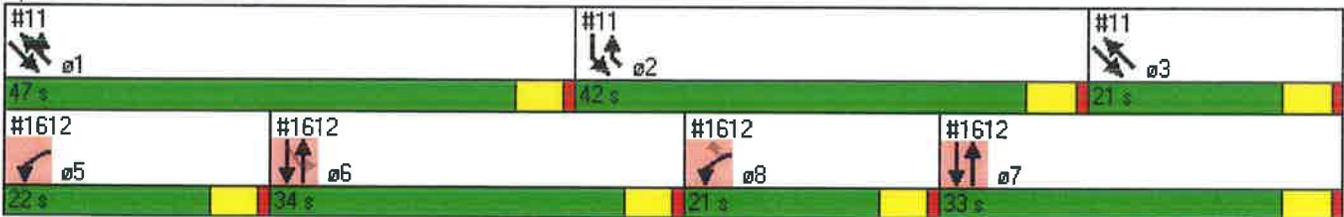
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Lane Group	SBL	SET	NWT	NWR	ø1	ø3	ø5	ø6	ø7	ø8
Lane Configurations										
Volume (vph)	656	816	708	642						
Turn Type				custom						
Protected Phases	2	13	13	12	1	3	5	6	7	8
Permitted Phases		13		12						
Detector Phase	2	13	13	12						
Switch Phase										
Minimum Initial (s)	10.0				24.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	21.0	33.0	33.0	13.0
Total Split (s)	42.0	68.0	68.0	89.0	47.0	21.0	22.0	34.0	33.0	21.0
Total Split (%)	38.2%	61.8%	61.8%	80.9%	43%	19%	20%	31%	30%	19%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0						
Total Lost Time (s)	3.0	3.0	3.0	3.0						
Lead/Lag	Lag				Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None				C-Max	None	C-Max	None	None	None
Act Effct Green (s)	34.1	69.9	69.9	81.8						
Actuated g/C Ratio	0.31	0.64	0.64	0.74						
v/c Ratio	0.68	0.44	0.67	0.52						
Control Delay	32.1	17.6	17.2	1.7						
Queue Delay	1.6	0.0	0.4	0.0						
Total Delay	33.6	17.6	17.6	1.7						
LOS	C	B	B	A						
Approach Delay	33.6	17.6	10.1							
Approach LOS	C	B	B							

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NWSE and 5:, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 17.7
 Intersection Capacity Utilization 62.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 11: South & E Henrietta



Timings
12: Crittenden Blvd & Mt. Hope

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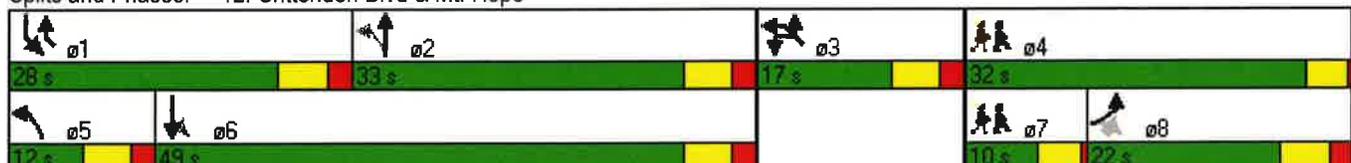


Lane Group	EBL	EBR	EBR2	NBL	NBT	SBL	SBT	NWL	NWR	ø4	ø7
Lane Configurations											
Volume (vph)	206	292	225	146	809	409	939	142	458		
Turn Type		Perm	Perm	pm+pt		pm+pt			custom		
Protected Phases	8			5	2	1	6	3	3	4	7
Permitted Phases		8	8	2		6			3		
Detector Phase	8	8	8	5	2	1	6	3	3		
Switch Phase											
Minimum Initial (s)	12.0	12.0	12.0	5.0	7.0	5.0	7.0	6.0		4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	12.0	27.0	12.0	27.0	16.0		20.0	8.0
Total Split (s)	22.0	22.0	22.0	12.0	33.0	28.0	49.0	17.0	45.0	32.0	10.0
Total Split (%)	20.0%	20.0%	20.0%	10.9%	30.0%	25.5%	44.5%	15.5%	40.9%	29%	9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		0.5	0.5
Lost Time Adjust (s)	-3.0	-3.0	-1.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lag				Lead
Lead-Lag Optimize?											Yes
Recall Mode	None	None	None	None	C-Max	None	C-Max	None		None	None
Act Effct Green (s)	29.1	29.1	27.1	39.0	30.0	58.0	46.0	13.9	38.9		
Actuated g/C Ratio	0.26	0.26	0.25	0.35	0.27	0.53	0.42	0.13	0.35		
v/c Ratio	0.49	0.77	0.64	0.72	0.96	0.97	0.75	0.75	0.74		
Control Delay	38.4	51.5	45.8	42.7	44.9	53.9	21.3	74.9	20.9		
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0		
Total Delay	38.6	51.5	45.8	42.7	44.9	53.9	21.8	74.9	21.0		
LOS	D	D	D	D	D	D	C	E	C		
Approach Delay	46.0				44.6		31.1	34.3			
Approach LOS	D				D		C	C			

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 67 (61%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 38.1
 Intersection LOS: D
 Intersection Capacity Utilization 78.8%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 12: Crittenden Blvd & Mt. Hope



Timings
13: Elmwood Ave & Mt. Hope

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Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	424	935	201	230	581	162	872	78	908
Turn Type	pm+pt		Perm	pm+pt		pm+pt		pm+pt	
Protected Phases	3	8		7	4	5	2	1	6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	7	4	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	4.0	7.0	4.0	7.0
Minimum Split (s)	12.0	31.0	31.0	12.0	31.0	10.0	33.0	10.0	33.0
Total Split (s)	27.0	41.0	41.0	17.0	31.0	11.0	42.0	10.0	41.0
Total Split (%)	24.5%	37.3%	37.3%	15.5%	28.2%	10.0%	38.2%	9.1%	37.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-1.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	54.6	37.7	35.7	41.4	27.6	47.8	41.4	45.0	38.0
Actuated g/C Ratio	0.50	0.34	0.32	0.38	0.25	0.43	0.38	0.41	0.35
v/c Ratio	1.03	0.86	0.36	0.87	0.76	0.88	1.07	0.48	1.03
Control Delay	74.2	38.1	9.9	56.5	44.4	68.0	68.0	26.9	70.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.2	38.1	9.9	56.5	44.4	68.0	68.0	26.9	70.3
LOS	E	D	A	E	D	E	E	C	E
Approach Delay		44.3			47.8		68.0		67.5
Approach LOS		D			D		E		E

Intersection Summary

Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 7 (6%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 57.1	Intersection LOS: E
Intersection Capacity Utilization 94.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 13: Elmwood Ave & Mt. Hope

Timings
14: Lattimore & Mt. Hope

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Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	102	35	878	1248
Turn Type	Perm			
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	27.0	24.0	24.0	24.0
Total Split (s)	38.0	72.0	72.0	72.0
Total Split (%)	34.5%	65.5%	65.5%	65.5%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	C-Max	C-Max	C-Max
Act Effct Green (s)	20.7		83.3	83.3
Actuated g/C Ratio	0.19		0.76	0.76
v/c Ratio	0.70		0.45	0.52
Control Delay	42.1		5.7	14.2
Queue Delay	0.0		0.0	0.0
Total Delay	42.1		5.7	14.2
LOS	D		A	B
Approach Delay	42.1		5.7	14.2
Approach LOS	D		A	B

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 13.6
 Intersection Capacity Utilization 70.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 14: Lattimore & Mt. Hope



Timings
15: Westfall & Mt. Hope

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Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↗	↖	↗	↖	↕	↗	↖	↕
Volume (vph)	10	174	256	445	128	77	794	207	123	1229
Turn Type	Perm		custom	pm+pt		pm+pt		Perm	pm+pt	
Protected Phases		4	4	3	3 4	2	1		2	1
Permitted Phases	4		4	3 4		1		1	1	
Detector Phase	4	4	4	3	3 4	2	1	1	2	1
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0		5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	26.0	26.0	26.0	11.0		13.0	40.0	40.0	13.0	40.0
Total Split (s)	26.0	26.0	26.0	25.0	51.0	15.0	44.0	44.0	15.0	44.0
Total Split (%)	23.6%	23.6%	23.6%	22.7%	46.4%	13.6%	40.0%	40.0%	13.6%	40.0%
Yellow Time (s)	4.0	4.0	4.0	3.0		3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	1.0	2.0		2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	None	None	None		None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		20.2	20.2	45.4	48.4	52.6	43.8	42.8	52.6	43.8
Actuated g/C Ratio		0.18	0.18	0.41	0.44	0.48	0.40	0.39	0.48	0.40
v/c Ratio		0.61	0.66	0.93	0.33	0.41	0.63	0.30	0.50	0.98
Control Delay		49.0	23.5	52.0	17.3	17.0	16.6	3.0	25.2	51.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		49.0	23.5	52.0	17.3	17.0	16.6	3.0	25.2	51.2
LOS		D	C	D	B	B	B	A	C	D
Approach Delay		34.2			39.9		14.1			48.8
Approach LOS		C			D		B			D

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 34.8
 Intersection Capacity Utilization 86.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 15: Westfall & Mt. Hope

Timings
18: Iola & E Henrietta

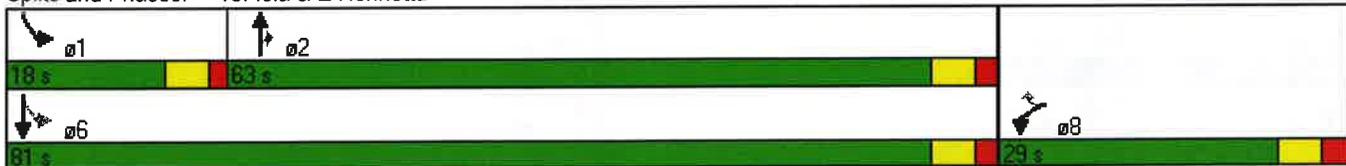
	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↖	↑↑	↗	↘	↑↑
Volume (vph)	194	221	1271	179	160	1722
Turn Type	Perm			Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	21.5	21.5	9.0	21.5
Total Split (s)	29.0	29.0	63.0	63.0	18.0	81.0
Total Split (%)	26.4%	26.4%	57.3%	57.3%	16.4%	73.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.0	2.0	1.5	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.0	5.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	18.1	18.1	64.9	64.9	80.9	80.4
Actuated g/C Ratio	0.16	0.16	0.59	0.59	0.74	0.73
v/c Ratio	0.74	0.55	0.68	0.20	0.61	0.74
Control Delay	58.6	11.8	7.1	0.4	22.0	12.2
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.2
Total Delay	58.6	11.8	7.2	0.4	22.0	12.3
LOS	E	B	A	A	C	B
Approach Delay	33.7		6.3			13.1
Approach LOS	C		A			B

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 12.8
 Intersection Capacity Utilization 68.5%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 18: Iola & E Henrietta



Timings

7/11/2013

21: Crittenden Blvd & Kendrick

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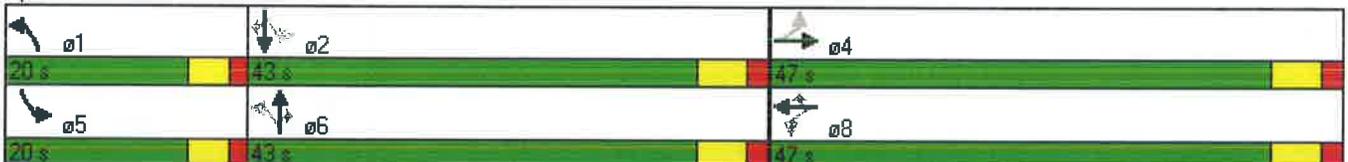
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	187	250	83	64	293	30	714	89	173	408	69
Turn Type	Perm		Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases		4		8		1	6		5	2	
Permitted Phases	4		8		8	6		6	2		2
Detector Phase	4	4	8	8	8	1	6	6	5	2	2
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	11.0	10.0	10.0	6.0	10.0	10.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	20.0	32.0	32.0	20.0	32.0	32.0
Total Split (s)	47.0	47.0	47.0	47.0	47.0	20.0	43.0	43.0	20.0	43.0	43.0
Total Split (%)	42.7%	42.7%	42.7%	42.7%	42.7%	18.2%	39.1%	39.1%	18.2%	39.1%	39.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.5	2.0	2.0	1.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-3.0	-1.0	-2.0	-3.0	-3.0	-2.0	-3.0	-3.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	Min	Min	Min	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	32.3	32.3		32.3	30.3	68.3	55.6	55.6	68.3	55.7	55.7
Actuated g/C Ratio	0.29	0.29		0.29	0.28	0.62	0.51	0.51	0.62	0.51	0.51
v/c Ratio	0.73	0.68		0.75	0.51	0.06	0.90	0.13	0.68	0.51	0.10
Control Delay	48.9	38.8		55.4	5.7	9.6	42.5	12.3	41.2	7.5	5.6
Queue Delay	1.0	0.0		0.0	0.2	0.0	0.0	0.0	0.0	0.3	0.0
Total Delay	49.8	38.8		55.4	5.9	9.6	42.5	12.3	41.2	7.7	5.6
LOS	D	D		E	A	A	D	B	D	A	A
Approach Delay		43.0		22.4			38.1			16.4	
Approach LOS		D		C			D			B	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 14 (13%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 30.4
 Intersection Capacity Utilization 85.5%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings
22: Elmwood Ave & Kendrick

7/11/2013
University of Rochester, IPD



Lane Group	EBT	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↑↑	↑↑
Volume (vph)	621	150	848	671
Turn Type		pm+pt		
Protected Phases	1	3	1 3	2
Permitted Phases		1 3		
Detector Phase	1	3	1 3	2
Switch Phase				
Minimum Initial (s)	15.0	4.0		10.0
Minimum Split (s)	34.0	10.0		26.0
Total Split (s)	50.0	13.0	63.0	47.0
Total Split (%)	45.5%	11.8%	57.3%	42.7%
Yellow Time (s)	4.0	3.5		4.0
All-Red Time (s)	1.0	1.5		1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lead			Lag
Lead-Lag Optimize?				
Recall Mode	C-Max	None		None
Act Effct Green (s)	47.0	57.2	60.2	43.8
Actuated g/C Ratio	0.43	0.52	0.55	0.40
v/c Ratio	0.80	0.72	0.49	0.92
Control Delay	26.9	55.0	13.5	31.2
Queue Delay	0.0	0.0	0.0	1.7
Total Delay	26.9	55.0	13.5	32.9
LOS	C	D	B	C
Approach Delay	26.9		19.8	32.9
Approach LOS	C		B	C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 26.9
 Intersection Capacity Utilization 86.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 22: Elmwood Ave & Kendrick



HCM Unsignalized Intersection Capacity Analysis
 25: Lattimore & Kendrick

7/11/2013
 University of Rochester, IPD



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	116	133	720	82	104	477
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	129	148	800	91	116	530
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						795
pX, platoon unblocked	0.90					
vC, conflicting volume	1607	846			891	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1618	846			891	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	59			85	
cM capacity (veh/h)	87	362			761	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	129	148	891	116	530
Volume Left	129	0	0	116	0
Volume Right	0	148	91	0	0
cSH	87	362	1700	761	1700
Volume to Capacity	1.48	0.41	0.52	0.15	0.31
Queue Length 95th (ft)	251	48	0	13	0
Control Delay (s)	351.0	21.6	0.0	10.6	0.0
Lane LOS	F	C		B	
Approach Delay (s)	175.0		0.0	1.9	
Approach LOS	F				

Intersection Summary					
Average Delay			27.4		
Intersection Capacity Utilization			65.1%	ICU Level of Service	C
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
 26: Lot #1 & Kendrick

7/11/2013
 University of Rochester, IPD



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	85	44	781	567	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	94	49	868	630	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)					957	
pX, platoon unblocked	0.94	0.94	0.94			
vC, conflicting volume	1599	634	638			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1606	575	579			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	81	95			
cM capacity (veh/h)	103	485	931			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	96	49	868	638		
Volume Left	1	49	0	0		
Volume Right	94	0	0	8		
cSH	465	931	1700	1700		
Volume to Capacity	0.21	0.05	0.51	0.38		
Queue Length 95th (ft)	19	4	0	0		
Control Delay (s)	14.7	9.1	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	14.7	0.5		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			53.1%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
27: Westmoreland & Kendrick

7/11/2013
University of Rochester, IPD

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	90	1	46	42	12	76	15	400	15	156	979	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	1	50	46	13	83	16	435	16	170	1064	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						8						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1927	1888	1065	1929	1880	443	1065			451		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1927	1888	1065	1929	1880	443	1065			451		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	98	82	0	78	87	98			85		
cM capacity (veh/h)	31	58	271	35	59	615	654			1109		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	149	141	467	170	1065							
Volume Left	98	46	16	170	0							
Volume Right	50	83	16	0	1							
cSH	45	95	654	1109	1700							
Volume to Capacity	3.32	1.48	0.02	0.15	0.63							
Queue Length 95th (ft)	Err	267	2	13	0							
Control Delay (s)	Err	342.7	0.7	8.8	0.0							
Lane LOS	F	F	A	A								
Approach Delay (s)	Err	342.7	0.7	1.2								
Approach LOS	F	F										
Intersection Summary												
Average Delay			772.6									
Intersection Capacity Utilization			98.9%		ICU Level of Service				F			
Analysis Period (min)			15									

Timings

91: Elmwood Ave & East Dr

7/11/2013

University of Rochester, IPD

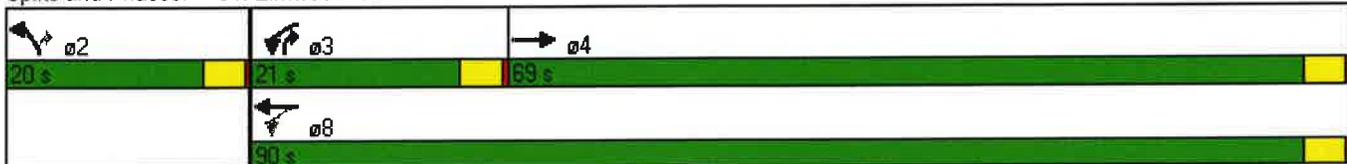


Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑
Volume (vph)	1236	107	864	115	265
Turn Type		pm+pt			pm+ov
Protected Phases	4	3	8	2	3
Permitted Phases		8			2
Detector Phase	4	3	8	2	3
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0	8.0
Total Split (s)	69.0	21.0	90.0	20.0	21.0
Total Split (%)	62.7%	19.1%	81.8%	18.2%	19.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes			Yes
Recall Mode	None	None	C-Max	Min	None
Act Effct Green (s)	75.1	89.2	89.2	12.8	26.9
Actuated g/C Ratio	0.68	0.81	0.81	0.12	0.24
v/c Ratio	0.64	0.38	0.33	0.62	0.69
Control Delay	3.6	5.7	0.2	59.3	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.6	5.7	0.2	59.3	39.4
LOS	A	A	A	E	D
Approach Delay	3.6		0.8	45.4	
Approach LOS	A		A	D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 96 (87%), Referenced to phase 8:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 8.5
 Intersection Capacity Utilization 61.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 91: Elmwood Ave & East Dr



HCM Unsignalized Intersection Capacity Analysis
 100: CTSB & Kendrick

7/11/2013
 University of Rochester, IPD



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		+			+
Volume (veh/h)	91	45	796	48	25	527
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	101	50	884	53	28	586
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						393
pX, platoon unblocked	0.83					
vC, conflicting volume	1552	911			938	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1563	911			938	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	85			96	
cM capacity (veh/h)	98	332			731	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	151	938	613
Volume Left	101	0	28
Volume Right	50	53	0
cSH	127	1700	731
Volume to Capacity	1.19	0.55	0.04
Queue Length 95th (ft)	229	0	3
Control Delay (s)	204.5	0.0	1.0
Lane LOS	F		A
Approach Delay (s)	204.5	0.0	1.0
Approach LOS	F		

Intersection Summary			
Average Delay		18.5	
Intersection Capacity Utilization		62.5%	ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
109: Kendrick &

7/11/2013
University of Rochester, IPD



Movement	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations			↶	↷	↷	↶
Volume (veh/h)	0	0	48	437	797	277
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	53	486	886	308
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1478	886	1193			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1478	886	1193			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	91			
cM capacity (veh/h)	126	344	585			
Direction, Lane #	NE 1	NE 2	SW 1	SW 2		
Volume Total	53	486	886	308		
Volume Left	53	0	0	0		
Volume Right	0	0	0	308		
cSH	585	1700	1700	1700		
Volume to Capacity	0.09	0.29	0.52	0.18		
Queue Length 95th (ft)	7	0	0	0		
Control Delay (s)	11.8	0.0	0.0	0.0		
Lane LOS	B					
Approach Delay (s)	1.2		0.0			
Approach LOS						
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			45.3%		ICU Level of Service	A
Analysis Period (min)			15			

Timings
162: Elmwood Ave & South

7/11/2013
University of Rochester, IPD



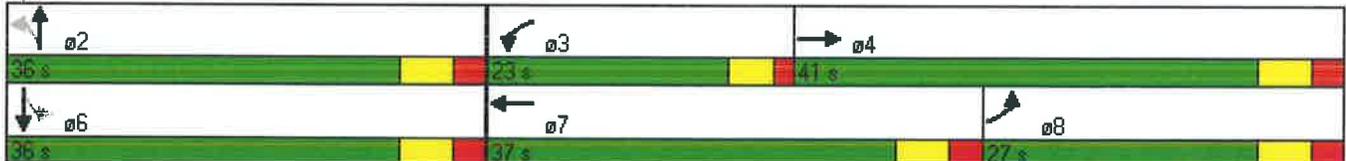
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	193	1160	223	583	6	543	52	442
Turn Type	custom		Prot		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	8				2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	27.0	41.0	23.0	37.0	36.0	36.0	36.0	36.0
Total Split (%)	27.0%	41.0%	23.0%	37.0%	36.0%	36.0%	36.0%	36.0%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?								
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	25.8	39.0	19.0	32.2		33.0		33.0
Actuated g/C Ratio	0.26	0.39	0.19	0.32		0.33		0.33
v/c Ratio	0.47	0.96	0.74	0.60		0.77		0.87
Control Delay	35.8	47.5	52.1	30.7		33.4		43.5
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	35.8	47.5	52.1	30.7		33.4		43.5
LOS	D	D	D	C		C		D
Approach Delay		45.8		36.4		33.4		43.5
Approach LOS		D		D		C		D

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 57 (57%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 40.6
 Intersection Capacity Utilization 98.0%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 162: Elmwood Ave & South



Timings

222: WB Ramp to SB & E Henrietta

7/11/2013

University of Rochester, IPD



Lane Group	EBR	WBR	NBL	NBT	SBT	SBR2
Lane Configurations						
Volume (vph)	260	419	535	1031	1489	455
Turn Type	custom	custom	Prot			Free
Protected Phases	5		5	2	6!	
Permitted Phases		1!				Free
Detector Phase	5	1	5	2	6	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	
Total Split (s)	36.0	30.0	36.0	80.0	74.0	0.0
Total Split (%)	32.7%	27.3%	32.7%	72.7%	67.3%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	C-Max	C-Max	
Act Effect Green (s)	25.3	22.8	25.3	79.2	76.7	110.0
Actuated g/C Ratio	0.23	0.21	0.23	0.72	0.70	1.00
v/c Ratio	0.73	0.81	0.75	0.45	0.67	0.32
Control Delay	45.1	52.9	58.1	6.6	8.5	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0
Total Delay	45.1	52.9	58.1	6.6	8.8	0.4
LOS	D	D	E	A	A	A
Approach Delay				24.2	6.9	
Approach LOS				C	A	

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 20.3

Intersection LOS: C

Intersection Capacity Utilization 81.1%

ICU Level of Service D

Analysis Period (min) 15

! Phase conflict between lane groups.

Splits and Phases: 222: WB Ramp to SB & E Henrietta

Timings
393: Elmwood Ave & U of R

7/11/2013
University of Rochester, IPD



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑
Volume (vph)	1098	34	972	26	39
Turn Type		pm+pt			Perm
Protected Phases	1	3	13	2	
Permitted Phases		13			2
Detector Phase	1	3	13	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	68.0	11.0	79.0	31.0	31.0
Total Split (%)	61.8%	10.0%	71.8%	28.2%	28.2%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effct Green (s)	65.0	73.0	76.0	28.0	28.0
Actuated g/C Ratio	0.59	0.66	0.69	0.25	0.25
v/c Ratio	0.60	0.13	0.44	0.06	0.10
Control Delay	14.8	4.1	4.3	31.7	10.2
Queue Delay	0.0	0.0	0.3	0.0	0.0
Total Delay	14.8	4.1	4.6	31.7	10.2
LOS	B	A	A	C	B
Approach Delay	14.8		4.6	18.8	
Approach LOS	B		A	B	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 10.2
 Intersection Capacity Utilization 43.1%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 393: Elmwood Ave & U of R



Timings
395: Crittenden Blvd & East Dr

7/11/2013
University of Rochester, IPD



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	74	655	360	182	143
Turn Type	Perm				Prot
Protected Phases		1	1	2	2
Permitted Phases	1				
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	15.0	15.0
Total Split (s)	40.0	40.0	40.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	39.2	39.2	39.2	14.8	14.8
Actuated g/C Ratio	0.65	0.65	0.65	0.25	0.25
v/c Ratio	0.15	0.31	0.23	0.46	0.31
Control Delay	5.5	5.3	3.8	22.4	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	5.3	3.8	22.4	5.3
LOS	A	A	A	C	A
Approach Delay		5.3	3.8	14.9	
Approach LOS		A	A	B	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.46
 Intersection Signal Delay: 6.9
 Intersection Capacity Utilization 39.4%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	53	1	216	1	9	1315	160	1636
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	24.0	24.0	24.0	24.0	14.0	39.0	14.0	39.0
Total Split (s)	27.0	27.0	27.0	27.0	13.0	70.0	13.0	70.0
Total Split (%)	24.5%	24.5%	24.5%	24.5%	11.8%	63.6%	11.8%	63.6%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lead		Lag		Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	23.3	23.3	23.3	23.3	77.7	68.0	77.7	68.0
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.71	0.62	0.71	0.62
v/c Ratio	0.27	0.20	0.90	0.30	0.04	0.76	0.75	0.86
Control Delay	39.5	9.6	76.5	8.3	1.3	7.0	50.9	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	56.0
Total Delay	39.5	9.6	76.5	8.3	1.3	7.1	50.9	78.6
LOS	D	A	E	A	A	A	D	E
Approach Delay		22.5		52.3		7.1		76.2
Approach LOS		C		D		A		E

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 3 (3%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 45.2
 Intersection Capacity Utilization 79.1%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 470: MCH & E Henrietta



Timings
500: Crittenden & E Henrietta

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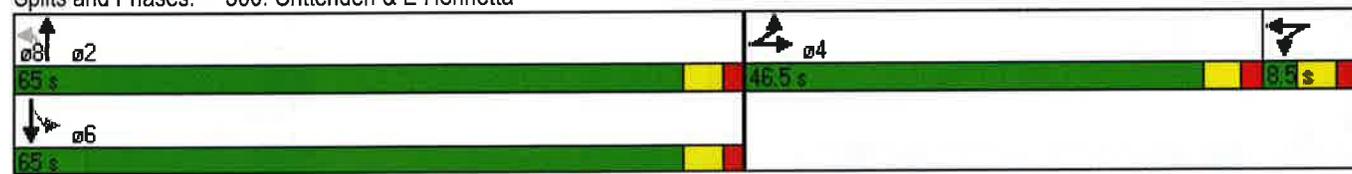


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	881	24	1	82	1228	10	1326
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	46.5	46.5	8.5	65.0	65.0	65.0	65.0
Total Split (%)	38.8%	38.8%	7.1%	54.2%	54.2%	54.2%	54.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	43.5	43.5	5.5	65.4	65.4	65.4	65.4
Actuated g/C Ratio	0.36	0.36	0.05	0.54	0.54	0.54	0.54
v/c Ratio	1.00	0.96	0.19	1.42	0.71	0.12	1.04
Control Delay	74.4	63.8	26.2	291.0	23.5	19.3	58.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	18.4
Total Delay	74.4	63.8	26.2	291.0	23.5	19.3	76.9
LOS	E	E	C	F	C	B	E
Approach Delay		69.2	26.2		40.2		76.6
Approach LOS		E	C		D		E

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.42
 Intersection Signal Delay: 62.9
 Intersection Capacity Utilization 101.6%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service G

Splits and Phases: 500: Crittenden & E Henrietta



Timings
501: Southland Drive & West Henrietta Road

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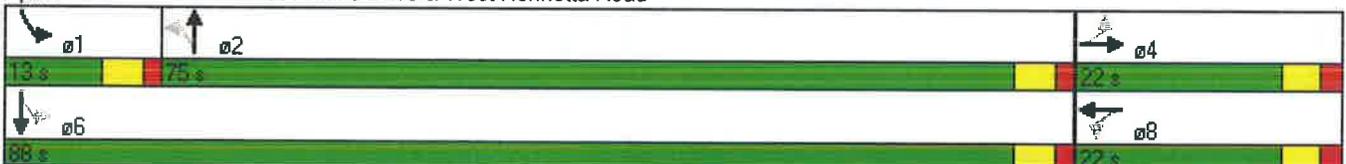
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕	↕	↕	↕	↕
Volume (vph)	9	1	25	1	6	1634	24	1326
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	75.0	75.0	13.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	68.2%	68.2%	11.8%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		10.7		10.7	86.7	86.7	93.3	93.3
Actuated g/C Ratio		0.10		0.10	0.79	0.79	0.85	0.85
v/c Ratio		0.23		0.59	0.03	0.66	0.11	0.50
Control Delay		27.6		21.3	4.7	8.6	3.4	6.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.4
Total Delay		27.6		21.3	4.7	8.6	3.4	6.8
LOS		C		C	A	A	A	A
Approach Delay		27.6		21.3		8.6		6.7
Approach LOS		C		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 62 (56%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 8.5
 Intersection Capacity Utilization 62.1%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 501: Southland Drive & West Henrietta Road



Timings
502: Doncaster Road & West Henrietta Road

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕↔		↕↔
Volume (vph)	3	1	14	1	6	1638	12	1342
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)		7.0		7.0		101.6		101.6
Actuated g/C Ratio		0.06		0.06		0.92		0.92
v/c Ratio		0.07		0.30		0.59		0.50
Control Delay		39.5		38.9		4.6		1.7
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		39.5		38.9		4.6		1.7
LOS		D		D		A		A
Approach Delay		39.5		38.9		4.6		1.7
Approach LOS		D		D		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 71 (65%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 3.7
 Intersection Capacity Utilization 59.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 502: Doncaster Road & West Henrietta Road

 ø2 85 s	 ø4 25 s
 ø6 85 s	 ø8 25 s

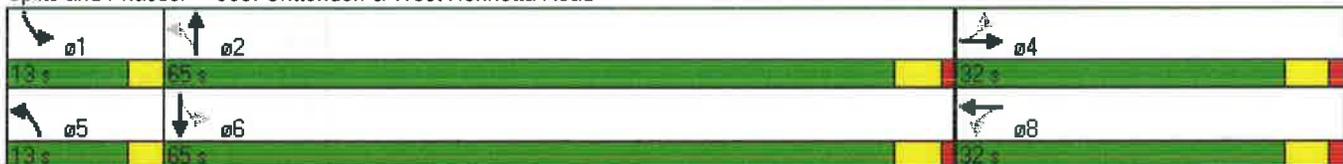


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔↔		↔↔	↗	↕↕	↖	↕↕
Volume (vph)	23	64	258	169	88	1389	198	1335
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	9.0	25.0	8.0	25.0
Total Split (s)	32.0	32.0	32.0	32.0	13.0	65.0	13.0	65.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	11.8%	59.1%	11.8%	59.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	0.0	1.0	0.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	0.0	-2.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		29.0		29.0	69.8	62.0	73.9	64.2
Actuated g/C Ratio		0.26		0.26	0.63	0.56	0.67	0.58
v/c Ratio		0.21		0.97	0.50	0.91	0.96	0.78
Control Delay		22.6		63.2	14.9	40.6	69.7	25.8
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		22.6		63.2	14.9	40.6	69.7	25.8
LOS		C		E	B	D	E	C
Approach Delay		22.6		63.2		39.2		31.1
Approach LOS		C		E		D		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 39.3
 Intersection Capacity Utilization 89.3%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 503: Crittenden & West Henrietta Road



Timings
504: BHTL & West Henrietta Road

7/11/2013
University of Rochester, IPD

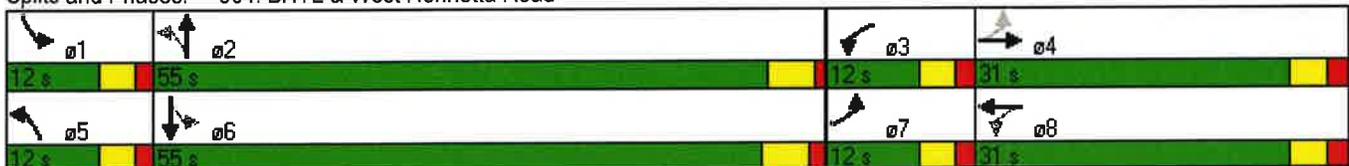


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	170	272	326	315	39	1351	140	1412
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	12.0	31.0	12.0	31.0	12.0	55.0	12.0	55.0
Total Split (%)	10.9%	28.2%	10.9%	28.2%	10.9%	50.0%	10.9%	50.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	31.9	22.9	31.9	22.9	63.6	55.6	68.4	62.1
Actuated g/C Ratio	0.29	0.21	0.29	0.21	0.58	0.51	0.62	0.56
v/c Ratio	0.88	0.50	1.28	0.71	0.22	0.97	0.66	0.89
Control Delay	68.1	37.8	182.4	37.9	11.8	43.5	28.1	27.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	37.8	182.4	37.9	11.8	43.5	28.1	27.0
LOS	E	D	F	D	B	D	C	C
Approach Delay		48.1		95.2		42.7		27.1
Approach LOS		D		F		D		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 49 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.28
 Intersection Signal Delay: 46.8
 Intersection Capacity Utilization 92.1%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 504: BHTL & West Henrietta Road



HCM Unsignalized Intersection Capacity Analysis
 505: Crittenden & East River Road

7/11/2013
 University of Rochester, IPD



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	102	11	204	34	12	312
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	113	12	227	38	13	347
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	619	246			264	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	619	246			264	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	98			99	
cM capacity (veh/h)	447	793			1300	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	126	264	360
Volume Left	113	0	13
Volume Right	12	38	0
cSH	467	1700	1300
Volume to Capacity	0.27	0.16	0.01
Queue Length 95th (ft)	27	0	1
Control Delay (s)	15.5	0.0	0.4
Lane LOS	C		A
Approach Delay (s)	15.5	0.0	0.4
Approach LOS	C		

Intersection Summary			
Average Delay		2.8	
Intersection Capacity Utilization		39.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
506: East River Road &

7/11/2013
University of Rochester, IPD



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	↑
Volume (veh/h)	777	54	64	553	222	103
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	863	60	71	614	247	114
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	615		1295			
pX, platoon unblocked						
vC, conflicting volume			923		1343	462
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			923		1343	462
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		0	79
cM capacity (veh/h)			736		129	547

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	576	348	276	410	247	114
Volume Left	0	0	71	0	247	0
Volume Right	0	60	0	0	0	114
cSH	1700	1700	736	1700	129	547
Volume to Capacity	0.34	0.20	0.10	0.24	1.91	0.21
Queue Length 95th (ft)	0	0	8	0	486	20
Control Delay (s)	0.0	0.0	3.5	0.0	492.5	13.3
Lane LOS			A		F	B
Approach Delay (s)	0.0		1.4		340.7	
Approach LOS					F	

Intersection Summary						
Average Delay			62.9			
Intersection Capacity Utilization			62.6%		ICU Level of Service	B
Analysis Period (min)			15			

Intersection								
Intersection Delay (sec/veh)	8.5							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		1		2	
Conflicting Circle Lanes	2		2		2		2	
Adjusted Approach Flow (vph)	277		585		104		886	
Demand Flow Rate (pc/h)	282		597		105		904	
Vehicles Circulating (pc/h)	733		142		885		174	
Vehicles Exiting (pc/h)	345		848		130		126	
Follow-Up Headway (s)	3.186		3.186		3.186		3.186	
Ped Vol. Crossing Leg (#/hr)	0		0		0		0	
Ped Capacity Adjustment	1.000		1.000		1.000		1.000	
Approach Delay (sec/veh)	8.1		1.3		8.1		13.4	
Approach LOS	A		A		A		B	
Lane	Left	Right	Left	Bypass	Left	Left	Right	
Designated moves	LT	TR	LT	R	LTR	LT	R	
Assumed Moves	LT	TR	LT	R	LTR	LT	R	
Right Turn Channelized	Free							
Lane Utilization	0.472	0.528	1.000		1.000	0.775	0.225	
Critical Headway (s)	4.293	4.113	4.293		4.113	4.293	4.113	
Entry Flow Rate (pc/h)	133	149	158	439	105	701	203	
Capacity, Entry Lane (pc/h)	652	676	1016	1938	608	992	1000	
Entry HV Adjustment Factor	0.978	0.985	0.978	0.980	0.987	0.981	0.980	
Flow Rate, Entry (vph)	130	147	155	430	104	687	199	
Capacity, Entry (vph)	638	666	993	1900	600	972	981	
Volume to Capacity Ratio	0.204	0.220	0.156	0.226	0.173	0.707	0.203	
Control Delay (sec/veh)	8.1	8.0	5.1	0.0	8.1	15.6	5.6	
Level of Service	A	A	A	A	A	C	A	
95th-Percentile Queue (veh)	1	1	1	1	1	6	1	

AM Peak Hour

Background Conditions 20-Year

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HCM Unsignalized Intersection Capacity Analysis University of Rochester, October 2011 Revision
 1: East River Road & Kendrick 7/11/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized						Yes						
Volume (veh/h)	213	136	35	40	270	1123	10	44	49	228	14	87
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	237	151	39	44	300	1248	11	49	54	253	16	97
Approach Volume (veh/h)		427			344			114			366	
Crossing Volume (veh/h)		313			297			641			356	
High Capacity (veh/h)		1083			1097			833			1047	
High v/c (veh/h)		0.39			0.31			0.14			0.35	
Low Capacity (veh/h)		888			901			666			856	
Low v/c (veh/h)		0.48			0.38			0.17			0.43	
Intersection Summary												
Maximum v/c High			0.39									
Maximum v/c Low			0.48									
Intersection Capacity Utilization			86.1%			ICU Level of Service					E	

Timings
2: East River Road & I-390 S On Ramp



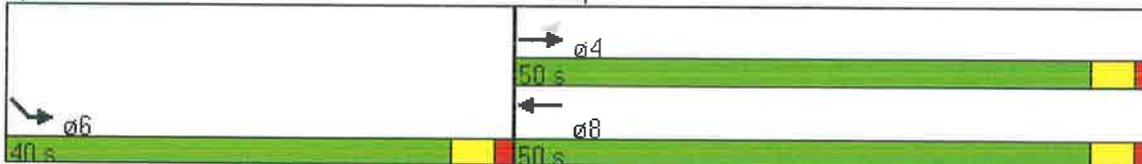
Lane Group	EBL	EBT	WBT	SEL	SER
Lane Configurations					
Volume (vph)	137	276	854	1293	506
Turn Type	Perm				Free
Protected Phases		4	8	6	
Permitted Phases	4				Free
Detector Phase	4	4	8	6	
Switch Phase					
Minimum Initial (s)	3.0	3.0	3.0	3.0	
Minimum Split (s)	25.0	25.0	25.0	25.0	
Total Split (s)	50.0	50.0	50.0	40.0	0.0
Total Split (%)	55.6%	55.6%	55.6%	44.4%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	3.0	3.0	3.0	2.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Min	
Act Effect Green (s)	45.0	47.0	47.0	37.0	90.0
Actuated g/C Ratio	0.50	0.52	0.52	0.41	1.00
v/c Ratio	1.01	0.17	0.60	1.02	0.36
Control Delay	105.1	11.5	16.8	56.3	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	105.1	11.5	16.8	56.3	0.6
LOS	F	B	B	E	A
Approach Delay		42.5	16.8	40.6	
Approach LOS		D	B	D	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2: and 6:SEL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 33.5
 Intersection Capacity Utilization 82.3%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 2: East River Road & I-390 S On Ramp



Timings
3: College Town & Mt. Hope

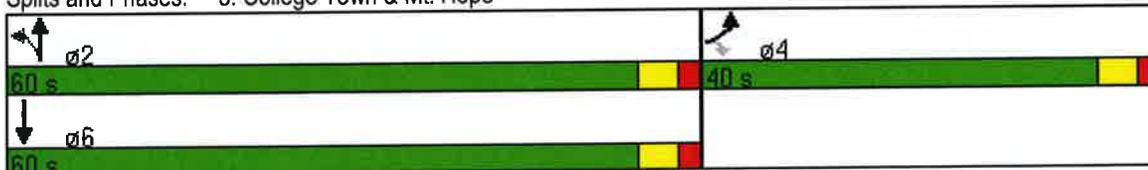


Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	15	41	18	1175	1467
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.5	25.5	25.0
Total Split (s)	40.0	40.0	60.0	60.0	60.0
Total Split (%)	40.0%	40.0%	60.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	7.4	7.4	84.9	84.9	84.9
Actuated g/C Ratio	0.07	0.07	0.85	0.85	0.85
v/c Ratio	0.12	0.33	0.09	0.42	0.53
Control Delay	44.1	34.7	3.2	3.0	3.7
Queue Delay	0.0	0.0	0.0	0.3	0.4
Total Delay	44.1	34.7	3.2	3.2	4.1
LOS	D	C	A	A	A
Approach Delay	37.1			3.2	4.1
Approach LOS	D			A	A

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 5 (5%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 4.4
 Intersection Capacity Utilization 53.3%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: College Town & Mt. Hope





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↑↑↑	↑↑	↗
Volume (veh/h)	0	0	0	1901	925	200
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	2066	1005	217
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				267	774	
pX, platoon unblocked	0.89	0.84	0.84			
vC, conflicting volume	1694	503	1223			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	394	25	883			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	518	877	639			
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	689	689	689	503	503	217
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	217
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.41	0.41	0.41	0.30	0.30	0.13
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	40.1%			ICU Level of Service	A	
Analysis Period (min)	15					

Timings
6: East River Road & West Henrietta Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Configurations									
Volume (vph)	545	73	847	119	774	166	1109	77	803
Turn Type	Split		Perm	Split		pm+pt		Perm	
Protected Phases	4	4		8	8	5	2		6
Permitted Phases			4			2		2	
Detector Phase	4	4	4	8	8	5	2	2	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	33.0	33.0	33.0	35.0	35.0	9.0	47.0	47.0	38.0
Total Split (%)	28.7%	28.7%	28.7%	30.4%	30.4%	7.8%	40.9%	40.9%	33.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.5
Total Lost Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	1.5
Lead/Lag						Lead			Lag
Lead-Lag Optimize?						Yes			Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min
Act Effect Green (s)	31.1	31.1	31.1	33.0	33.0	44.9	44.9	43.9	36.4
Actuated g/C Ratio	0.27	0.27	0.27	0.29	0.29	0.39	0.39	0.38	0.32
v/c Ratio	0.93	0.73	0.72	0.26	1.13	1.06	0.62	0.14	0.93
Control Delay	70.9	24.0	16.5	33.3	110.4	115.5	29.9	12.2	37.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	24.0	16.5	33.3	110.4	115.5	29.9	12.2	37.7
LOS	E	C	B	C	F	F	C	B	D
Approach Delay		33.5			102.4		39.4		37.7
Approach LOS		C			F		D		D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.13
 Intersection Signal Delay: 52.0
 Intersection LOS: D
 Intersection Capacity Utilization 100.4%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 6: East River Road & West Henrietta Road



Timings
8: I-390 SB Ramp & E Henrietta

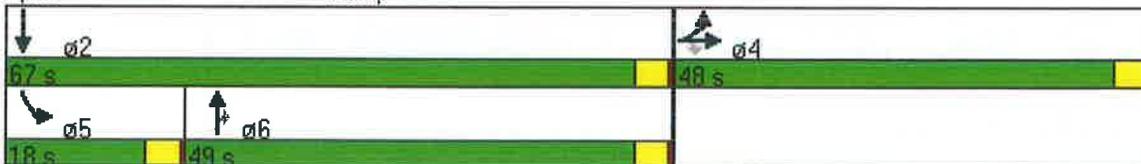


Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Volume (vph)	574	98	1054	1050	260	323	1705
Turn Type	Split		Perm		Perm	Prot	
Protected Phases	4	4		6		5	2
Permitted Phases			4		6		
Detector Phase	4	4	4	6	6	5	2
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	48.0	48.0	48.0	49.0	49.0	18.0	67.0
Total Split (%)	41.7%	41.7%	41.7%	42.6%	42.6%	15.7%	58.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	1.5	1.5	1.5	3.0	3.0	3.0	3.0
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	46.5	46.5	46.5	46.2	46.2	14.8	64.0
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40	0.13	0.56
v/c Ratio	0.72	0.99dr	0.99	0.82	0.38	0.81	0.96
Control Delay	36.5	34.1	70.1	36.7	7.7	41.9	44.6
Queue Delay	0.0	0.0	0.0	8.2	0.0	0.0	0.0
Total Delay	36.5	34.1	70.1	44.9	7.7	41.9	44.6
LOS	D	C	E	D	A	D	D
Approach Delay		45.7		37.5			44.2
Approach LOS		D		D			D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.99
 Intersection Signal Delay: 42.9
 Intersection Capacity Utilization 97.3%
 Analysis Period (min) 15
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: I-390 SB Ramp & E Henrietta



Timings
10: Westfall & E Henrietta

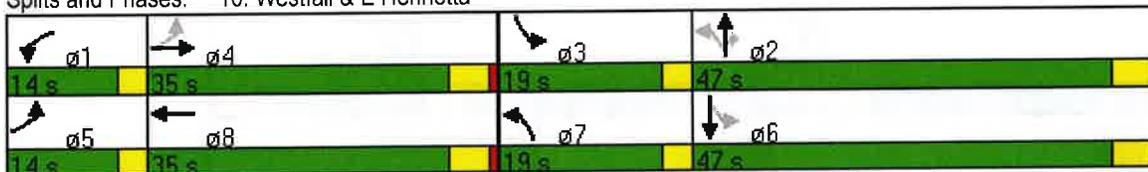


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗	↗	↖	↗
Volume (vph)	105	376	261	354	272	1268	547	229	1090
Turn Type	pm+pt		Prot		pm+pt		Perm	pm+pt	
Protected Phases	5	4	1	8	7	2		3	6
Permitted Phases	4				2		2	6	
Detector Phase	5	4	1	8	7	2	2	3	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	7.0	7.0	5.0	7.0
Minimum Split (s)	10.0	29.0	10.0	29.0	10.0	32.0	32.0	8.0	32.0
Total Split (s)	14.0	35.0	14.0	35.0	19.0	47.0	47.0	19.0	47.0
Total Split (%)	12.2%	30.4%	12.2%	30.4%	16.5%	40.9%	40.9%	16.5%	40.9%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0	-2.0	-1.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	35.6	26.3	11.0	28.0	67.5	50.9	49.9	62.9	48.0
Actuated g/C Ratio	0.31	0.23	0.10	0.24	0.59	0.44	0.43	0.55	0.42
v/c Ratio	0.55	0.65	0.88	0.72	0.89	0.90	0.69	0.86	0.93
Control Delay	32.8	41.7	79.3	36.0	56.4	35.7	16.2	45.8	45.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	20.8	1.5	0.0	0.0
Total Delay	32.8	41.7	79.3	36.0	56.4	56.4	17.7	45.8	45.8
LOS	C	D	E	D	E	E	B	D	D
Approach Delay		40.0		49.3		46.3			45.8
Approach LOS		D		D		D			D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 45.9
 Intersection LOS: D
 Intersection Capacity Utilization 85.7%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 10: Westfall & E Henrietta

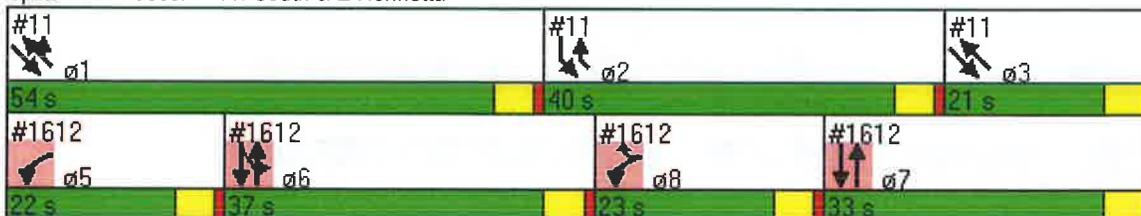


Lane Group	SBL	SET	NWT	NWR	ø1	ø3	ø5	ø6	ø7	ø8
Lane Configurations										
Volume (vph)	699	557	631	824						
Turn Type				custom						
Protected Phases	2	13	13	12	1	3	5	6	7	8
Permitted Phases		13		12						
Detector Phase	2	13	13	12						
Switch Phase										
Minimum Initial (s)	10.0				24.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	21.0	33.0	33.0	13.0
Total Split (s)	40.0	75.0	75.0	94.0	54.0	21.0	22.0	37.0	33.0	23.0
Total Split (%)	34.8%	65.2%	65.2%	81.7%	47%	18%	19%	32%	29%	20%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0						
Total Lost Time (s)	3.0	3.0	3.0	3.0						
Lead/Lag	Lag				Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None				C-Max	None	C-Max	None	None	None
Act Effct Green (s)	35.2	73.8	73.8	89.6						
Actuated g/C Ratio	0.31	0.64	0.64	0.78						
v/c Ratio	0.74	0.29	0.59	0.64						
Control Delay	42.5	3.4	11.6	6.1						
Queue Delay	3.0	0.0	0.1	0.9						
Total Delay	45.5	3.4	11.7	6.9						
LOS	D	A	B	A						
Approach Delay	45.5	3.4	9.0							
Approach LOS	D	A	A							

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NWSE and 5:, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 17.3
 Intersection Capacity Utilization 59.8%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 11: South & E Henrietta



Timings
12: Crittenden Blvd & Mt. Hope

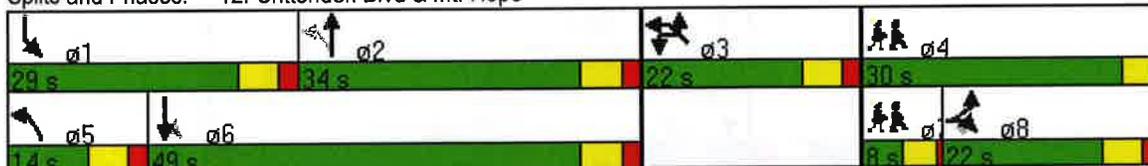


Lane Group	EBL	EBR	EBR2	NBL	NBT	SBL	SBT	NWL	NWR	ø4	ø7
Lane Configurations											
Volume (vph)	116	207	153	212	611	396	951	225	433		
Turn Type		Prot	Perm	pm+pt		pm+pt			Prot		
Protected Phases	8	8		5	2	1	6	3	3	4	7
Permitted Phases			8	2		6					
Detector Phase	8	8	8	5	2	1	6	3	3		
Switch Phase											
Minimum Initial (s)	13.0	13.0	13.0	5.0	7.0	5.0	7.0	6.0	6.0	4.0	4.0
Minimum Split (s)	19.0	19.0	19.0	12.0	27.0	12.0	27.0	18.0	18.0	25.0	8.0
Total Split (s)	22.0	22.0	22.0	14.0	34.0	29.0	49.0	22.0	22.0	30.0	8.0
Total Split (%)	19.1%	19.1%	19.1%	12.2%	29.6%	25.2%	42.6%	19.1%	19.1%	26%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.5	0.5
Lost Time Adjust (s)	-3.0	-3.0	-1.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes								Yes
Recall Mode	None	None	None	None	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	24.7	24.7	22.7	46.6	33.3	62.3	46.0	19.0	19.0		
Actuated g/C Ratio	0.21	0.21	0.20	0.41	0.29	0.54	0.40	0.17	0.17		
v/c Ratio	0.34	0.67	0.54	0.87	0.68	0.88	0.96	0.86	0.74		
Control Delay	47.2	59.1	55.4	52.9	40.0	45.3	50.9	76.4	20.9		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	20.5	0.0	0.0		
Total Delay	47.2	59.1	55.4	52.9	40.0	45.3	71.4	76.4	20.9		
LOS	D	E	E	D	D	D	E	E	C		
Approach Delay	55.0				43.3		64.9	39.9			
Approach LOS	E				D		E	D			

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 53.9
 Intersection Capacity Utilization 82.3%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 12: Crittenden Blvd & Mt. Hope



Timings
13: Elmwood Ave & Mt. Hope

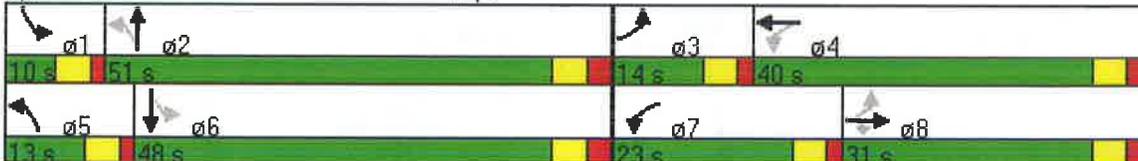


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↙	↕	↘	↙	↕	↙	↕	↙	↕
Volume (vph)	234	693	207	392	1065	214	818	45	873
Turn Type	pm+pt		Perm	pm+pt		pm+pt		pm+pt	
Protected Phases	3	8		7	4	5	2	1	6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	7	4	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	4.0	7.0	4.0	7.0
Minimum Split (s)	12.0	31.0	31.0	12.0	31.0	10.0	33.0	10.0	33.0
Total Split (s)	14.0	31.0	31.0	23.0	40.0	13.0	51.0	10.0	48.0
Total Split (%)	12.2%	27.0%	27.0%	20.0%	34.8%	11.3%	44.3%	8.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-1.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	39.0	28.0	26.0	51.0	37.0	58.0	50.0	51.9	45.0
Actuated g/C Ratio	0.34	0.24	0.23	0.44	0.32	0.50	0.43	0.45	0.39
v/c Ratio	1.10	0.89	0.50	1.16	1.06	1.08	0.72	0.26	1.06
Control Delay	126.6	35.2	12.1	118.8	51.0	112.5	29.9	18.1	75.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0
Total Delay	126.6	35.2	12.1	118.8	51.0	112.5	30.7	18.1	75.6
LOS	F	D	B	F	D	F	C	B	E
Approach Delay		49.9			69.0		45.4		73.7
Approach LOS		D			E		D		E

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 60.6
 Intersection Capacity Utilization 106.3%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service G

Splits and Phases: 13: Elmwood Ave & Mt. Hope



Timings
14: Lattimore & Mt. Hope



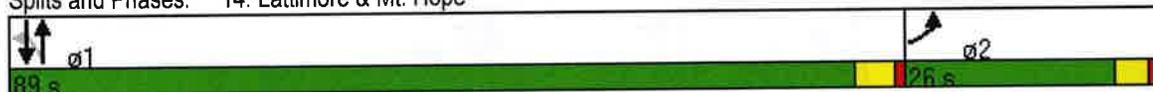
Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	11	146	847	994
Turn Type		Perm		
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	26.0	24.0	24.0	24.0
Total Split (s)	26.0	89.0	89.0	89.0
Total Split (%)	22.6%	77.4%	77.4%	77.4%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	C-Max	C-Max	C-Max
Act Effect Green (s)	9.2		99.8	99.8
Actuated g/C Ratio	0.08		0.87	0.87
v/c Ratio	0.29		0.60	0.40
Control Delay	25.7		9.6	1.3
Queue Delay	0.0		0.0	0.0
Total Delay	25.7		9.6	1.3
LOS	C		A	A
Approach Delay	25.7		9.6	1.3
Approach LOS	C		A	A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 5.7
 Intersection Capacity Utilization 72.9%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 14: Lattimore & Mt. Hope



Timings
15: Westfall & Mt. Hope



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↗	↖	↗	↖	↕	↗	↖	↕
Volume (vph)	11	152	76	220	277	121	893	505	126	829
Turn Type	Perm	custom		pm+pt	custom		Perm	custom		
Protected Phases		4	4	3	3 4	2	1		2	1
Permitted Phases	4		4	3 4		2		1	2	
Detector Phase	4	4	4	3	3 4	2	1	1	2	1
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	5.0		5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	29.0	29.0	29.0	11.0		13.0	40.0	40.0	13.0	40.0
Total Split (s)	29.0	29.0	29.0	18.0	47.0	17.0	51.0	51.0	17.0	51.0
Total Split (%)	25.2%	25.2%	25.2%	15.7%	40.9%	14.8%	44.3%	44.3%	14.8%	44.3%
Yellow Time (s)	4.0	4.0	4.0	3.0		3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	1.0	2.0		2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	None	None	None		None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		21.0	21.0	36.9	39.9	13.1	53.0	52.0	13.1	53.0
Actuated g/C Ratio		0.18	0.18	0.32	0.35	0.11	0.46	0.45	0.11	0.46
v/c Ratio		0.56	0.25	0.63	0.68	0.67	0.61	0.64	0.70	0.57
Control Delay		48.6	17.4	40.5	41.4	55.2	18.4	8.6	73.8	46.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		48.6	17.4	40.5	41.4	55.2	18.4	8.6	73.8	46.7
LOS		D	B	D	D	E	B	A	E	D
Approach Delay		38.7			41.1		18.1			50.2
Approach LOS		D			D		B			D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 33.1
 Intersection Capacity Utilization 74.9%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 15: Westfall & Mt. Hope

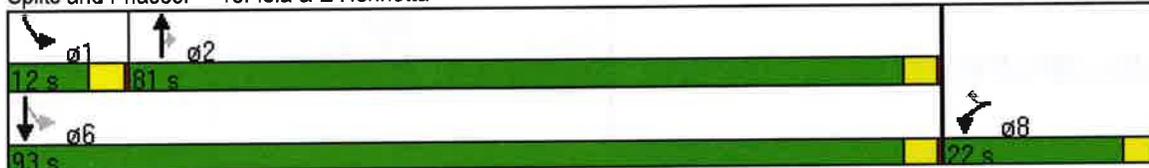


	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↖	↑↑	↗	↘	↑↑
Volume (vph)	114	30	2158	226	107	1270
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	22.0	22.0	81.0	81.0	12.0	93.0
Total Split (%)	19.1%	19.1%	70.4%	70.4%	10.4%	80.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	13.2	13.2	81.9	81.9	93.8	93.8
Actuated g/C Ratio	0.11	0.11	0.71	0.71	0.82	0.82
v/c Ratio	0.61	0.16	0.93	0.21	0.62	0.48
Control Delay	60.6	15.8	13.8	0.4	40.6	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	60.6	15.8	13.8	0.4	40.6	3.6
LOS	E	B	B	A	D	A
Approach Delay	51.2		12.6			6.4
Approach LOS	D		B			A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 11.8
 Intersection LOS: B
 Intersection Capacity Utilization 81.9%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 18: Iola & E Henrietta



Timings
21: Crittenden Blvd & Kendrick

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	48	31	64	162	29	293	100	199	1051	113
Turn Type	Perm			Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases		4	8		1	6		5	2	
Permitted Phases	4			8	6		6	2	2	2
Detector Phase	4	4	8	8	1	6	6	5	2	2
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	8.0	62.0	62.0	13.0	67.0	67.0
Total Split (%)	17.4%	17.4%	17.4%	17.4%	7.0%	53.9%	53.9%	11.3%	58.3%	58.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	14.9	14.9	13.4	13.4	69.6	64.6	64.6	77.6	72.5	72.5
Actuated g/C Ratio	0.13	0.13	0.12	0.12	0.61	0.56	0.56	0.67	0.63	0.63
v/c Ratio	0.71	0.19	0.66	0.52	0.22	0.31	0.12	0.33	0.99	0.12
Control Delay	92.3	36.8	64.4	14.9	12.7	16.5	3.1	2.5	23.2	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.0	0.0
Total Delay	92.3	36.8	64.4	14.9	12.7	16.5	3.1	2.5	61.2	1.7
LOS	F	D	E	B	B	B	A	A	E	A
Approach Delay		66.5	36.5			13.0			47.7	
Approach LOS		E	D			B			D	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.99
 Intersection Signal Delay: 40.2
 Intersection Capacity Utilization 82.1%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings
22: ELMWOOD AVENUE & Kendrick



Lane Group	EBT	WBL	WBT	NBL
Lane Configurations	↑↑	↖	↑↑	↗↘
Volume (vph)	748	617	509	269
Turn Type		pm+pt		
Protected Phases	1	3	1 3	2
Permitted Phases		1 3		
Detector Phase	1	3	1 3	2
Switch Phase				
Minimum Initial (s)	15.0	4.0		10.0
Minimum Split (s)	34.0	10.0		26.0
Total Split (s)	50.0	39.0	89.0	26.0
Total Split (%)	43.5%	33.9%	77.4%	22.6%
Yellow Time (s)	4.0	3.5		4.0
All-Red Time (s)	1.0	1.5		1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lead			Lag
Lead-Lag Optimize?				
Recall Mode	C-Max	None		None
Act Effct Green (s)	47.0	84.7	87.7	21.3
Actuated g/C Ratio	0.41	0.74	0.76	0.19
v/c Ratio	1.11	1.06	0.21	0.75
Control Delay	88.2	74.1	3.8	34.8
Queue Delay	97.9	18.2	0.0	0.0
Total Delay	186.0	92.3	3.8	34.8
LOS	F	F	A	C
Approach Delay	186.0		52.3	34.8
Approach LOS	F		D	C

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 113.4
 Intersection LOS: F
 Intersection Capacity Utilization 103.9%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 22: ELMWOOD AVENUE & Kendrick





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	59	33	522	171	89	590
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	64	36	567	186	97	641
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						1083
pX, platoon unblocked						
vC, conflicting volume	1495	660			753	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1495	660			753	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	47	92			89	
cM capacity (veh/h)	120	463			857	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	64	36	753	97	641	
Volume Left	64	0	0	97	0	
Volume Right	0	36	186	0	0	
cSH	120	463	1700	857	1700	
Volume to Capacity	0.53	0.08	0.44	0.11	0.38	
Queue Length 95th (ft)	63	6	0	10	0	
Control Delay (s)	65.1	13.4	0.0	9.7	0.0	
Lane LOS	F	B		A		
Approach Delay (s)	46.5		0.0	1.3		
Approach LOS	E					
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			56.1%	ICU Level of Service		B
Analysis Period (min)			15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	2	37	506	569	510	139
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	41	562	632	567	154
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2401	644	721			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2401	644	721			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	91	36			
cM capacity (veh/h)	13	473	881			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	43	562	632	721		
Volume Left	2	562	0	0		
Volume Right	41	0	0	154		
cSH	170	881	1700	1700		
Volume to Capacity	0.25	0.64	0.37	0.42		
Queue Length 95th (ft)	24	118	0	0		
Control Delay (s)	33.2	16.0	0.0	0.0		
Lane LOS	D	C				
Approach Delay (s)	33.2	7.5		0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			5.3			
Intersection Capacity Utilization			76.7%		ICU Level of Service	D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis University of Rochester, October 2011 Revision
 27: Westmoreland & Kendrick 7/9/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL2	NEL	NER
Lane Configurations												
Volume (veh/h)	1	1	11	24	1	150	92	326	1	261	925	43
Sign Control		Stop			Stop		Free				Free	
Grade		0%			0%		0%				0%	
Peak Hour Factor	0.90	0.90	0.90	0.92	0.90	0.92	0.92	0.92	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	1	1	12	26	1	163	100	354	1	290	1005	47
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None				None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2327	2187	355	2176	2164	1029	1052			355		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2327	2187	355	2176	2164	1029	1052			355		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	96	98	0	96	43	85			76		
cM capacity (veh/h)	8	29	689	23	30	284	662			1203		
Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2	NE 1						
Volume Total	14	27	163	100	355	1342						
Volume Left	1	26	0	100	0	290						
Volume Right	12	0	163	0	1	47						
cSH	73	23	284	662	1700	1203						
Volume to Capacity	0.20	1.17	0.57	0.15	0.21	0.24						
Queue Length 95th (ft)	17	86	83	13	0	24						
Control Delay (s)	66.1	483.5	33.5	11.4	0.0	6.4						
Lane LOS	F	F	D	B		A						
Approach Delay (s)	66.1	97.8		2.5		6.4						
Approach LOS	F	F										
Intersection Summary												
Average Delay			14.6									
Intersection Capacity Utilization			91.5%		ICU Level of Service					F		
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.



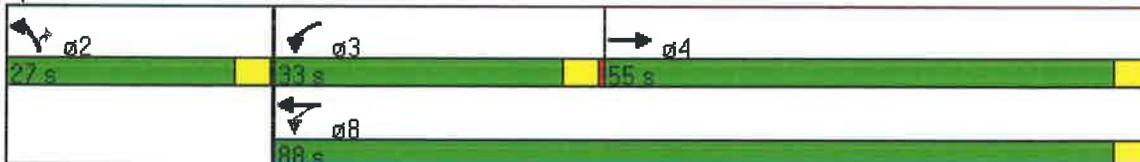
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↘	↑↑	↘	↗
Volume (vph)	885	286	1371	104	191
Turn Type		pm+pt			Perm
Protected Phases	4	3	8	2	
Permitted Phases		8			2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0	20.0
Total Split (s)	55.0	33.0	88.0	27.0	27.0
Total Split (%)	47.8%	28.7%	76.5%	23.5%	23.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	C-Min	C-Min
Act Effct Green (s)	43.9	68.4	68.4	38.6	38.6
Actuated g/C Ratio	0.38	0.59	0.59	0.34	0.34
v/c Ratio	0.80	0.83	0.72	0.20	0.32
Control Delay	29.2	27.0	26.3	32.1	6.2
Queue Delay	9.0	0.0	0.0	0.0	0.0
Total Delay	38.2	27.0	26.3	32.1	6.2
LOS	D	C	C	C	A
Approach Delay	38.2		26.4	15.3	
Approach LOS	D		C	B	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 29.2
 Intersection Capacity Utilization 58.7%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 91: Elmwood Ave & East Dr





Movement	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations			↙	↑	↑	↗
Volume (veh/h)	0	0	94	1229	313	82
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	104	1366	348	91
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1922	348	439			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1922	348	439			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	91			
cM capacity (veh/h)	67	695	1121			
Direction, Lane #	NE 1	NE 2	SW 1	SW 2		
Volume Total	104	1366	348	91		
Volume Left	104	0	0	0		
Volume Right	0	0	0	91		
cSH	1121	1700	1700	1700		
Volume to Capacity	0.09	0.80	0.20	0.05		
Queue Length 95th (ft)	8	0	0	0		
Control Delay (s)	8.5	0.0	0.0	0.0		
Lane LOS	A					
Approach Delay (s)	0.6		0.0			
Approach LOS						
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			68.0%		ICU Level of Service	C
Analysis Period (min)			15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	51	37	399	158	50	937
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.90	0.92	0.92	0.90
Hourly flow rate (vph)	55	40	443	172	54	1041
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						300
pX, platoon unblocked						
vC, conflicting volume	1158	308			615	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1158	308			615	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	94			94	
cM capacity (veh/h)	178	688			961	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	96	296	320	54	521	521
Volume Left	55	0	0	54	0	0
Volume Right	40	0	172	0	0	0
cSH	259	1700	1700	961	1700	1700
Volume to Capacity	0.37	0.17	0.19	0.06	0.31	0.31
Queue Length 95th (ft)	41	0	0	4	0	0
Control Delay (s)	26.8	0.0	0.0	9.0	0.0	0.0
Lane LOS	D			A		
Approach Delay (s)	26.8	0.0		0.4		
Approach LOS	D					

Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			37.7%	ICU Level of Service		A
Analysis Period (min)			15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕		↙	↕	↘↘	
Volume (veh/h)	284	25	297	331	36	74
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	309	27	323	360	39	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	1254			938		
pX, platoon unblocked						
vC, conflicting volume			336		1328	168
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			336		1328	168
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			74		64	91
cM capacity (veh/h)			1220		108	847

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	206	130	323	360	120
Volume Left	0	0	323	0	39
Volume Right	0	27	0	0	80
cSH	1700	1700	1220	1700	261
Volume to Capacity	0.12	0.08	0.26	0.21	0.46
Queue Length 95th (ft)	0	0	27	0	56
Control Delay (s)	0.0	0.0	9.0	0.0	29.9
Lane LOS			A		D
Approach Delay (s)	0.0		4.3		29.9
Approach LOS					D

Intersection Summary					
Average Delay			5.7		
Intersection Capacity Utilization			41.6%	ICU Level of Service	A
Analysis Period (min)			15		

Timings
162: ELMWOOD AVENUE & South



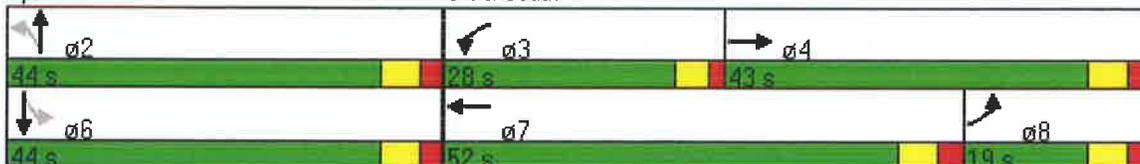
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↵	↵↻	↵	↵↻		↻		↻
Volume (vph)	220	596	228	1360	5	605	55	462
Turn Type	custom		Prot		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	8				2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	19.0	43.0	28.0	52.0	44.0	44.0	44.0	44.0
Total Split (%)	16.5%	37.4%	24.3%	45.2%	38.3%	38.3%	38.3%	38.3%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?								
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	16.0	42.4	22.6	49.0		41.0		41.0
Actuated g/C Ratio	0.14	0.37	0.20	0.43		0.36		0.36
v/c Ratio	0.99	0.54	0.73	1.04		0.72		0.94
Control Delay	68.8	14.3	55.8	68.0		24.9		53.7
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	68.8	14.3	55.8	68.0		24.9		53.7
LOS	E	B	E	E		C		D
Approach Delay		28.5		66.3		24.9		53.7
Approach LOS		C		E		C		D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 48.0
 Intersection Capacity Utilization 107.4%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service G

Splits and Phases: 162: ELMWOOD AVENUE & South



Timings
222: E Henrietta & I-390 NB On Ramp

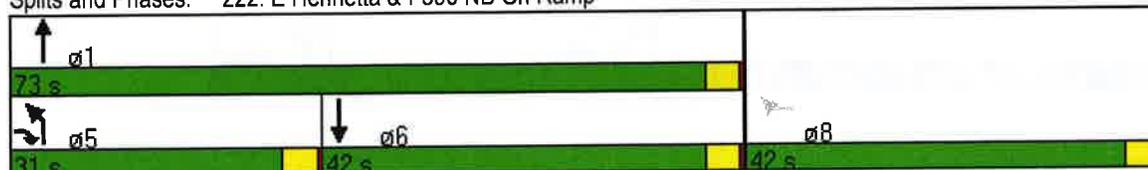


Lane Group	EBR	WBR	NBL	NBT	SBT	SBR2
Lane Configurations	↗	↗↗	↘↘	↑↑	↑↑	↗
Volume (vph)	684	1014	253	1371	1344	92
Turn Type	custom	custom	Prot			Free
Protected Phases	5		5	1	6	
Permitted Phases	5	8				Free
Detector Phase	5	8	5	1	6	
Switch Phase						
Minimum Initial (s)	26.0	4.0	26.0	46.0	4.0	
Minimum Split (s)	30.0	20.0	30.0	50.0	20.0	
Total Split (s)	31.0	42.0	31.0	73.0	42.0	0.0
Total Split (%)	27.0%	36.5%	27.0%	63.5%	36.5%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead		Lead		Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	
Recall Mode	C-Max	None	C-Max	None	None	
Act Effct Green (s)	27.0	38.0	27.0	69.0	38.0	115.0
Actuated g/C Ratio	0.23	0.33	0.23	0.60	0.33	1.00
v/c Ratio	0.95	1.22	0.35	0.72	1.28	0.06
Control Delay	35.5	145.1	52.3	13.9	161.0	0.1
Queue Delay	0.0	0.0	0.0	0.1	1.0	0.0
Total Delay	35.5	145.1	52.3	14.0	162.0	0.1
LOS	D	F	D	B	F	A
Approach Delay				19.9	151.6	
Approach LOS				B	F	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2: and 5:NBL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.28
 Intersection Signal Delay: 88.6
 Intersection LOS: F
 Intersection Capacity Utilization 104.3%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 222: E Henrietta & I-390 NB On Ramp





Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↘	↑↑	↘	↗
Volume (vph)	937	64	1082	43	31
Turn Type		pm+pt			Perm
Protected Phases	1	3	1 3	2	
Permitted Phases		1 3			2
Detector Phase	1	3	1 3	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	71.0	12.0	83.0	32.0	32.0
Total Split (%)	61.7%	10.4%	72.2%	27.8%	27.8%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effct Green (s)	68.0	77.0	80.0	29.0	29.0
Actuated g/C Ratio	0.59	0.67	0.70	0.25	0.25
v/c Ratio	0.52	0.21	0.49	0.11	0.08
Control Delay	17.5	3.3	3.3	34.0	11.3
Queue Delay	1.5	0.0	0.7	0.0	0.0
Total Delay	18.9	3.3	3.9	34.0	11.3
LOS	B	A	A	C	B
Approach Delay	18.9		3.9	24.6	
Approach LOS	B		A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 11.3
 Intersection Capacity Utilization 45.8%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 393: ELMWOOD AVENUE & U of R



Timings
395: Crittenden Blvd & East Dr



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↖	↗	↕	↖	↗
Volume (vph)	84	306	471	84	246
Turn Type	Perm				Perm
Protected Phases		1	1	2	
Permitted Phases	1				2
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	15.0	15.0
Total Split (s)	67.0	67.0	67.0	48.0	48.0
Total Split (%)	58.3%	58.3%	58.3%	41.7%	41.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	93.9	93.9	93.9	15.1	15.1
Actuated g/C Ratio	0.82	0.82	0.82	0.13	0.13
v/c Ratio	0.16	0.12	0.24	0.40	0.61
Control Delay	3.7	2.7	0.9	50.0	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	2.7	0.9	50.0	11.5
LOS	A	A	A	D	B
Approach Delay		2.9	0.9	21.3	
Approach LOS		A	A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 6.5
 Intersection Capacity Utilization 39.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	30	1	63	2	196	1883	43	1306
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	14.0	39.0	14.0	39.0
Total Split (s)	32.0	32.0	32.0	32.0	14.0	69.0	14.0	69.0
Total Split (%)	27.8%	27.8%	27.8%	27.8%	12.2%	60.0%	12.2%	60.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	13.4	13.4	13.4	13.4	92.6	75.1	92.6	75.1
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.81	0.65	0.81	0.65
v/c Ratio	0.51	0.09	0.43	0.63	0.56	0.96	0.14	0.68
Control Delay	72.5	19.2	54.2	24.1	21.5	23.2	13.9	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	30.5	0.0	0.3
Total Delay	72.5	19.2	54.2	24.1	21.5	53.6	13.9	4.1
LOS	E	B	D	C	C	D	B	A
Approach Delay		53.7		32.0		50.7		4.4
Approach LOS		D		C		D		A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 32.5
 Intersection Capacity Utilization 88.1%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 470: MCH & E Henrietta



Timings
500: Crittenden & E Henrietta

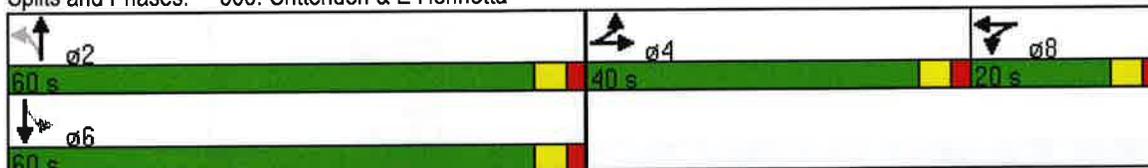


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↗	↖	↗	↖	↗
Volume (vph)	384	10	1	55	926	31	1573
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	40.0	40.0	20.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	16.7%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	28.4	28.4	8.0	81.2	81.2	81.2	81.2
Actuated g/C Ratio	0.24	0.24	0.07	0.68	0.68	0.68	0.68
v/c Ratio	0.72	0.67	0.06	0.95	0.43	0.12	1.31
Control Delay	51.9	43.6	0.4	128.6	11.3	11.9	164.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	20.3
Total Delay	51.9	43.6	0.4	128.6	11.3	11.9	184.4
LOS	D	D	A	F	B	B	F
Approach Delay		47.8	0.4		17.8		182.5
Approach LOS		D	A		B		F

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 105 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.31
 Intersection Signal Delay: 127.8
 Intersection Capacity Utilization 108.1%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service G

Splits and Phases: 500: Crittenden & E Henrietta



Timings
501: Southland Drive & West Henrietta Road



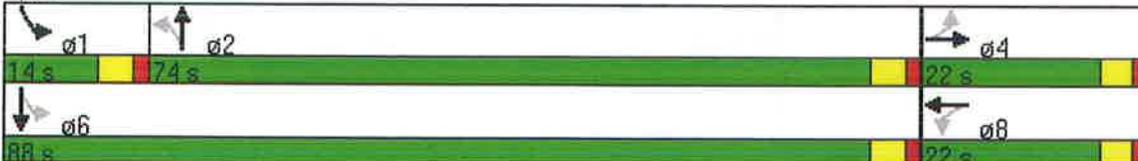
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕	↗	↕	↗	↕
Volume (vph)	41	1	8	1	1	1296	85	1666
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	74.0	74.0	14.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	67.3%	67.3%	12.7%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		11.2		11.2	86.1	86.1	94.9	95.5
Actuated g/C Ratio		0.10		0.10	0.78	0.78	0.86	0.87
v/c Ratio		0.34		0.16	0.01	0.53	0.28	0.61
Control Delay		46.6		26.1	3.0	6.9	3.7	3.9
Queue Delay		0.0		0.0	0.0	0.1	0.0	0.3
Total Delay		46.6		26.1	3.0	6.9	3.7	4.3
LOS		D		C	A	A	A	A
Approach Delay		46.6		26.1		6.9		4.2
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 6.2
 Intersection Capacity Utilization 66.2%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 501: Southland Drive & West Henrietta Road



Timings
502: Doncaster Road & West Henrietta Road



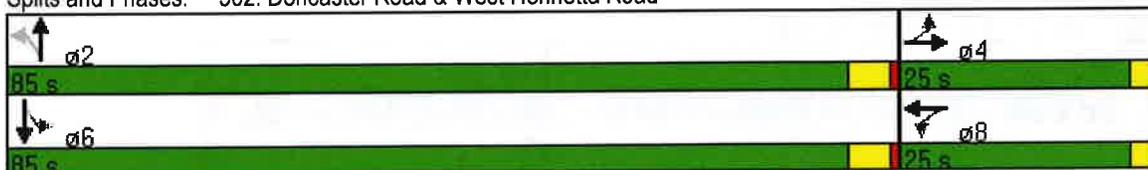
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Volume (vph)	12	1	4	2	1	1304	12	1662
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)		6.6		6.5		104.5		104.5
Actuated g/C Ratio		0.06		0.06		0.95		0.95
v/c Ratio		0.13		0.17		0.45		0.59
Control Delay		48.8		33.2		2.8		2.5
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		48.8		33.2		2.9		2.5
LOS		D		C		A		A
Approach Delay		48.8		33.2		2.9		2.5
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 75 (68%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 3.0
 Intersection Capacity Utilization 64.5%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 502: Doncaster Road & West Henrietta Road



Timings
504: BHTL & West Henrietta Road



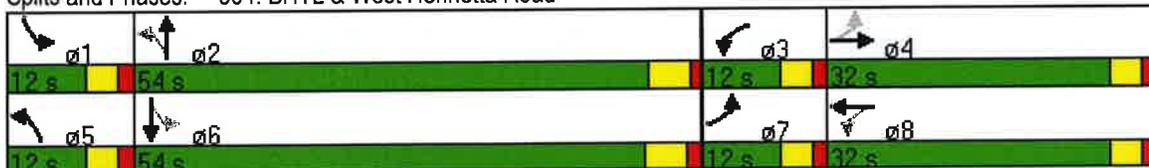
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↶	↷	↶	↷	↶	↷	↶	↷
Volume (vph)	175	394	143	354	42	815	242	1089
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	12.0	32.0	12.0	32.0	12.0	54.0	12.0	54.0
Total Split (%)	10.9%	29.1%	10.9%	29.1%	10.9%	49.1%	10.9%	49.1%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	31.9	22.9	31.9	22.9	59.1	51.0	68.5	60.0
Actuated g/C Ratio	0.29	0.21	0.29	0.21	0.54	0.46	0.62	0.55
v/c Ratio	0.87	0.62	0.65	0.70	0.24	0.71	0.79	0.78
Control Delay	64.4	42.8	40.6	42.3	12.2	25.8	38.4	33.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.4	42.8	40.6	42.3	12.2	25.8	38.4	33.4
LOS	E	D	D	D	B	C	D	C
Approach Delay		49.2		41.9		25.3		34.1
Approach LOS		D		D		C		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 35.2
 Intersection Capacity Utilization 79.3%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 504: BHTL & West Henrietta Road





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	68	10	456	133	2	186
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	76	11	507	148	2	207
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	792	581			654	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	792	581			654	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	98			100	
cM capacity (veh/h)	357	514			933	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	87	654	209
Volume Left	76	0	2
Volume Right	11	148	0
cSH	372	1700	933
Volume to Capacity	0.23	0.38	0.00
Queue Length 95th (ft)	22	0	0
Control Delay (s)	17.6	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	17.6	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		43.1%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	↑
Volume (veh/h)	1431	138	158	904	81	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1590	153	176	1004	90	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	551					
pX, platoon unblocked						
vC, conflicting volume			1743		2520	872
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1743		2520	872
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			51		0	87
cM capacity (veh/h)			356		12	294
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	1060	683	510	670	90	38
Volume Left	0	0	176	0	90	0
Volume Right	0	153	0	0	0	38
cSH	1700	1700	356	1700	12	294
Volume to Capacity	0.62	0.40	0.49	0.39	7.73	0.13
Queue Length 95th (ft)	0	0	65	0	Err	11
Control Delay (s)	0.0	0.0	18.3	0.0	Err	19.0
Lane LOS			C		F	C
Approach Delay (s)	0.0		7.9		7048.4	
Approach LOS					F	
Intersection Summary						
Average Delay			298.2			
Intersection Capacity Utilization			88.0%		ICU Level of Service E	
Analysis Period (min)	15					

Intersection								
Intersection Delay (sec/veh)	3.7							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		1		2	
Conflicting Circle Lanes	2		2		2		2	
Adjusted Approach Flow (vph)	427		1592		114		366	
Demand Flow Rate (pc/h)	436		1624		116		373	
Vehicles Circulating (pc/h)	319		303		654		362	
Vehicles Exiting (pc/h)	416		467		101		292	
Follow-Up Headway (s)	3.186		3.186		3.186		3.186	
Ped Vol. Crossing Leg (#/hr)	0		0		0		0	
Ped Capacity Adjustment	1.000		1.000		1.000		1.000	
Approach Delay (sec/veh)	6.7		1.9		6.9		7.2	
Approach LOS	A		A		A		A	
Lane	Left	Right	Left	Bypass	Left	Left	Right	
Designated moves	LT	TR	LT	R	LTR	LT	R	
Assumed Moves	L	TR	LT	R	LTR	LT	R	
Right Turn Channelized	Free							
Lane Utilization	0.555	0.445	1.000		1.000	0.735	0.265	
Critical Headway (s)	4.293	4.113	4.293		4.113	4.293	4.113	
Entry Flow Rate (pc/h)	242	194	351	1273	116	274	99	
Capacity, Entry Lane (pc/h)	890	904	900	1938	715	861	877	
Entry HV Adjustment Factor	0.979	0.979	0.980	0.980	0.983	0.981	0.980	
Flow Rate, Entry (vph)	237	190	344	1248	114	269	97	
Capacity, Entry (vph)	871	885	882	1900	703	845	859	
Volume to Capacity Ratio	0.272	0.215	0.390	0.657	0.162	0.318	0.113	
Control Delay (sec/veh)	7.0	6.2	8.6	0.0	6.9	7.8	5.3	
Level of Service	A	A	A	A	A	A	A	
95th-Percentile Queue (veh)	1	1	2	5	1	1	0	

PM Peak Hour

Background Conditions 20-Year

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Right Turn Channelized						Yes						
Volume (veh/h)	104	147	32	32	183	348	20	80	121	524	25	165
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	116	163	36	36	203	387	22	89	134	582	28	183
Approach Volume (veh/h)		314			239		246				793	
Crossing Volume (veh/h)		646			227		861				261	
High Capacity (veh/h)		831			1160		697				1128	
High v/c (veh/h)		0.38			0.21		0.35				0.70	
Low Capacity (veh/h)		663			957		547				929	
Low v/c (veh/h)		0.47			0.25		0.45				0.85	
Intersection Summary												
Maximum v/c High			0.70									
Maximum v/c Low			0.85									
Intersection Capacity Utilization			Err%		ICU Level of Service						H	

Timings
2: East River Road & I-390 S On Ramp

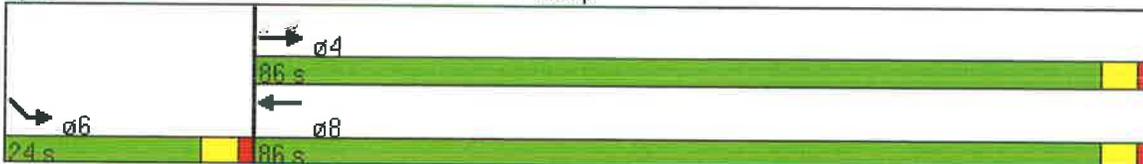


Lane Group	EBL	EBT	WBT	SEL	SER
Lane Configurations	↘	↑↑	↑↑	↘↘	↗
Volume (vph)	455	325	410	685	168
Turn Type	Perm				custom
Protected Phases		4	8	6	
Permitted Phases	4				4
Detector Phase	4	4	8	6	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	10.0	5.0	5.0
Minimum Split (s)	10.0	10.0	20.0	10.0	10.0
Total Split (s)	86.0	86.0	86.0	24.0	86.0
Total Split (%)	78.2%	78.2%	78.2%	21.8%	78.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	-2.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	3.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	None
Act Effect Green (s)	81.0	81.0	81.0	21.0	81.0
Actuated g/C Ratio	0.74	0.74	0.74	0.19	0.74
v/c Ratio	1.42	0.14	0.43	1.16	0.15
Control Delay	225.9	4.4	4.0	129.3	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	225.9	4.4	4.0	129.3	0.9
LOS	F	A	A	F	A
Approach Delay		132.5	4.0	103.9	
Approach LOS		F	A	F	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 53 (48%), Referenced to phase 2: and 6:SEL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.42
 Intersection Signal Delay: 76.4
 Intersection Capacity Utilization 84.2%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service E

Splits and Phases: 2: East River Road & I-390 S On Ramp



Timings
3: College Town & Mt. Hope

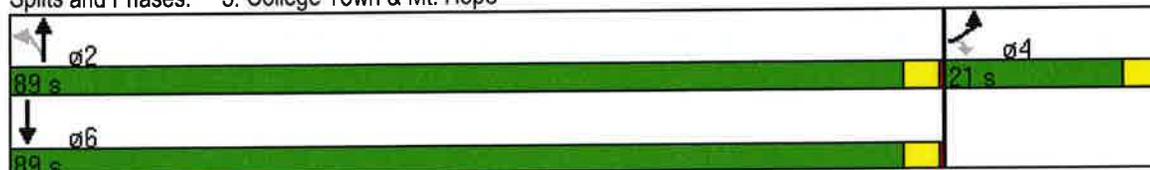


Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations	↖	↗	↖	↑↑	↑↑
Volume (vph)	36	97	84	1632	1531
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	21.0	21.0	89.0	89.0	89.0
Total Split (%)	19.1%	19.1%	80.9%	80.9%	80.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.1	9.1	92.9	92.9	92.9
Actuated g/C Ratio	0.08	0.08	0.84	0.84	0.84
v/c Ratio	0.27	0.56	0.47	0.59	0.57
Control Delay	50.4	34.1	5.1	1.5	1.4
Queue Delay	0.0	0.3	0.0	0.8	0.7
Total Delay	50.4	34.4	5.1	2.3	2.1
LOS	D	C	A	A	A
Approach Delay	38.7			2.4	2.1
Approach LOS	D			A	A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 3.7
 Intersection Capacity Utilization 61.3%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 3: College Town & Mt. Hope





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↑↑↑	↑↑	↗
Volume (veh/h)	0	0	0	2017	1485	771
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	2241	1650	857
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				267	774	
pX, platoon unblocked	0.76	0.65	0.65			
vC, conflicting volume	2397	825	2507			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	525	0	2241			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	364	705	148			
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	747	747	747	825	825	857
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	857
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.44	0.44	0.44	0.49	0.49	0.50
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	51.1%			ICU Level of Service	A	
Analysis Period (min)	15					

Timings
6: East River Road & West Henrietta Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Configurations	↖	↔	↗	↖	↔	↖	↑↑↑	↗	↔
Volume (vph)	297	314	398	173	250	105	1616	361	1084
Turn Type	Split		Perm	Split		pm+pt		Perm	
Protected Phases	4	4		8	8	5	2		6
Permitted Phases			4			2		2	
Detector Phase	4	4	4	8	8	5	2	2	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	21.0	21.0	21.0	20.0	20.0	20.0	69.0	69.0	49.0
Total Split (%)	19.1%	19.1%	19.1%	18.2%	18.2%	18.2%	62.7%	62.7%	44.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.5
Total Lost Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	1.5
Lead/Lag						Lead			Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	Min	C-Min	C-Min	C-Min
Act Effect Green (s)	19.0	19.0	19.0	17.1	17.1	67.9	67.9	66.9	55.6
Actuated g/C Ratio	0.17	0.17	0.17	0.16	0.16	0.62	0.62	0.61	0.51
v/c Ratio	1.03	1.02	0.56	0.70	0.71	0.48	0.57	0.38	0.95
Control Delay	108.0	83.9	10.1	58.2	47.7	27.8	11.2	6.0	30.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	108.0	83.9	10.1	58.2	47.7	27.8	11.4	6.0	30.7
LOS	F	F	B	E	D	C	B	A	C
Approach Delay		72.9			51.2		11.3		30.7
Approach LOS		E			D		B		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 45 (41%), Referenced to phase 2:NBTL and 6:SBT, Start of 1st Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.03
 Intersection Signal Delay: 33.2
 Intersection Capacity Utilization 86.5%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 6: East River Road & West Henrietta Road



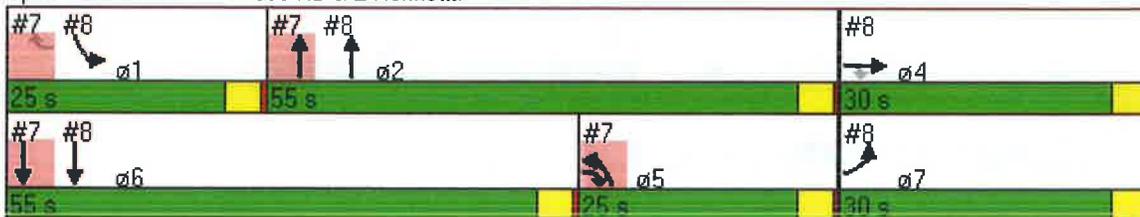


Lane Group	EBR	WBR	NBL	NBT	SBT	SBR	ø4	ø7
Lane Configurations	↖	↖↖	↖↖	↑↑	↑↑	↖		
Volume (vph)	300	460	616	1157	1663	519		
Turn Type	Over	custom	Prot			Free		
Protected Phases	5		5	2	6		4	7
Permitted Phases		1				Free		
Detector Phase	5	1	5	2	6			
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	4.0	4.0		3.0	4.0
Minimum Split (s)	24.0	8.0	24.0	20.0	20.0		24.0	20.0
Total Split (s)	25.0	25.0	25.0	55.0	55.0	0.0	30.0	30.0
Total Split (%)	22.7%	22.7%	22.7%	50.0%	50.0%	0.0%	27%	27%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	-1.0	-1.0	-1.0	-1.0	-1.0		
Total Lost Time (s)	4.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lead	Lag	Lag	Lead			
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	None	None		Max	None
Act Effct Green (s)	21.0	22.0	22.0	52.0	52.0	110.0		
Actuated g/C Ratio	0.19	0.20	0.20	0.47	0.47	1.00		
v/c Ratio	0.53	0.45	1.00	0.77	1.10	0.36		
Control Delay	5.0	1.3	50.2	14.9	84.2	0.4		
Queue Delay	0.0	0.0	0.0	4.0	3.4	0.0		
Total Delay	5.0	1.3	50.2	18.9	87.6	0.4		
LOS	A	A	D	B	F	A		
Approach Delay				29.8	66.9			
Approach LOS				C	E			

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:WBR and 5:NBL, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.10
 Intersection Signal Delay: 42.6
 Intersection Capacity Utilization 71.2%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service C

Splits and Phases: 7: I-390 NB & E Henrietta



Timings
8: I-390 SB Ramp & E Henrietta

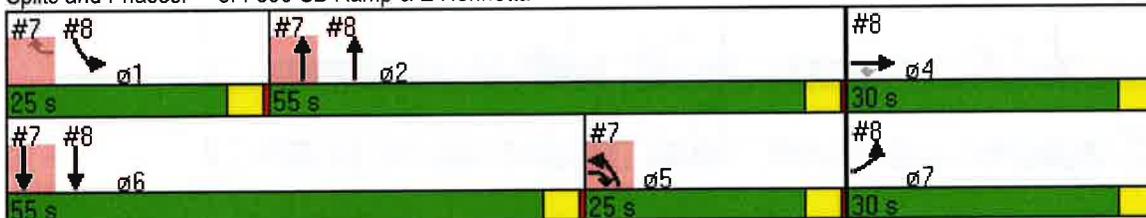


Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	ø5
Lane Configurations	↶	↷	↷	↷	↷	↶	↷	
Volume (vph)	252	502	569	1521	909	526	1437	
Turn Type	Prot		Perm		Free	Prot		
Protected Phases	7	4		2		1	6	5
Permitted Phases			4		Free			
Detector Phase	7	4	4	2		1	6	
Switch Phase								
Minimum Initial (s)	4.0	3.0	3.0	4.0		3.0	4.0	3.0
Minimum Split (s)	20.0	24.0	24.0	20.0		8.0	20.0	24.0
Total Split (s)	30.0	30.0	30.0	55.0	0.0	25.0	55.0	25.0
Total Split (%)	27.3%	27.3%	27.3%	50.0%	0.0%	22.7%	50.0%	23%
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5	0.5	0.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lead/Lag				Lag		Lead	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	Max	Max	None		C-Max	None	C-Max
Act Effct Green (s)	27.0	27.0	27.0	52.0	110.0	22.0	52.0	
Actuated g/C Ratio	0.25	0.25	0.25	0.47	1.00	0.20	0.47	
v/c Ratio	0.64	1.07	0.62	1.01	0.64	0.85	0.95	
Control Delay	45.6	90.2	10.4	54.0	2.0	56.4	15.2	
Queue Delay	0.0	0.0	0.0	2.1	0.0	0.0	27.1	
Total Delay	45.6	90.2	10.4	56.2	2.0	56.4	42.3	
LOS	D	F	B	E	A	E	D	
Approach Delay		62.0		35.9			46.1	
Approach LOS		E		D			D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:WBR and 5:NBL, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.10
 Intersection Signal Delay: 45.4
 Intersection LOS: D
 Intersection Capacity Utilization 85.2%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 8: I-390 SB Ramp & E Henrietta





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↙	↕	↙	↕	↙	↕	↗	↙	↕
Volume (vph)	154	434	469	376	166	1194	274	295	1432
Turn Type	pm+pt		Prot		pm+pt		Perm	pm+pt	
Protected Phases	5	4	1	8	7	2		3	6
Permitted Phases	4				2		2	6	
Detector Phase	5	4	1	8	7	2	2	3	6
Switch Phase									
Minimum Initial (s)	4.0	10.0	10.0	10.0	5.0	7.0	7.0	5.0	7.0
Minimum Split (s)	8.0	32.0	29.0	32.0	10.0	32.0	32.0	10.0	32.0
Total Split (s)	15.0	32.0	29.0	46.0	10.0	38.0	38.0	11.0	39.0
Total Split (%)	13.6%	29.1%	26.4%	41.8%	9.1%	34.5%	34.5%	10.0%	35.5%
Yellow Time (s)	3.5	4.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.5	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0	-2.0	-1.0	0.0	-2.0
Total Lost Time (s)	4.0	3.0	5.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes								
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	36.9	27.6	21.9	40.2	44.4	35.0	34.0	47.9	37.1
Actuated g/C Ratio	0.34	0.25	0.20	0.37	0.40	0.32	0.31	0.44	0.34
v/c Ratio	0.51	0.78	0.76	0.51	0.83	1.18	0.47	1.29	1.43
Control Delay	21.5	42.7	49.4	22.8	55.4	125.0	20.3	176.0	225.8
Queue Delay	0.0	0.0	0.8	0.0	0.0	24.2	0.0	0.0	0.0
Total Delay	21.5	42.7	50.2	22.8	55.4	149.2	20.3	176.0	225.8
LOS	C	D	D	C	E	F	C	F	F
Approach Delay		38.5		34.9		118.1			217.7
Approach LOS		D		C		F			F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 101 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.43
 Intersection Signal Delay: 123.9
 Intersection Capacity Utilization 97.3%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service F

Splits and Phases: 10: Westfall & E Henrietta



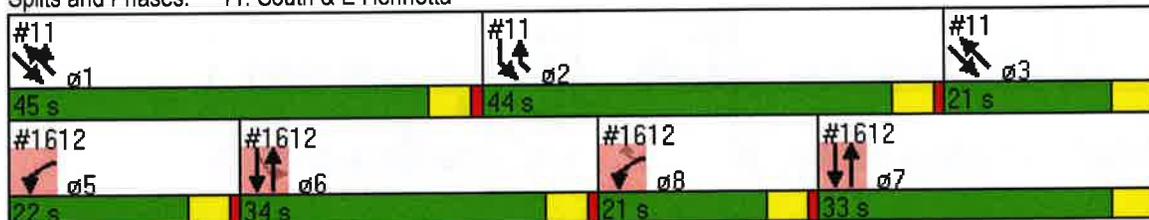
Timings
11: South & E Henrietta

Lane Group	SBL	SET	NWT	NWR	ø1	ø3	ø5	ø6	ø7	ø8
Lane Configurations										
Volume (vph)	945	747	807	739						
Turn Type				custom						
Protected Phases	2	1 3	1 3	1 2	1	3	5	6	7	8
Permitted Phases		1 3		1						
Detector Phase	2	1 3	1 3	1 2						
Switch Phase										
Minimum Initial (s)	10.0				24.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	21.0	33.0	33.0	13.0
Total Split (s)	44.0	66.0	66.0	89.0	45.0	21.0	22.0	34.0	33.0	21.0
Total Split (%)	40.0%	60.0%	60.0%	80.9%	41%	19%	20%	31%	30%	19%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0						
Total Lost Time (s)	3.0	3.0	3.0	3.0						
Lead/Lag	Lag				Lead	Lead	Lag	Lag	Lead	
Lead-Lag Optimize?										
Recall Mode	None				C-Max	None	C-Max	None	None	None
Act Effect Green (s)	40.2	63.8	63.8	85.2						
Actuated g/C Ratio	0.37	0.58	0.58	0.77						
v/c Ratio	0.84	0.44	0.83	0.58						
Control Delay	40.1	3.7	19.7	4.7						
Queue Delay	35.8	0.0	0.0	0.4						
Total Delay	75.9	3.7	19.7	5.1						
LOS	E	A	B	A						
Approach Delay	75.9	3.7	12.7							
Approach LOS	E	A	B							

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1: NWSE and 5:, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 29.1
 Intersection LOS: C
 Intersection Capacity Utilization 76.1%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 11: South & E Henrietta



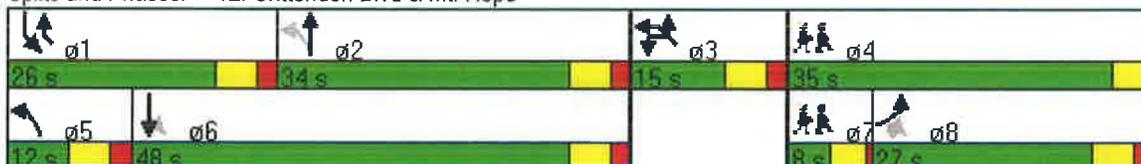


Lane Group	EBL	EBR	EBR2	NBL	NBT	SBL	SBT	NWL	NWR	Ø4	Ø7
Lane Configurations											
Volume (vph)	245	337	255	163	950	463	1097	160	519		
Turn Type		Perm	Perm	pm+pt		pm+pt			pt+ov		
Protected Phases	8			5	2	1	6	3	31	4	7
Permitted Phases		8	8	2		6					
Detector Phase	8	8	8	5	2	1	6	3	31		
Switch Phase											
Minimum Initial (s)	13.0	13.0	13.0	5.0	7.0	5.0	7.0	3.0		4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	12.0	27.0	12.0	27.0	12.0		8.0	8.0
Total Split (s)	27.0	27.0	27.0	12.0	34.0	26.0	48.0	15.0	41.0	35.0	8.0
Total Split (%)	24.5%	24.5%	24.5%	10.9%	30.9%	23.6%	43.6%	13.6%	37.3%	32%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		0.5	0.5
Lost Time Adjust (s)	-3.0	-3.0	-1.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lag				Lead
Lead-Lag Optimize?											Yes
Recall Mode	None	None	None	None	C-Max	None	C-Max	None		None	None
Act Effct Green (s)	32.0	32.0	30.0	40.0	31.0	57.0	45.0	12.0	35.0		
Actuated g/C Ratio	0.29	0.29	0.27	0.36	0.28	0.52	0.41	0.11	0.32		
v/c Ratio	0.53	0.81	0.66	0.85	1.09	1.17	0.90	0.98	0.93		
Control Delay	43.5	58.0	51.6	50.0	95.0	131.7	54.9	97.3	37.2		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0		
Total Delay	43.5	58.0	51.6	50.0	95.0	131.7	55.8	97.3	37.2		
LOS	D	E	D	D	F	F	E	F	D		
Approach Delay	51.8				88.6		77.4	52.0			
Approach LOS	D				F		E	D			

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.17
 Intersection Signal Delay: 71.3
 Intersection Capacity Utilization 89.1%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service E

Splits and Phases: 12: Crittenden Blvd & Mt. Hope



Timings
13: Elmwood Ave & Mt. Hope

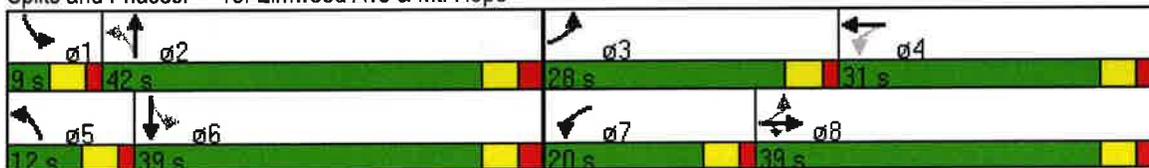


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↙	↑↑	↗	↙	↑↑	↙	↑↑	↙	↑↑
Volume (vph)	494	1103	237	273	685	190	1011	93	1052
Turn Type	pm+pt		Perm	pm+pt		pm+pt		pm+pt	
Protected Phases	3	8		7	4	5	2	1	6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	7	4	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	4.0	7.0	4.0	7.0
Minimum Split (s)	12.0	31.0	31.0	12.0	31.0	10.0	33.0	10.0	33.0
Total Split (s)	28.0	39.0	39.0	20.0	31.0	12.0	42.0	9.0	39.0
Total Split (%)	25.5%	35.5%	35.5%	18.2%	28.2%	10.9%	38.2%	8.2%	35.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-1.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	56.0	36.4	34.4	44.6	28.0	48.0	39.0	42.0	36.0
Actuated g/C Ratio	0.51	0.33	0.31	0.41	0.25	0.44	0.35	0.38	0.33
v/c Ratio	1.16	1.05	0.45	0.90	0.89	0.99	1.32	0.62	1.26
Control Delay	117.0	61.0	8.8	65.5	70.3	90.0	181.3	36.7	158.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0
Total Delay	117.0	61.0	8.8	65.5	70.3	90.0	182.2	36.7	158.4
LOS	F	E	A	E	E	F	F	D	F
Approach Delay		69.3			69.0		171.7		150.3
Approach LOS		E			E		F		F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.32
 Intersection Signal Delay: 117.5
 Intersection LOS: F
 Intersection Capacity Utilization 108.7%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 13: Elmwood Ave & Mt. Hope



Timings
14: Lattimore & Mt. Hope



Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	121	42	1022	1451
Turn Type	Perm			
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	26.0	24.0	24.0	24.0
Total Split (s)	34.0	76.0	76.0	76.0
Total Split (%)	30.9%	69.1%	69.1%	69.1%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	C-Max	C-Max	C-Max
Act Effct Green (s)	24.3		79.7	79.7
Actuated g/C Ratio	0.22		0.72	0.72
v/c Ratio	0.75		0.59	0.64
Control Delay	45.4		11.0	5.2
Queue Delay	0.0		0.0	0.0
Total Delay	45.4		11.0	5.2
LOS	D		B	A
Approach Delay	45.4		11.0	5.2
Approach LOS	D		B	A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 11.3
 Intersection Capacity Utilization 81.7%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 14: Lattimore & Mt. Hope



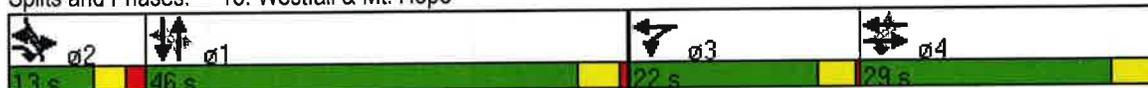
Timings
15: Westfall & Mt. Hope

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	12	200	301	522	148	90	925	235	140	1435
Turn Type	Perm		pt+ov	pm+pt		pm+pt		Perm	pm+pt	
Protected Phases		4	4 2	3	3 4	2	1		2	1
Permitted Phases	4			3 4		1		1	1	
Detector Phase	4	4	4 2	3	3 4	2	1	1	2	1
Switch Phase										
Minimum Initial (s)	6.0	6.0		4.0		5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	29.0	29.0		20.0		13.0	40.0	40.0	13.0	40.0
Total Split (s)	29.0	29.0	42.0	22.0	51.0	13.0	46.0	46.0	13.0	46.0
Total Split (%)	26.4%	26.4%	38.2%	20.0%	46.4%	11.8%	41.8%	41.8%	11.8%	41.8%
Yellow Time (s)	4.0	4.0		3.5		3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0		0.5		2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag		Lead		Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?				Yes						
Recall Mode	None	None		None		None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		23.8	36.4	44.8	46.8	55.2	45.6	44.6	55.2	45.6
Actuated g/C Ratio		0.22	0.33	0.41	0.43	0.50	0.41	0.41	0.50	0.41
v/c Ratio		0.60	0.62	1.23	0.40	0.45	0.70	0.36	0.61	1.09
Control Delay		45.3	33.9	151.0	18.5	18.2	29.8	13.6	34.2	92.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		45.3	33.9	151.0	18.5	18.2	29.8	13.6	34.2	92.4
LOS		D	C	F	B	B	C	B	C	F
Approach Delay		38.6			105.4		25.9			87.2
Approach LOS		D			F		C			F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.23
 Intersection Signal Delay: 66.2
 Intersection Capacity Utilization 98.4%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service F

Splits and Phases: 15: Westfall & Mt. Hope



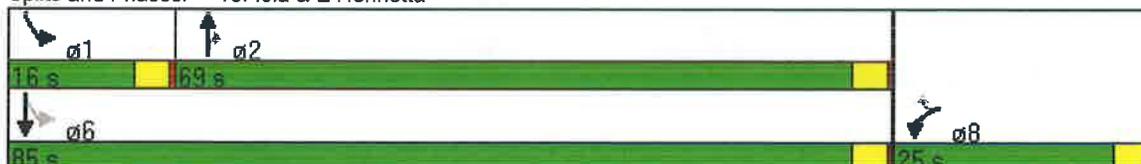


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	194	221	1437	181	160	1956
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	25.0	25.0	69.0	69.0	16.0	85.0
Total Split (%)	22.7%	22.7%	62.7%	62.7%	14.5%	77.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	17.5	17.5	70.7	70.7	84.5	84.5
Actuated g/C Ratio	0.16	0.16	0.64	0.64	0.77	0.77
v/c Ratio	0.75	0.58	0.69	0.18	0.64	0.78
Control Delay	60.3	15.4	13.7	2.0	23.2	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	60.3	15.4	13.7	2.0	23.2	10.4
LOS	E	B	B	A	C	B
Approach Delay	36.4		12.3			11.4
Approach LOS	D		B			B

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 14.3
 Intersection Capacity Utilization 71.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 18: Iola & E Henrietta



Timings

21: Crittenden Blvd & Kendrick

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	113	68	88	33	336	15	844	187	212	474	59
Turn Type	Perm		Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases		4		8		1	6		5	2	
Permitted Phases	4		8		8	6		6	2		2
Detector Phase	4	4	8	8	8	1	6	6	5	2	2
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	8.0	69.0	69.0	15.0	76.0	76.0
Total Split (%)	23.6%	23.6%	23.6%	23.6%	23.6%	7.3%	62.7%	62.7%	13.6%	69.1%	69.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	17.3	17.3		17.3	17.3	74.8	69.8	69.8	84.7	81.5	81.5
Actuated g/C Ratio	0.16	0.16		0.16	0.16	0.68	0.63	0.63	0.77	0.74	0.74
v/c Ratio	0.80	0.36		0.72	0.85	0.03	0.79	0.19	0.70	0.38	0.06
Control Delay	78.1	36.7		67.7	38.6	4.6	22.7	2.2	31.5	0.8	0.0
Queue Delay	18.4	0.0		0.0	11.5	0.0	0.6	0.0	0.0	0.4	0.0
Total Delay	96.5	36.7		67.7	50.1	4.6	23.3	2.2	31.5	1.2	0.0
LOS	F	D		E	D	A	C	A	C	A	A
Approach Delay		69.1		54.8			19.3			9.7	
Approach LOS		E		D			B			A	

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 27.2

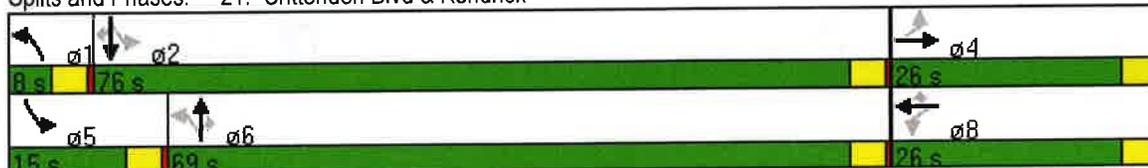
Intersection LOS: C

Intersection Capacity Utilization 81.5%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings
22: ELMWOOD AVENUE & Kendrick



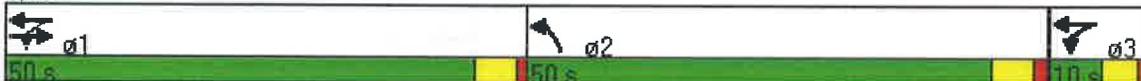
Lane Group	EBT	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↑↑	↑↑
Volume (vph)	735	162	1005	789
Turn Type		pm+pt		
Protected Phases	1	3	1 3	2
Permitted Phases		1 3		
Detector Phase	1	3	1 3	2
Switch Phase				
Minimum Initial (s)	15.0	4.0		10.0
Minimum Split (s)	34.0	10.0		26.0
Total Split (s)	50.0	10.0	60.0	50.0
Total Split (%)	45.5%	9.1%	54.5%	45.5%
Yellow Time (s)	4.0	3.5		4.0
All-Red Time (s)	1.0	1.5		1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lead			Lag
Lead-Lag Optimize?				
Recall Mode	C-Max	None		None
Act Effct Green (s)	47.0	54.0	57.0	47.0
Actuated g/C Ratio	0.43	0.49	0.52	0.43
v/c Ratio	0.95	1.00	0.61	1.02
Control Delay	39.5	101.7	33.3	48.3
Queue Delay	0.0	0.0	0.0	13.0
Total Delay	39.5	101.7	33.3	61.3
LOS	D	F	C	E
Approach Delay	39.5		42.8	61.3
Approach LOS	D		D	E

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 48.3
 Intersection Capacity Utilization 99.2%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 22: ELMWOOD AVENUE & Kendrick





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	229	203	470	94	66	781
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	249	221	511	102	72	849
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						1083
Upstream signal (ft)						1083
pX, platoon unblocked	0.94					
vC, conflicting volume	1554	562			613	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1558	562			613	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	58			93	
cM capacity (veh/h)	108	526			966	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	249	221	613	72	849	
Volume Left	249	0	0	72	0	
Volume Right	0	221	102	0	0	
cSH	108	526	1700	966	1700	
Volume to Capacity	2.30	0.42	0.36	0.07	0.50	
Queue Length 95th (ft)	547	51	0	6	0	
Control Delay (s)	677.6	16.7	0.0	9.0	0.0	
Lane LOS	F	C		A		
Approach Delay (s)	367.1		0.0	0.7		
Approach LOS	F					
Intersection Summary						
Average Delay			86.4			
Intersection Capacity Utilization			60.5%	ICU Level of Service		B
Analysis Period (min)			15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑	↓	
Volume (veh/h)	10	137	121	439	1004	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	152	134	488	1116	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					1247	
pX, platoon unblocked	0.96	0.96	0.96			
vC, conflicting volume	1872	1116	1116			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1887	1100	1100			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	81	39	78			
cM capacity (veh/h)	58	248	610			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	163	134	488	1116
Volume Left	11	134	0	0
Volume Right	152	0	0	0
cSH	203	610	1700	1700
Volume to Capacity	0.80	0.22	0.29	0.66
Queue Length 95th (ft)	143	21	0	0
Control Delay (s)	70.2	12.6	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	70.2	2.7		0.0
Approach LOS	F			

Intersection Summary			
Average Delay		6.9	
Intersection Capacity Utilization		78.6%	ICU Level of Service D
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations		↕			↕	↗		↕↔		↖	↖		
Volume (veh/h)	1	23	23	46	36	90	11	470	18	186	855	1	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.90	0.90	0.90	0.92	0.90	0.92	0.90	0.92	0.92	0.92	0.92	0.90	
Hourly flow rate (vph)	1	26	26	50	40	98	12	511	20	202	929	1	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type									None				
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	1732	1889	930	1917	1880	265	930					530	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	1732	1889	930	1917	1880	265	930					530	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1					4.1	
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2	
p0 queue free %	94	54	90	0	28	87	98					80	
cM capacity (veh/h)	18	55	269	20	56	733	731					1033	
Direction, Lane #	EB 1	WB 1	WB 2	NE 1	NE 2	SW 1	SW 2						
Volume Total	52	90	98	268	275	202	930						
Volume Left	1	50	0	12	0	202	0						
Volume Right	26	0	98	0	20	0	1						
cSH	84	28	733	731	1700	1033	1700						
Volume to Capacity	0.62	3.22	0.13	0.02	0.16	0.20	0.55						
Queue Length 95th (ft)	72	Err	11	1	0	18	0						
Control Delay (s)	101.9	Err	10.7	0.6	0.0	9.3	0.0						
Lane LOS	F	F	B	A		A							
Approach Delay (s)	101.9	4796.7		0.3		1.7							
Approach LOS	F	F											
Intersection Summary													
Average Delay			474.2										
Intersection Capacity Utilization			80.1%	ICU Level of Service				D					
Analysis Period (min)			15										

Intersection Sign configuration not allowed in HCM analysis.

Timings
91: Elmwood Ave & East Dr

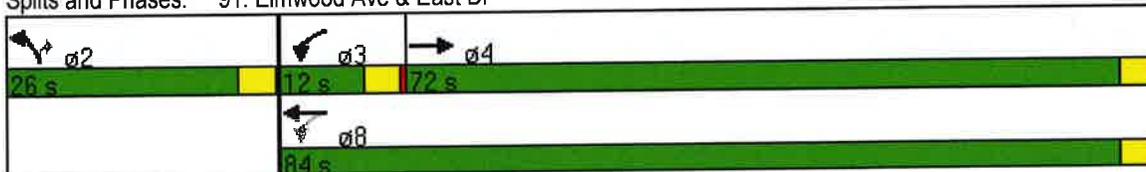


Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↖	↑↑	↖	↗
Volume (vph)	1454	123	1018	128	306
Turn Type		pm+pt			Perm
Protected Phases	4	3	8	2	
Permitted Phases		8			2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0	20.0
Total Split (s)	72.0	12.0	84.0	26.0	26.0
Total Split (%)	65.5%	10.9%	76.4%	23.6%	23.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	C-Max	Min	Min
Act Effct Green (s)	71.7	83.4	83.4	18.6	18.6
Actuated g/C Ratio	0.65	0.76	0.76	0.17	0.17
v/c Ratio	0.78	0.69	0.42	0.47	0.88
Control Delay	9.3	17.9	11.7	45.8	49.4
Queue Delay	0.6	0.0	0.0	0.0	0.0
Total Delay	9.8	17.9	11.7	45.8	49.4
LOS	A	B	B	D	D
Approach Delay	9.8		12.4	48.3	
Approach LOS	A		B	D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 16.0
 Intersection Capacity Utilization 70.7%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 91: Elmwood Ave & East Dr





Movement	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations			↙	↕	↗	↖
Volume (veh/h)	0	0	48	488	618	311
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	53	542	687	346
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1336	687	1032			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1336	687	1032			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	92			
cM capacity (veh/h)	156	447	673			
Direction, Lane #	NE 1	NE 2	SW 1	SW 2		
Volume Total	53	542	687	346		
Volume Left	53	0	0	0		
Volume Right	0	0	0	346		
cSH	673	1700	1700	1700		
Volume to Capacity	0.08	0.32	0.40	0.20		
Queue Length 95th (ft)	6	0	0	0		
Control Delay (s)	10.8	0.0	0.0	0.0		
Lane LOS	B					
Approach Delay (s)	1.0		0.0			
Approach LOS						
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			42.5%		ICU Level of Service A	
Analysis Period (min)			15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕↔		↔↕	↕↕
Volume (veh/h)	154	139	617	66	25	560
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.90	0.92	0.92	0.90
Hourly flow rate (vph)	167	151	686	72	27	622
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	300					
pX, platoon unblocked						
vC, conflicting volume	1087	379			757	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1087	379			757	
iC, single (s)	6.8	6.9			4.1	
iC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	18	76			97	
cM capacity (veh/h)	204	619			850	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	318	457	300	27	311	311
Volume Left	167	0	0	27	0	0
Volume Right	151	0	72	0	0	0
cSH	299	1700	1700	850	1700	1700
Volume to Capacity	1.07	0.27	0.18	0.03	0.18	0.18
Queue Length 95th (ft)	305	0	0	2	0	0
Control Delay (s)	109.1	0.0	0.0	9.4	0.0	0.0
Lane LOS	F			A		
Approach Delay (s)	109.1	0.0			0.4	
Approach LOS	F					
Intersection Summary						
Average Delay			20.3			
Intersection Capacity Utilization			44.5%	ICU Level of Service	A	
Analysis Period (min)			15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑	↘	
Volume (veh/h)	569	40	80	451	45	194
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	618	43	87	490	49	211
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	1254			938		
pX, platoon unblocked					0.98	
vC, conflicting volume			662		1304 331	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			662		1301 331	
tC, single (s)			4.1		6.8 6.9	
tC, 2 stage (s)						
tF (s)			2.2		3.5 3.3	
p0 queue free %			91		64 68	
cM capacity (veh/h)			923		136 665	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	412	250	87	490	260
Volume Left	0	0	87	0	49
Volume Right	0	43	0	0	211
cSH	1700	1700	923	1700	384
Volume to Capacity	0.24	0.15	0.09	0.29	0.68
Queue Length 95th (ft)	0	0	8	0	120
Control Delay (s)	0.0	0.0	9.3	0.0	32.0
Lane LOS			A		D
Approach Delay (s)	0.0		1.4		32.0
Approach LOS					D

Intersection Summary						
Average Delay			6.1			
Intersection Capacity Utilization			45.9%		ICU Level of Service	A
Analysis Period (min)	15					

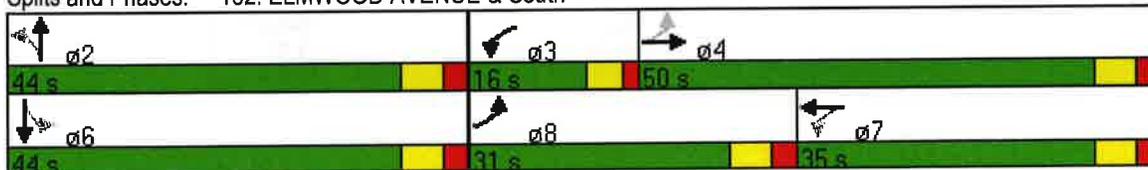


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↕	↖	↕		↕		↕
Volume (vph)	227	1374	257	689	7	628	62	509
Turn Type	pm+pt		pm+pt		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	4		7		2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	31.0	50.0	16.0	35.0	44.0	44.0	44.0	44.0
Total Split (%)	28.2%	45.5%	14.5%	31.8%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	63.0	47.0	45.0	32.0		41.0		41.0
Actuated g/C Ratio	0.57	0.43	0.41	0.29		0.37		0.37
v/c Ratio	0.49	1.04	1.02	0.79		0.80		0.96
Control Delay	35.5	40.8	91.1	42.2		25.8		56.0
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	35.5	40.8	91.1	42.2		25.8		56.0
LOS	D	D	F	D		C		E
Approach Delay		40.1		55.0		25.8		56.0
Approach LOS		D		D		C		E

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 43.2
 Intersection Capacity Utilization 112.1%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service H

Splits and Phases: 162: ELMWOOD AVENUE & South



Timings
393: ELMWOOD AVENUE & U of R



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↘	↑↑	↘	↗
Volume (vph)	1282	40	1138	31	46
Turn Type		pm+pt			Perm
Protected Phases	1	3	1 3	2	
Permitted Phases		1 3			2
Detector Phase	1	3	1 3	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	70.0	9.0	79.0	31.0	31.0
Total Split (%)	63.6%	8.2%	71.8%	28.2%	28.2%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effct Green (s)	67.0	73.0	76.0	28.0	28.0
Actuated g/C Ratio	0.61	0.66	0.69	0.25	0.25
v/c Ratio	0.69	0.21	0.52	0.08	0.12
Control Delay	15.5	3.7	1.9	31.9	9.5
Queue Delay	0.7	0.0	0.1	0.0	0.0
Total Delay	16.2	3.7	2.0	31.9	9.5
LOS	B	A	A	C	A
Approach Delay	16.2		2.0	18.4	
Approach LOS	B		A	B	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 9.8
 Intersection Capacity Utilization 48.4%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 393: ELMWOOD AVENUE & U of R



Timings
395: Crittenden Blvd & East Dr



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	68	631	368	201	157
Turn Type	Perm				Perm
Protected Phases		1	1	2	
Permitted Phases	1				2
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	15.0	15.0
Total Split (s)	64.0	64.0	64.0	46.0	46.0
Total Split (%)	58.2%	58.2%	58.2%	41.8%	41.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	81.1	81.1	81.1	22.9	22.9
Actuated g/C Ratio	0.74	0.74	0.74	0.21	0.21
v/c Ratio	0.13	0.27	0.21	0.61	0.37
Control Delay	5.1	5.0	0.5	45.8	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	5.0	0.5	45.8	7.2
LOS	A	A	A	D	A
Approach Delay		5.0	0.5	28.9	
Approach LOS		A	A	C	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 9.1
 Intersection Capacity Utilization 40.9%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	61	1	228	1	10	1473	162	1852
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	14.0	39.0	14.0	39.0
Total Split (s)	32.0	32.0	32.0	32.0	14.0	64.0	14.0	64.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	12.7%	58.2%	12.7%	58.2%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	26.7	26.7	26.7	26.7	74.3	63.4	74.3	63.4
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.68	0.58	0.68	0.58
v/c Ratio	0.26	0.20	0.85	0.28	0.05	0.91	0.74	1.04
Control Delay	35.5	8.0	64.6	7.1	8.4	25.8	45.5	34.0
Queue Delay	0.5	0.0	0.0	0.3	0.0	23.2	0.0	53.7
Total Delay	36.0	8.0	64.6	7.4	8.4	49.0	45.5	87.7
LOS	D	A	E	A	A	D	D	F
Approach Delay		20.0		44.7		48.8		84.4
Approach LOS		C		D		D		F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 64.9
 Intersection Capacity Utilization 87.3%
 Analysis Period (min) 15

Intersection LOS: E
 ICU Level of Service E

Splits and Phases: 470: MCH & E Henrietta



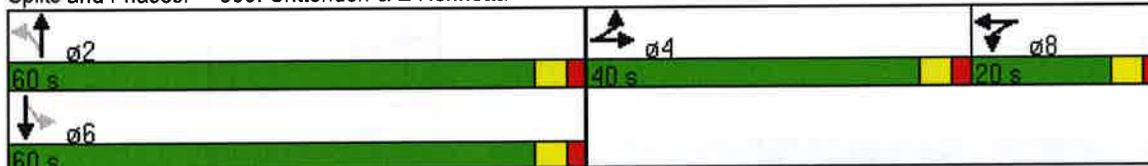


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	1015	1	1	94	1389	11	1497
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	40.0	40.0	20.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	16.7%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	37.0	37.0	9.1	69.4	69.4	69.4	69.4
Actuated g/C Ratio	0.31	0.31	0.08	0.58	0.58	0.58	0.58
v/c Ratio	1.35	1.24	0.15	1.60	0.76	0.17	1.11
Control Delay	204.0	157.6	41.6	357.8	23.1	21.8	83.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	22.5
Total Delay	204.0	157.6	41.6	357.8	23.1	21.8	106.2
LOS	F	F	D	F	C	C	F
Approach Delay		181.8	41.6		44.2		105.8
Approach LOS		F	D		D		F

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 105 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.60
 Intersection Signal Delay: 105.4
 Intersection Capacity Utilization 113.0%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H

Splits and Phases: 500: Crittenden & E Henrietta



Timings
501: Southland Drive & West Henrietta Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔	↔	↔	↔	↔
Volume (vph)	11	1	30	1	7	1931	29	1568
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	75.0	75.0	13.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	68.2%	68.2%	11.8%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		12.8		12.8	84.6	84.6	91.2	91.2
Actuated g/C Ratio		0.12		0.12	0.77	0.77	0.83	0.83
v/c Ratio		0.23		0.66	0.05	0.80	0.16	0.60
Control Delay		24.9		28.0	5.4	11.8	5.7	2.4
Queue Delay		0.0		0.0	0.0	0.1	0.0	0.3
Total Delay		24.9		28.0	5.4	11.9	5.7	2.7
LOS		C		C	A	B	A	A
Approach Delay		24.9		28.0		11.9		2.7
Approach LOS		C		C		B		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 62 (56%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 8.8
 Intersection Capacity Utilization 72.3%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 501: Southland Drive & West Henrietta Road



Timings
502: Doncaster Road & West Henrietta Road



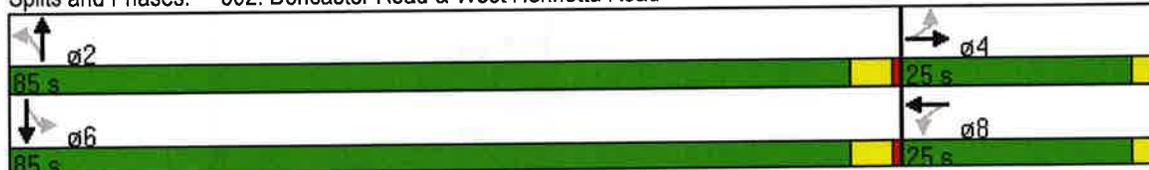
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕↕		↕↕
Volume (vph)	4	1	17	1	7	1936	14	1587
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		7.2		7.2		101.4		101.4
Actuated g/C Ratio		0.07		0.07		0.92		0.92
v/c Ratio		0.08		0.34		0.70		0.61
Control Delay		38.6		38.6		6.7		0.9
Queue Delay		0.0		0.0		0.2		0.1
Total Delay		38.6		38.6		6.8		1.0
LOS		D		D		A		A
Approach Delay		38.6		38.6		6.8		1.0
Approach LOS		D		D		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 71 (65%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 4.6
 Intersection Capacity Utilization 68.5%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 502: Doncaster Road & West Henrietta Road



Timings
503: Crittenden & West Henrietta Road

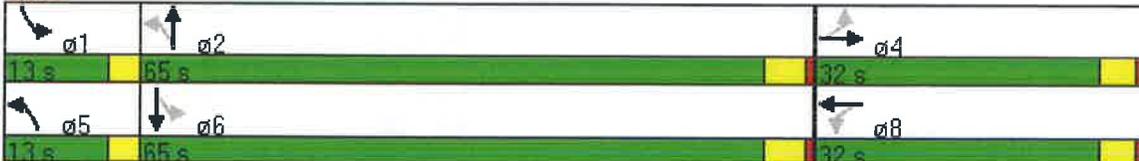


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕↕		↕↕	↖	↕↕	↖	↕↕
Volume (vph)	28	76	307	202	105	1641	236	1579
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	9.0	25.0	8.0	25.0
Total Split (s)	32.0	32.0	32.0	32.0	13.0	65.0	13.0	65.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	11.8%	59.1%	11.8%	59.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	0.0	1.0	0.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	0.0	-2.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		29.0		29.0	70.3	62.0	73.5	63.7
Actuated g/C Ratio		0.26		0.26	0.64	0.56	0.67	0.58
v/c Ratio		0.28		1.18	0.57	1.08	1.13	0.93
Control Delay		23.3		130.1	13.2	74.6	130.5	29.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.3		130.1	13.2	74.6	130.5	29.0
LOS		C		F	B	E	F	C
Approach Delay		23.3		130.1		71.4		41.3
Approach LOS		C		F		E		D

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.18
 Intersection Signal Delay: 67.3
 Intersection Capacity Utilization 107.8%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service G

Splits and Phases: 503: Crittenden & West Henrietta Road



Timings
504: BHTL & West Henrietta Road

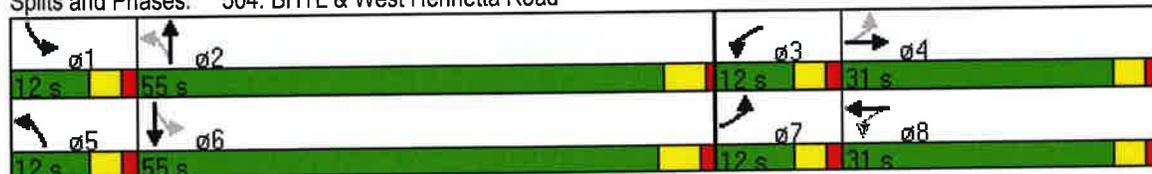


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	203	324	389	375	46	1595	167	1670
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	12.0	31.0	12.0	31.0	12.0	55.0	12.0	55.0
Total Split (%)	10.9%	28.2%	10.9%	28.2%	10.9%	50.0%	10.9%	50.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	34.2	25.2	34.2	25.2	61.5	53.3	65.4	57.6
Actuated g/C Ratio	0.31	0.23	0.31	0.23	0.56	0.48	0.59	0.52
v/c Ratio	1.06	0.54	1.57	0.78	0.26	1.20	0.79	1.13
Control Delay	108.0	37.7	298.6	40.4	12.9	123.3	35.9	89.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.0	37.7	298.6	40.4	12.9	123.3	35.9	89.9
LOS	F	D	F	D	B	F	D	F
Approach Delay		61.6		142.8		120.6		85.5
Approach LOS		E		F		F		F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 49 (45%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.57
 Intersection Signal Delay: 105.1
 Intersection Capacity Utilization 106.8%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service G

Splits and Phases: 504: BHTL & West Henrietta Road





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	122	13	240	41	14	366
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	136	14	267	46	16	407
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	727	289			312	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	727	289			312	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	65	98			99	
cM capacity (veh/h)	386	750			1248	
Direction, Lane #						
	WB 1	NB 1	SB 1			
Volume Total	150	312	422			
Volume Left	136	0	16			
Volume Right	14	46	0			
cSH	405	1700	1248			
Volume to Capacity	0.37	0.18	0.01			
Queue Length 95th (ft)	42	0	1			
Control Delay (s)	19.0	0.0	0.4			
Lane LOS	C		A			
Approach Delay (s)	19.0	0.0	0.4			
Approach LOS	C					
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			44.8%	ICU Level of Service		A
Analysis Period (min)			15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↗	↖
Volume (veh/h)	345	55	66	636	223	113
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	383	61	73	707	248	126
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	596		1318			
pX, platoon unblocked						
vC, conflicting volume			444		914	222
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			444		914	222
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		3	84
cM capacity (veh/h)			1112		255	781

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	256	189	309	471	248	126
Volume Left	0	0	73	0	248	0
Volume Right	0	61	0	0	0	126
cSH	1700	1700	1112	1700	255	781
Volume to Capacity	0.15	0.11	0.07	0.28	0.97	0.16
Queue Length 95th (ft)	0	0	5	0	231	14
Control Delay (s)	0.0	0.0	2.5	0.0	92.1	10.5
Lane LOS			A		F	B
Approach Delay (s)	0.0		1.0		64.7	
Approach LOS					F	

Intersection Summary						
Average Delay			15.6			
Intersection Capacity Utilization			53.1%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection								
Intersection Delay (sec/veh)	8.8							
Intersection LOS	A							
Approach	EB		WB		NB		SW	
Entry Lanes	2		2		1		2	
Conflicting Circle Lanes	2		2		2		2	
Adjusted Approach Flow (vph)	315		626		245		793	
Demand Flow Rate (pc/h)	321		639		250		810	
Vehicles Circulating (pc/h)	660		231		878		266	
Vehicles Exiting (pc/h)	416		897		103		209	
Follow-Up Headway (s)	3.186		3.186		3.186		3.186	
Ped Vol. Crossing Leg (#/hr)	0		0		0		0	
Ped Capacity Adjustment	1.000		1.000		1.000		1.000	
Approach Delay (sec/veh)	7.9		2.5		12.2		13.0	
Approach LOS	A		A		B		B	
Lane	Left	Right	Left	Bypass	Left	Left	Right	
Designated moves	LT	TR	LT	R	R	L	TR	
Assumed Moves	LT	TR	LT	R	R	L	TR	
Right Turn Channelized	Free							
Lane Utilization	0.470	0.530	1.000		1.000	0.769	0.231	
Critical Headway (s)	4.293	4.113	4.293		4.113	4.293	4.113	
Entry Flow Rate (pc/h)	151	170	244	395	250	623	187	
Capacity, Entry Lane (pc/h)	689	712	950	1938	611	926	938	
Entry HV Adjustment Factor	0.980	0.981	0.979	0.980	0.980	0.980	0.979	
Flow Rate, Entry (vph)	148	167	239	387	245	610	183	
Capacity, Entry (vph)	675	699	930	1900	599	907	918	
Volume to Capacity Ratio	0.219	0.239	0.257	0.204	0.409	0.673	0.199	
Control Delay (sec/veh)	7.9	8.0	6.5	0.0	12.2	15.1	5.9	
Level of Service	A	A	A	A	B	C	A	
95th-Percentile Queue (veh)	1	1	1	1	2	5	1	

AM Peak Hour

Build Conditions 20-Year

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HCM Unsignalized Intersection Capacity Analysis University of Rochester, October 2011 Revision
 1: East River Road & Kendrick 7/11/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized						Yes			Yes			
Volume (veh/h)	242	166	31	219	270	1545	10	83	116	247	57	92
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	269	184	34	243	300	1717	11	92	129	274	63	102
Approach Volume (veh/h)		488			543			103			440	
Crossing Volume (veh/h)		581			372			728			554	
High Capacity (veh/h)		875			1033			777			894	
High v/c (veh/h)		0.56			0.53			0.13			0.49	
Low Capacity (veh/h)		702			844			617			719	
Low v/c (veh/h)		0.69			0.64			0.17			0.61	
Intersection Summary												
Maximum v/c High			0.56									
Maximum v/c Low			0.69									
Intersection Capacity Utilization			116.3%		ICU Level of Service					H		

Timings
2: East River Road & I-390 S On Ramp

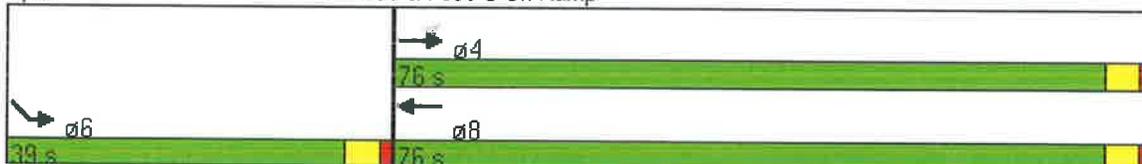
	↖	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SEL	SER
Lane Configurations	↖	↕	↕	↖	↗
Volume (vph)	253	277	1383	1367	575
Turn Type	Perm				Free
Protected Phases		4	8	6	
Permitted Phases	4				Free
Detector Phase	4	4	8	6	
Switch Phase					
Minimum Initial (s)	3.0	3.0	3.0	3.0	
Minimum Split (s)	25.0	25.0	25.0	25.0	
Total Split (s)	76.0	76.0	76.0	39.0	0.0
Total Split (%)	66.1%	66.1%	66.1%	33.9%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	3.0	3.0	3.0	2.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	Min	C-Min	
Act Effect Green (s)	71.0	73.0	73.0	36.0	115.0
Actuated g/C Ratio	0.62	0.63	0.63	0.31	1.00
v/c Ratio	3.51	0.14	0.75	1.41	0.40
Control Delay	1175.2	8.6	12.0	223.6	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	1175.2	8.6	12.0	223.6	0.8
LOS	F	A	B	F	A
Approach Delay		565.2	12.0	157.6	
Approach LOS		F	B	F	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 6:SEL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 3.51
 Intersection Signal Delay: 157.0
 Intersection Capacity Utilization 105.0%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service G

Splits and Phases: 2: East River Road & I-390 S On Ramp



Timings
3: College Town & Mt. Hope



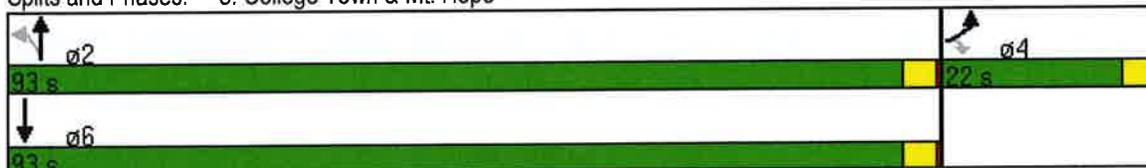
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	15	41	18	1175	1467
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	22.0	22.0	93.0	93.0	93.0
Total Split (%)	19.1%	19.1%	80.9%	80.9%	80.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	6.8	6.8	102.9	102.9	102.9
Actuated g/C Ratio	0.06	0.06	0.89	0.89	0.89
v/c Ratio	0.16	0.34	0.09	0.41	0.52
Control Delay	54.1	21.4	0.9	1.2	1.1
Queue Delay	0.0	0.9	0.0	0.4	0.3
Total Delay	54.1	22.3	0.9	1.6	1.5
LOS	D	C	A	A	A
Approach Delay	30.9			1.6	1.5
Approach LOS	C			A	A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 2.1
 Intersection Capacity Utilization 50.8%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: College Town & Mt. Hope





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↑↑↑	↑↑	↗
Volume (veh/h)	0	0	0	1879	901	200
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	2088	1001	222
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				267	774	
pX, platoon unblocked	0.88	0.80	0.80			
vC, conflicting volume	1697	501	1223			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	153	0	792			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	725	872	663			
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	696	696	696	501	501	222
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	222
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.41	0.41	0.41	0.29	0.29	0.13
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	39.6%			ICU Level of Service	A	
Analysis Period (min)	15					

Timings
6: East River Road & West Henrietta Road

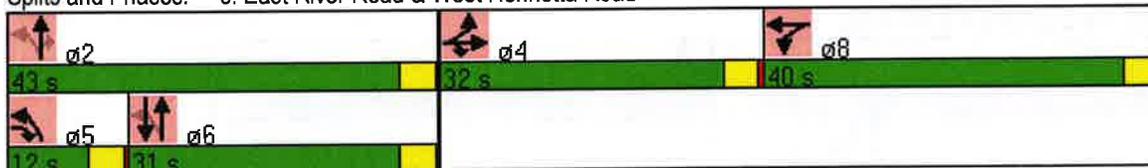


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Configurations									
Volume (vph)	543	73	867	119	1350	185	1160	77	802
Turn Type	Split		pt+ov	custom		pm+pt		custom	
Protected Phases	4	4	4 5	8	8	5	2 6		6
Permitted Phases				8		2 6	6	2	
Detector Phase	4	4	4 5	8	8	5	2 6	2	6
Switch Phase									
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0		8.0	8.0	8.0		20.0	20.0
Total Split (s)	32.0	32.0	44.0	40.0	40.0	12.0	74.0	43.0	31.0
Total Split (%)	27.8%	27.8%	38.3%	34.8%	34.8%	10.4%	64.3%	37.4%	27.0%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5		0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.5
Total Lost Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	1.5
Lead/Lag						Lead			Lag
Lead-Lag Optimize?						Yes			Yes
Recall Mode	None	None		None	None	None		C-Min	C-Min
Act Effect Green (s)	30.0	30.0	40.0	38.0	38.0	41.0	41.0	40.0	29.5
Actuated g/C Ratio	0.26	0.26	0.35	0.33	0.33	0.36	0.36	0.35	0.26
v/c Ratio	0.98	0.74	0.64	0.23	1.47	0.94	0.71	0.15	1.11
Control Delay	46.3	26.6	14.0	24.9	242.7	77.9	34.5	14.6	97.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	26.6	14.0	24.9	242.7	77.9	34.5	14.6	97.8
LOS	D	C	B	C	F	E	C	B	F
Approach Delay		27.8			227.0		39.1		97.8
Approach LOS		C			F		D		F

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 39 (34%), Referenced to phase 2:NBTL and 6:NBSB, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.47
 Intersection Signal Delay: 102.5
 Intersection Capacity Utilization 114.1%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H

Splits and Phases: 6: East River Road & West Henrietta Road



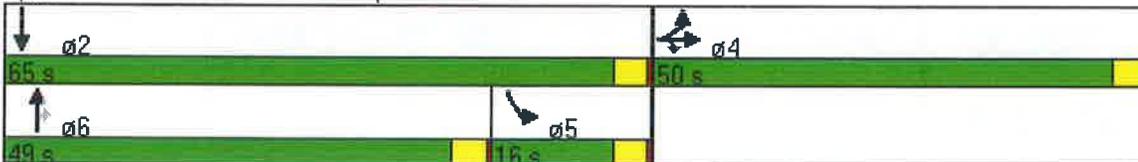
Timings
8: I-390 SB Ramp & E Henrietta

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Volume (vph)	574	98	1054	1050	260	337	1705
Turn Type	Split		Perm		Perm	Prot	
Protected Phases	4	4		6		5	2
Permitted Phases			4		6		
Detector Phase	4	4	4	6	6	5	2
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	50.0	50.0	50.0	49.0	49.0	16.0	65.0
Total Split (%)	43.5%	43.5%	43.5%	42.6%	42.6%	13.9%	56.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	1.5	1.5	1.5	3.0	3.0	3.0	3.0
Lead/Lag				Lead	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	48.5	48.5	48.5	44.1	44.1	14.9	62.0
Actuated g/C Ratio	0.42	0.42	0.42	0.38	0.38	0.13	0.54
v/c Ratio	0.69	0.96dr	0.95	0.86	0.39	0.84	0.99
Control Delay	33.5	31.4	59.4	40.0	7.8	46.2	26.6
Queue Delay	0.0	0.0	0.0	2.5	0.0	0.0	0.0
Total Delay	33.5	31.4	59.4	42.5	7.8	46.2	26.6
LOS	C	C	E	D	A	D	C
Approach Delay		40.5		35.6			29.8
Approach LOS		D		D			C

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 96 (83%), Referenced to phase 2:SBT and 6:NBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.99
 Intersection Signal Delay: 34.9
 Intersection Capacity Utilization 97.3%
 Analysis Period (min) 15
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: I-390 SB Ramp & E Henrietta



Timings
10: Westfall & E Henrietta

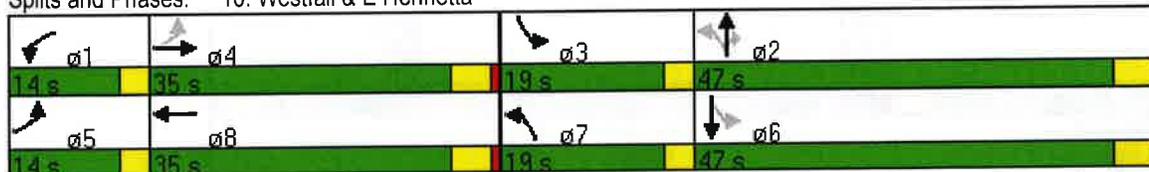


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↙	↕	↙	↕	↙	↕	↗	↙	↕
Volume (vph)	105	392	261	412	272	1319	547	229	1104
Turn Type	pm+pt		Prot		pm+pt		Perm	pm+pt	
Protected Phases	5	4	1	8	7	2		3	6
Permitted Phases	4				2		2	6	
Detector Phase	5	4	1	8	7	2	2	3	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	7.0	7.0	5.0	7.0
Minimum Split (s)	10.0	29.0	10.0	29.0	10.0	32.0	32.0	8.0	32.0
Total Split (s)	14.0	35.0	14.0	35.0	19.0	47.0	47.0	19.0	47.0
Total Split (%)	12.2%	30.4%	12.2%	30.4%	16.5%	40.9%	40.9%	16.5%	40.9%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0	-2.0	-1.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	37.2	27.9	11.0	29.6	65.5	49.5	48.5	61.9	47.3
Actuated g/C Ratio	0.32	0.24	0.10	0.26	0.57	0.43	0.42	0.54	0.41
v/c Ratio	0.55	0.64	0.88	0.77	0.93	0.96	0.71	0.87	0.95
Control Delay	33.2	40.8	79.3	40.0	60.0	43.6	19.0	52.9	47.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	35.6	1.1	0.0	0.0
Total Delay	33.2	40.8	79.3	40.0	60.0	79.2	20.1	52.9	47.7
LOS	C	D	E	D	E	E	C	D	D
Approach Delay		39.4		51.4		61.6			48.5
Approach LOS		D		D		E			D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 53.4
 Intersection LOS: D
 Intersection Capacity Utilization 87.7%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 10: Westfall & E Henrietta



Timings
11: South & E Henrietta

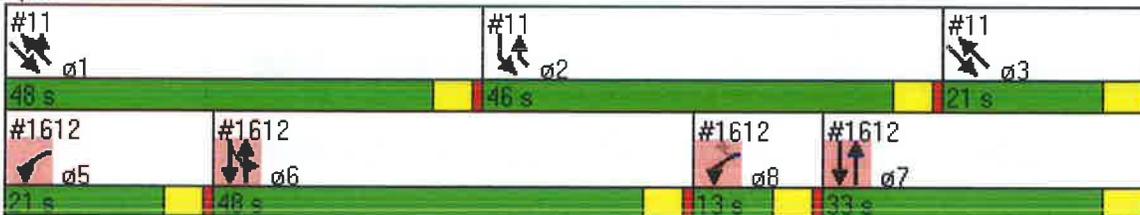
Lane Group	SBL	SET	NWT	NWR	ø1	ø3	ø5	ø6	ø7	ø8
Lane Configurations	↖↖	↕↕	↗	↖						
Volume (vph)	699	571	682	824						
Turn Type				custom						
Protected Phases	2	13	13	12	1	3	5	6	7	8
Permitted Phases		13		12						
Detector Phase	2	13	13	12						
Switch Phase										
Minimum Initial (s)	10.0				24.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	21.0	33.0	33.0	13.0
Total Split (s)	46.0	69.0	69.0	94.0	48.0	21.0	21.0	48.0	33.0	13.0
Total Split (%)	40.0%	60.0%	60.0%	81.7%	42%	18%	18%	42%	29%	11%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0						
Total Lost Time (s)	3.0	3.0	3.0	3.0						
Lead/Lag	Lag				Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None				C-Max	None	C-Max	None	None	None
Act Effect Green (s)	38.2	70.8	70.8	87.4						
Actuated g/C Ratio	0.33	0.62	0.62	0.76						
v/c Ratio	0.68	0.31	0.66	0.64						
Control Delay	50.2	2.6	19.0	5.8						
Queue Delay	4.8	0.0	0.1	0.8						
Total Delay	54.9	2.6	19.1	6.6						
LOS	D	A	B	A						
Approach Delay	54.9	2.6	12.3							
Approach LOS	D	A	B							

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NWSE and 5:, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 21.0
 Intersection Capacity Utilization 62.5%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 11: South & E Henrietta



Timings
12: Crittenden Blvd & Mt. Hope

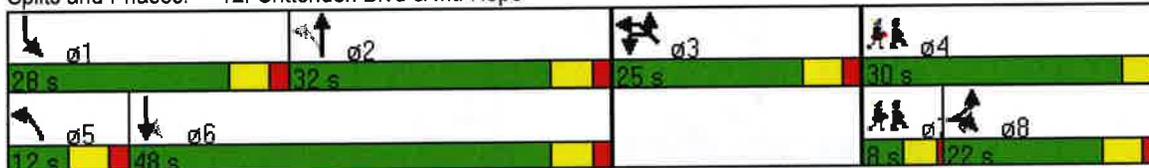


Lane Group	EBL	EBR	EBR2	NBL	NBT	SBL	SBT	NWL	NWR	ø4	ø7
Lane Configurations											
Volume (vph)	116	221	138	191	611	396	951	276	433		
Turn Type		Prot	Perm	pm+pt		pm+pt			Prot		
Protected Phases	8	8		5	2	1	6	3	3	4	7
Permitted Phases			8	2		6					
Detector Phase	8	8	8	5	2	1	6	3	3		
Switch Phase											
Minimum Initial (s)	13.0	13.0	13.0	5.0	7.0	5.0	7.0	6.0	6.0	4.0	4.0
Minimum Split (s)	19.0	19.0	19.0	12.0	27.0	12.0	27.0	18.0	18.0	25.0	8.0
Total Split (s)	22.0	22.0	22.0	12.0	32.0	28.0	48.0	25.0	25.0	30.0	8.0
Total Split (%)	19.1%	19.1%	19.1%	10.4%	27.8%	24.3%	41.7%	21.7%	21.7%	26%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.5	0.5
Lost Time Adjust (s)	-3.0	-3.0	-1.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes								Yes
Recall Mode	None	None	None	None	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	25.9	25.9	23.9	39.4	29.3	58.1	45.0	22.0	22.0		
Actuated g/C Ratio	0.23	0.23	0.21	0.34	0.25	0.51	0.39	0.19	0.19		
v/c Ratio	0.32	0.69	0.47	0.96	0.77	0.95	0.98	0.91	0.71		
Control Delay	41.7	53.6	47.5	82.3	56.2	53.2	52.8	73.8	16.6		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0		
Total Delay	41.7	53.6	47.5	82.3	56.2	53.2	57.9	73.8	16.6		
LOS	D	D	D	F	E	D	E	E	B		
Approach Delay	48.9				62.3		56.7	38.9			
Approach LOS	D				E		E	D			

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 99 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 53.4
 Intersection LOS: D
 Intersection Capacity Utilization 83.9%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 12: Crittenden Blvd & Mt. Hope





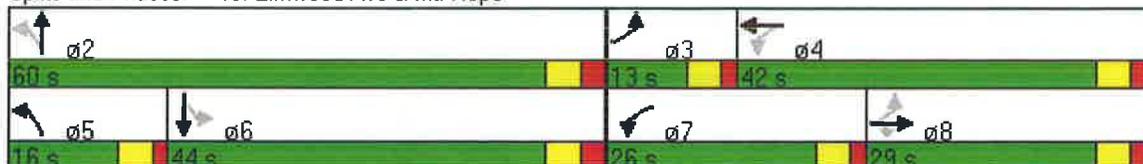
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↘	↖	↗	↖	↗	↖	↗
Volume (vph)	268	719	207	392	1188	214	818	45	873
Turn Type	pm+pt		Perm	pm+pt		pm+pt		Perm	
Protected Phases	3	8		7	4	5	2		6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	7	4	5	2	6	6
Switch Phase									
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	4.0	7.0	7.0	7.0
Minimum Split (s)	12.0	31.0	31.0	12.0	31.0	10.0	33.0	33.0	33.0
Total Split (s)	13.0	29.0	29.0	26.0	42.0	16.0	60.0	44.0	44.0
Total Split (%)	11.3%	25.2%	25.2%	22.6%	36.5%	13.9%	52.2%	38.3%	38.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	2.5	1.5	2.5	1.5	2.5	2.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-1.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	4.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead		Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	36.0	26.0	24.0	52.0	39.0	57.0	57.0	40.0	41.0
Actuated g/C Ratio	0.31	0.23	0.21	0.45	0.34	0.50	0.50	0.35	0.36
v/c Ratio	1.35	1.00	0.45	1.04	1.12	0.89	0.63	0.37	1.26
Control Delay	205.6	68.4	13.9	66.2	77.4	77.9	12.3	37.8	154.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	205.6	68.4	13.9	66.2	77.4	77.9	12.5	37.8	154.7
LOS	F	E	B	E	E	E	B	D	F
Approach Delay		89.8			74.6		24.3		151.2
Approach LOS		F			E		C		F

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 10 (9%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.35
 Intersection Signal Delay: 88.0
 Intersection Capacity Utilization 116.4%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service H

Splits and Phases: 13: Elmwood Ave & Mt. Hope



Timings
14: Lattimore & Mt. Hope



Lane Group	EBL	NBL	NBT	SBT
Lane Configurations	Y		↑↑	↑↑
Volume (vph)	11	146	826	979
Turn Type	Perm			
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	26.0	24.0	24.0	24.0
Total Split (s)	26.0	89.0	89.0	89.0
Total Split (%)	22.6%	77.4%	77.4%	77.4%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	C-Max	C-Max	C-Max
Act Effect Green (s)	9.2		99.8	99.8
Actuated g/C Ratio	0.08		0.87	0.87
v/c Ratio	0.29		0.59	0.39
Control Delay	25.7		17.9	0.2
Queue Delay	0.0		0.0	0.0
Total Delay	25.7		17.9	0.2
LOS	C		B	A
Approach Delay	25.7		17.9	0.2
Approach LOS	C		B	A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 9.0
 Intersection LOS: A
 Intersection Capacity Utilization 71.9%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 14: Lattimore & Mt. Hope



Timings
15: Westfall & Mt. Hope



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↗	↖	↗	↖	↕	↗	↖	↕
Volume (vph)	11	167	67	220	335	122	852	505	126	814
Turn Type	Perm	custom		Prot	custom			Perm	custom	
Protected Phases		4	4	3	3 4	2	1		2	1
Permitted Phases	4		4			2		1	2	
Detector Phase	4	4	4	3	3 4	2	1	1	2	1
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	5.0		5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	32.0	32.0	32.0	32.0		13.0	40.0	40.0	13.0	40.0
Total Split (s)	24.0	24.0	24.0	37.0	61.0	19.0	35.0	35.0	19.0	35.0
Total Split (%)	20.9%	20.9%	20.9%	32.2%	53.0%	16.5%	30.4%	30.4%	16.5%	30.4%
Yellow Time (s)	4.0	4.0	4.0	3.0		3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	1.0	2.0		2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	None	None	None		None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		20.0	20.0	29.3	52.3	14.1	39.6	38.6	14.1	39.6
Actuated g/C Ratio		0.17	0.17	0.25	0.45	0.12	0.34	0.34	0.12	0.34
v/c Ratio		0.64	0.24	0.54	0.60	0.63	0.78	0.81	0.65	0.75
Control Delay		53.8	21.7	38.3	17.3	45.3	34.0	24.6	40.8	26.8
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		53.8	21.7	38.3	17.3	45.3	34.0	24.6	40.8	26.8
LOS		D	C	D	B	D	C	C	D	C
Approach Delay		45.1			24.2		31.7			28.7
Approach LOS		D			C		C			C

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 34 (30%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 30.3
 Intersection Capacity Utilization 77.6%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 15: Westfall & Mt. Hope



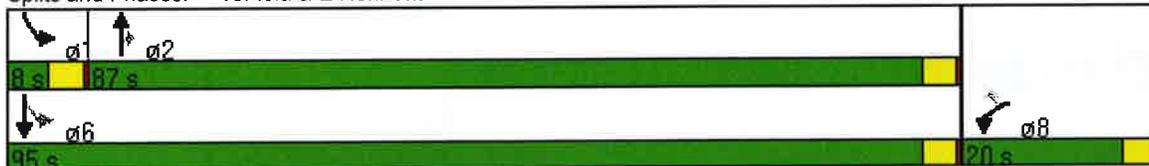
Timings
18: Iola & E Henrietta

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↖	↑↑	↗	↘	↑↑
Volume (vph)	114	30	2209	226	107	1284
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	87.0	87.0	8.0	95.0
Total Split (%)	17.4%	17.4%	75.7%	75.7%	7.0%	82.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)	13.0	13.0	83.5	83.5	94.0	94.0
Actuated g/C Ratio	0.11	0.11	0.73	0.73	0.82	0.82
v/c Ratio	0.64	0.16	0.95	0.21	0.72	0.49
Control Delay	62.8	16.3	19.9	0.3	41.9	8.2
Queue Delay	0.0	0.0	31.9	0.0	0.0	0.9
Total Delay	62.8	16.3	51.8	0.3	41.9	9.0
LOS	E	B	D	A	D	A
Approach Delay	53.2		47.0			11.6
Approach LOS	D		D			B

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 83 (72%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 34.8
 Intersection Capacity Utilization 83.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 18: Iola & E Henrietta



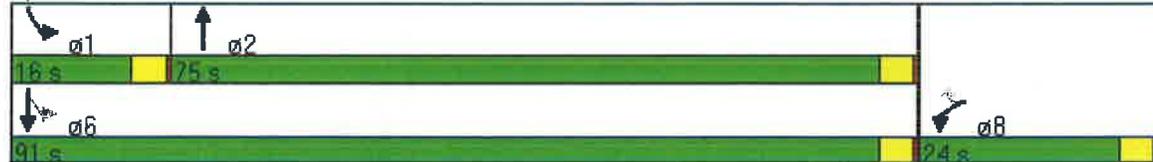
	↙	↗	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations	↙	↗	↑↑	↘	↓↓
Volume (vph)	91	162	433	199	1606
Turn Type		Perm		pm+pt	
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0
Total Split (s)	24.0	24.0	75.0	16.0	91.0
Total Split (%)	20.9%	20.9%	65.2%	13.9%	79.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	11.9	11.9	82.6	95.1	95.1
Actuated g/C Ratio	0.10	0.10	0.72	0.83	0.83
v/c Ratio	0.55	0.55	0.24	0.33	0.61
Control Delay	57.7	13.3	5.0	0.8	3.5
Queue Delay	0.0	0.0	0.3	0.0	10.6
Total Delay	57.7	13.3	5.3	0.8	14.1
LOS	E	B	A	A	B
Approach Delay	29.3		5.3		12.6
Approach LOS	C		A		B

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 12.7
 Intersection Capacity Utilization 56.1%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings
22: ELMWOOD AVENUE & Kendrick

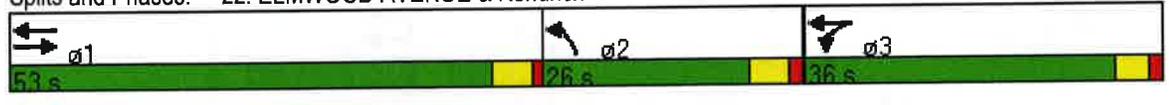


Lane Group	EBT	WBL	WBT	NBL
Lane Configurations	↑↓	↖	↑↑	↗↘
Volume (vph)	748	893	509	303
Turn Type		Prot		
Protected Phases	1	3	1 3	2
Permitted Phases				
Detector Phase	1	3	1 3	2
Switch Phase				
Minimum Initial (s)	15.0	4.0		10.0
Minimum Split (s)	34.0	10.0		26.0
Total Split (s)	53.0	36.0	89.0	26.0
Total Split (%)	46.1%	31.3%	77.4%	22.6%
Yellow Time (s)	4.0	3.5		4.0
All-Red Time (s)	1.0	1.5		1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lead			Lag
Lead-Lag Optimize?				
Recall Mode	C-Max	None		None
Act Effct Green (s)	50.0	33.7	86.7	22.3
Actuated g/C Ratio	0.43	0.29	0.75	0.19
v/c Ratio	1.15	1.92	0.21	0.84
Control Delay	101.3	441.5	8.0	40.1
Queue Delay	15.3	0.0	0.0	0.0
Total Delay	116.6	441.5	8.0	40.1
LOS	F	F	A	D
Approach Delay	116.6		284.0	40.1
Approach LOS	F		F	D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 110 (96%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.92
 Intersection Signal Delay: 168.5
 Intersection Capacity Utilization 127.2%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H

Splits and Phases: 22: ELMWOOD AVENUE & Kendrick



Timings
25: Lattimore & Kendrick



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	→	↖	→	↖	↑	↖	↑
Volume (vph)	33	1	73	1	527	833	140	699
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	14.0	20.0	14.0	20.0	46.0	53.0	28.0	35.0
Total Split (%)	12.2%	17.4%	12.2%	17.4%	40.0%	46.1%	24.3%	30.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	11.8	6.5	14.1	8.0	93.4	78.4	65.4	54.3
Actuated g/C Ratio	0.10	0.06	0.12	0.07	0.81	0.68	0.57	0.47
v/c Ratio	0.20	0.31	0.42	0.33	0.82	0.52	0.41	0.59
Control Delay	43.1	23.0	49.3	20.0	27.9	15.7	15.3	28.1
Queue Delay	0.0	0.0	0.0	0.0	0.6	0.1	0.0	0.3
Total Delay	43.1	23.0	49.3	20.0	28.5	15.8	15.3	28.5
LOS	D	C	D	B	C	B	B	C
Approach Delay		32.6		37.5		19.8		26.7
Approach LOS		C		D		B		C

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 23.4
 Intersection Capacity Utilization 75.0%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 25: Lattimore & Kendrick



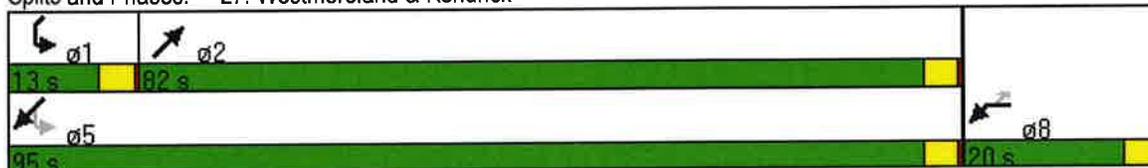


Lane Group	WBL	WBR	NET	SWL	SWT
Lane Configurations					
Volume (vph)	13	172	1595	92	483
Turn Type		Perm		pm+pt	
Protected Phases	8		2	1	5
Permitted Phases	8	8		5	
Detector Phase	8	8	2	1	5
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	82.0	13.0	95.0
Total Split (%)	17.4%	17.4%	71.3%	11.3%	82.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	Min
Act Effect Green (s)	9.6	9.6	86.5	97.4	97.4
Actuated g/C Ratio	0.08	0.08	0.75	0.85	0.85
v/c Ratio	0.10	0.71	0.67	0.43	0.18
Control Delay	37.3	35.8	5.8	28.1	0.5
Queue Delay	0.0	0.0	5.4	0.0	0.0
Total Delay	37.3	35.8	11.2	28.1	0.5
LOS	D	D	B	C	A
Approach Delay	35.9		11.2		4.9
Approach LOS	D		B		A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NET, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 11.6
 Intersection Capacity Utilization 63.9%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 27: Westmoreland & Kendrick



Intersection Sign configuration not allowed in HCM analysis.

Timings
91: Elmwood Ave & East Dr



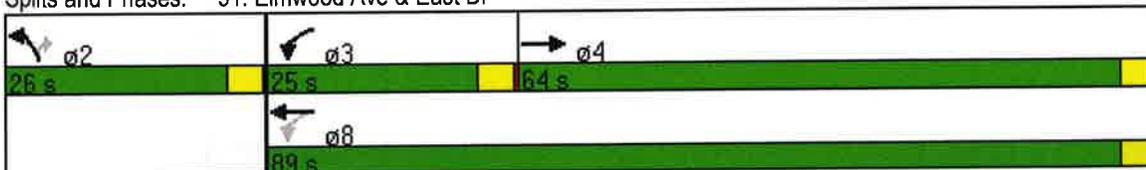
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↓	↖	↑↑	↖	↗
Volume (vph)	944	286	1647	104	191
Turn Type		pm+pt			Perm
Protected Phases	4	3	8	2	
Permitted Phases		8			2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0	20.0
Total Split (s)	64.0	25.0	89.0	26.0	26.0
Total Split (%)	55.7%	21.7%	77.4%	22.6%	22.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	C-Min	C-Min
Act Effct Green (s)	60.5	84.0	84.0	23.0	23.0
Actuated g/C Ratio	0.53	0.73	0.73	0.20	0.20
v/c Ratio	0.62	0.71	0.71	0.33	0.44
Control Delay	9.5	6.6	10.5	44.5	8.7
Queue Delay	0.1	0.0	0.0	0.0	0.0
Total Delay	9.5	6.6	10.5	44.5	8.7
LOS	A	A	B	D	A
Approach Delay	9.5		9.9	21.4	
Approach LOS	A		A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 86 (75%), Referenced to phase 2:NBL and 6:, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 10.9
 Intersection Capacity Utilization 60.3%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 91: Elmwood Ave & East Dr





Lane Group	NEL	NET	SWT	SWR
Lane Configurations				
Volume (vph)	175	1638	380	116
Turn Type	pm+pt			Perm
Protected Phases	5	6	6	
Permitted Phases	6			6
Detector Phase	5	6	6	6
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0
Total Split (s)	8.0	107.0	107.0	107.0
Total Split (%)	7.0%	93.0%	93.0%	93.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	C-Max
Act Effect Green (s)	107.0	103.0	103.0	103.0
Actuated g/C Ratio	0.93	0.90	0.90	0.90
v/c Ratio	0.20	1.07	0.25	0.09
Control Delay	0.7	51.6	0.7	0.1
Queue Delay	0.0	15.2	0.2	0.0
Total Delay	0.7	66.8	0.9	0.1
LOS	A	E	A	A
Approach Delay		60.4	0.7	
Approach LOS		E	A	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 95 (83%), Referenced to phase 2: and 6: NESW, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.07
 Intersection Signal Delay: 47.6
 Intersection Capacity Utilization 89.5%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 109: Kendrick &



Timings
117: Alpha Street & Kendrick



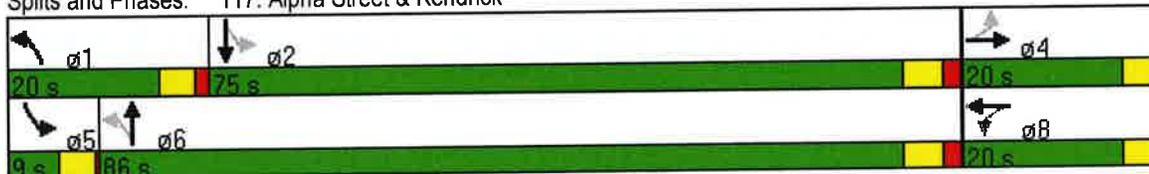
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↕	↖	↕
Volume (vph)	48	1	31	1	65	455	130	1280
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	1	6	5	2
Permitted Phases	4		8		6		2	
Detector Phase	4	4	8	8	1	6	5	2
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	11.0	10.0	4.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	32.0	8.0	32.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	86.0	9.0	75.0
Total Split (%)	17.4%	17.4%	17.4%	17.4%	17.4%	74.8%	7.8%	65.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.0	3.5	4.0
All-Red Time (s)	0.5	0.5	0.5	0.5	1.5	2.0	0.5	2.0
Lost Time Adjust (s)	-3.0	0.0	0.0	0.0	-2.0	-3.0	0.0	-3.0
Total Lost Time (s)	1.0	4.0	4.0	4.0	3.0	3.0	4.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes		
Recall Mode	None	None	None	None	Min	C-Max	None	C-Max
Act Effct Green (s)	13.3	10.3	10.3	10.3	99.6	89.1	89.2	83.6
Actuated g/C Ratio	0.12	0.09	0.09	0.09	0.87	0.77	0.78	0.73
v/c Ratio	0.38	0.29	0.28	0.34	0.24	0.29	0.23	0.72
Control Delay	53.5	16.7	53.3	16.0	3.5	3.8	1.9	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.7	0.2	0.0
Total Delay	53.5	16.7	53.3	16.0	3.5	4.5	2.1	9.3
LOS	D	B	D	B	A	A	A	A
Approach Delay		34.8		28.3		4.4		8.7
Approach LOS		C		C		A		A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 9.2
 Intersection Capacity Utilization 71.8%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 117: Alpha Street & Kendrick





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑	↘	
Volume (veh/h)	284	25	297	331	36	74
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	309	27	323	360	39	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	1254		938			
pX, platoon unblocked						
vC, conflicting volume			336		1328	168
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			336		1328	168
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			74		64	91
cM capacity (veh/h)			1220		108	847

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	206	130	323	360	120
Volume Left	0	0	323	0	39
Volume Right	0	27	0	0	80
cSH	1700	1700	1220	1700	261
Volume to Capacity	0.12	0.08	0.26	0.21	0.46
Queue Length 95th (ft)	0	0	27	0	56
Control Delay (s)	0.0	0.0	9.0	0.0	29.9
Lane LOS			A	D	
Approach Delay (s)	0.0		4.3	29.9	
Approach LOS				D	

Intersection Summary		
Average Delay		5.7
Intersection Capacity Utilization	41.6%	ICU Level of Service A
Analysis Period (min)		15

Timings
162: ELMWOOD AVENUE & South

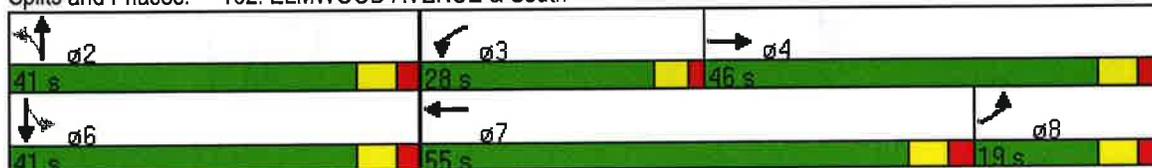


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↶	↶↷	↶	↶↷		↷↶		↷↶
Volume (vph)	227	621	228	1468	5	605	48	462
Turn Type	custom		Prot		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	8				2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	19.0	46.0	28.0	55.0	41.0	41.0	41.0	41.0
Total Split (%)	16.5%	40.0%	24.3%	47.8%	35.7%	35.7%	35.7%	35.7%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?								
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	16.0	45.4	22.6	52.0		38.0		38.0
Actuated g/C Ratio	0.14	0.39	0.20	0.45		0.33		0.33
v/c Ratio	1.02	0.52	0.73	1.06		0.77		1.03
Control Delay	72.0	13.8	55.8	70.9		30.5		75.0
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	72.0	13.8	55.8	70.9		30.5		75.0
LOS	E	B	E	E		C		E
Approach Delay		28.8		68.9		30.5		75.0
Approach LOS		C		E		C		E

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 8 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.06
 Intersection Signal Delay: 54.4
 Intersection Capacity Utilization 111.3%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service H

Splits and Phases: 162: ELMWOOD AVENUE & South





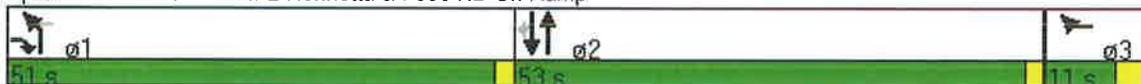
Lane Group	EBR	WBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	684	1065	253	1371	1358	92
Turn Type	custom	custom	Prot			Perm
Protected Phases	1	3	1	2	2	
Permitted Phases		1				2
Detector Phase	1	3	1	2	2	2
Switch Phase						
Minimum Initial (s)	48.0	4.0	48.0	48.0	48.0	48.0
Minimum Split (s)	50.0	8.0	50.0	50.0	50.0	50.0
Total Split (s)	51.0	11.0	51.0	53.0	53.0	53.0
Total Split (%)	44.3%	9.6%	44.3%	46.1%	46.1%	46.1%
Yellow Time (s)	2.0	3.5	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.5	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	2.0	4.0	2.0	2.0	2.0	2.0
Lead/Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?						
Recall Mode	Max	None	Max	C-Max	C-Max	C-Max
Act Effect Green (s)	49.0	58.0	49.0	51.0	51.0	51.0
Actuated g/C Ratio	0.43	0.50	0.43	0.44	0.44	0.44
v/c Ratio	0.99	0.84	0.19	0.97	0.96	0.15
Control Delay	57.9	31.4	24.2	30.3	55.7	23.7
Queue Delay	0.0	0.0	0.0	0.0	1.9	0.0
Total Delay	57.9	31.4	24.2	30.3	57.6	23.7
LOS	E	C	C	C	E	C
Approach Delay				29.3	55.5	
Approach LOS				C	E	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 99 (86%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.99
 Intersection Signal Delay: 41.7
 Intersection Capacity Utilization 127.3%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service H

Splits and Phases: 222: E Henrietta & I-390 NB On Ramp





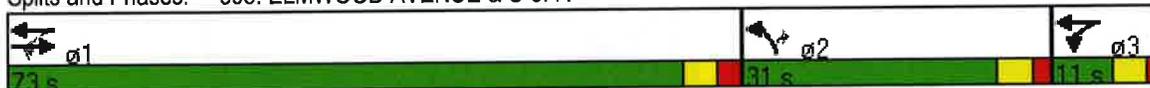
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↘	↑↑	↘	↗
Volume (vph)	996	64	1358	43	31
Turn Type		pm+pt			Perm
Protected Phases	1	3	13	2	
Permitted Phases		13			2
Detector Phase	1	3	13	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	73.0	11.0	84.0	31.0	31.0
Total Split (%)	63.5%	9.6%	73.0%	27.0%	27.0%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effct Green (s)	70.0	78.0	81.0	28.0	28.0
Actuated g/C Ratio	0.61	0.68	0.70	0.24	0.24
v/c Ratio	0.54	0.22	0.61	0.11	0.08
Control Delay	15.1	3.7	3.3	34.8	11.5
Queue Delay	0.1	0.0	0.4	0.0	0.0
Total Delay	15.2	3.7	3.6	34.8	11.5
LOS	B	A	A	C	B
Approach Delay	15.2		3.6	25.2	
Approach LOS	B		A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 9.0
 Intersection Capacity Utilization 49.2%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 393: ELMWOOD AVENUE & U of R





Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↑↑	↑↑	↔	↔
Volume (vph)	84	305	501	84	246
Turn Type	Perm				Perm
Protected Phases		1	1	2	
Permitted Phases	1				2
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	15.0	15.0
Total Split (s)	69.0	69.0	69.0	46.0	46.0
Total Split (%)	60.0%	60.0%	60.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	93.9	93.9	93.9	15.1	15.1
Actuated g/C Ratio	0.82	0.82	0.82	0.13	0.13
v/c Ratio	0.17	0.12	0.26	0.40	0.61
Control Delay	3.4	2.4	0.3	50.0	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	2.4	0.3	50.0	11.5
LOS	A	A	A	D	B
Approach Delay		2.7	0.3	21.3	
Approach LOS		A	A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 6.0
 Intersection Capacity Utilization 40.4%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr



Timings
470: MCH & E Henrietta



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	→	↙	←	↖	↑	↘	↓
Volume (vph)	30	1	63	2	196	1934	43	1320
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	14.0	39.0	14.0	39.0
Total Split (s)	26.0	26.0	26.0	26.0	14.0	75.0	14.0	75.0
Total Split (%)	22.6%	22.6%	22.6%	22.6%	12.2%	65.2%	12.2%	65.2%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	13.6	13.6	13.6	13.6	92.4	78.3	92.4	78.3
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.80	0.68	0.80	0.68
v/c Ratio	0.51	0.09	0.43	0.64	0.63	0.95	0.17	0.66
Control Delay	72.8	19.0	53.7	26.1	26.0	13.4	15.8	2.4
Queue Delay	1.3	0.0	0.0	0.8	0.0	41.0	0.0	0.5
Total Delay	74.1	19.0	53.7	27.0	26.0	54.4	15.8	3.0
LOS	E	B	D	C	C	D	B	A
Approach Delay		54.7		34.0		51.9		3.3
Approach LOS		D		C		D		A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 2 (2%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 33.1
 Intersection LOS: C
 Intersection Capacity Utilization 89.5%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 470: MCH & E Henrietta



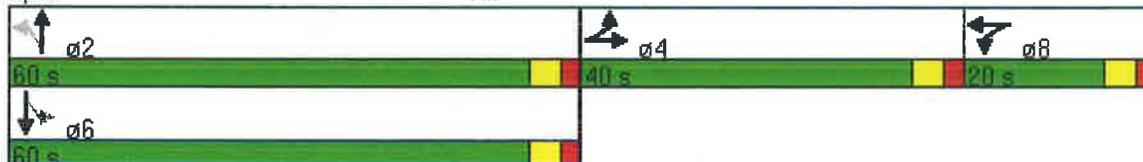


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	384	10	1	55	926	31	1573
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	40.0	40.0	20.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	16.7%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	28.4	28.4	8.0	81.2	81.2	81.2	81.2
Actuated g/C Ratio	0.24	0.24	0.07	0.68	0.68	0.68	0.68
v/c Ratio	0.72	0.67	0.06	0.95	0.43	0.12	1.31
Control Delay	51.9	43.6	0.4	128.6	11.3	11.9	164.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	18.4
Total Delay	51.9	43.6	0.4	128.6	11.3	11.9	182.5
LOS	D	D	A	F	B	B	F
Approach Delay		47.8	0.4		17.8		180.6
Approach LOS		D	A		B		F

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 105 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.31
 Intersection Signal Delay: 126.6
 Intersection Capacity Utilization 108.1%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service G

Splits and Phases: 500: Crittenden & E Henrietta



Timings
501: Southland Drive & West Henrietta Road

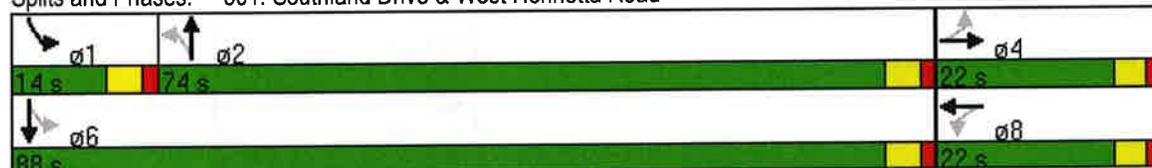


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔	↖	↗	↖	↗
Volume (vph)	41	1	8	1	1	1366	85	1685
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	74.0	74.0	14.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	67.3%	67.3%	12.7%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		11.2		11.2	86.1	86.1	94.9	95.5
Actuated g/C Ratio		0.10		0.10	0.78	0.78	0.86	0.87
v/c Ratio		0.34		0.16	0.01	0.56	0.30	0.62
Control Delay		47.1		26.1	3.0	7.0	4.0	4.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.3
Total Delay		47.1		26.1	3.0	7.1	4.0	4.3
LOS		D		C	A	A	A	A
Approach Delay		47.1		26.1		7.1		4.3
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.62
 Intersection Signal Delay: 6.3
 Intersection Capacity Utilization 66.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 501: Southland Drive & West Henrietta Road



Timings
502: Doncaster Road & West Henrietta Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Volume (vph)	12	1	4	2	1	1374	12	1681
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)		6.6		6.5		104.5		104.5
Actuated g/C Ratio		0.06		0.06		0.95		0.95
v/c Ratio		0.13		0.17		0.48		0.60
Control Delay		48.8		33.2		3.0		2.6
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		48.8		33.2		3.0		2.6
LOS		D		C		A		A
Approach Delay		48.8		33.2		3.0		2.6
Approach LOS		D		C		A		A

Intersection Summary

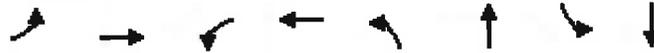
Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 75 (68%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 3.1
 Intersection Capacity Utilization 65.1%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 502: Doncaster Road & West Henrietta Road



Timings
503: Crittenden & West Henrietta Road

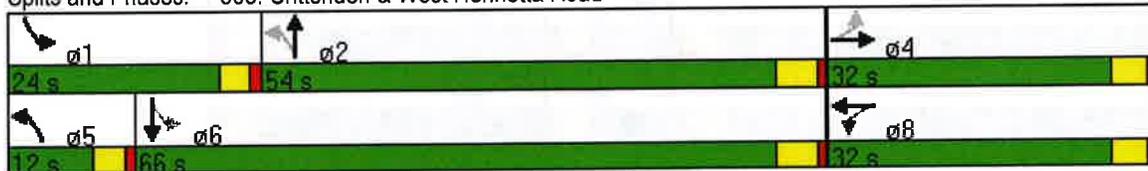


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕↕		↕↕	↖	↕↕	↖	↕↕
Volume (vph)	121	201	268	47	27	961	388	1270
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	9.0	25.0	8.0	25.0
Total Split (s)	32.0	32.0	32.0	32.0	12.0	54.0	24.0	66.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	10.9%	49.1%	21.8%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?						C-Max	None	C-Max
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		29.0		29.0	58.1	51.0	75.0	68.7
Actuated g/C Ratio		0.26		0.26	0.53	0.46	0.68	0.62
v/c Ratio		1.24dl		1.02	0.13	0.78	1.05	0.65
Control Delay		57.2		68.7	8.7	39.1	88.4	10.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		57.2		68.7	8.7	39.1	88.4	10.4
LOS		E		E	A	D	F	B
Approach Delay		57.3		68.7		38.4		28.4
Approach LOS		E		E		D		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.05
 Intersection Signal Delay: 40.6
 Intersection Capacity Utilization 96.2%
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 503: Crittenden & West Henrietta Road



Timings
504: BHTL & West Henrietta Road



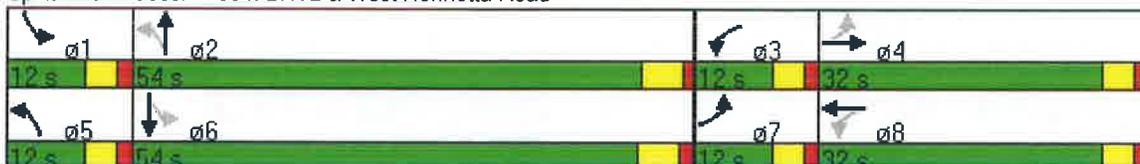
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↶	↷	↶	↷	↶	↷	↶	↷
Volume (vph)	175	394	143	354	42	870	242	1108
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	12.0	32.0	12.0	32.0	12.0	54.0	12.0	54.0
Total Split (%)	10.9%	29.1%	10.9%	29.1%	10.9%	49.1%	10.9%	49.1%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	31.9	22.9	31.9	22.9	59.1	51.0	68.5	60.0
Actuated g/C Ratio	0.29	0.21	0.29	0.21	0.54	0.46	0.62	0.55
v/c Ratio	0.87	0.62	0.65	0.70	0.24	0.75	0.83	0.79
Control Delay	64.4	42.8	40.6	42.3	12.2	27.1	41.7	33.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.4	42.8	40.6	42.3	12.2	27.1	41.7	33.4
LOS	E	D	D	D	B	C	D	C
Approach Delay		49.2		41.9		26.5		34.7
Approach LOS		D		D		C		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 35.6
 Intersection Capacity Utilization 80.8%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 504: BHTL & West Henrietta Road





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕			↕
Volume (veh/h)	68	10	485	133	2	191
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	76	11	539	148	2	212
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	829	613			687	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	829	613			687	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	78	98			100	
cM capacity (veh/h)	339	492			907	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	87	687	214
Volume Left	76	0	2
Volume Right	11	148	0
cSH	353	1700	907
Volume to Capacity	0.25	0.40	0.00
Queue Length 95th (ft)	24	0	0
Control Delay (s)	18.5	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	18.5	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		44.7%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↔↑	↔	↔
Volume (veh/h)	1432	242	270	1364	137	52
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1591	269	300	1516	152	58
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	667			1246		
pX, platoon unblocked			0.94		0.73	0.94
vC, conflicting volume			1860		3083	930
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1792		2766	806
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			7		0	81
cM capacity (veh/h)			322		1	306

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	1061	799	805	1010	152	58
Volume Left	0	0	300	0	152	0
Volume Right	0	269	0	0	0	58
cSH	1700	1700	322	1700	1	306
Volume to Capacity	0.62	0.47	0.93	0.59	198.14	0.19
Queue Length 95th (ft)	0	0	233	0	Err	17
Control Delay (s)	0.0	0.0	71.0	0.0	Err	19.5
Lane LOS			F		F	C
Approach Delay (s)	0.0		31.5		7253.3	
Approach LOS					F	

Intersection Summary						
Average Delay			406.7			
Intersection Capacity Utilization			110.4%	ICU Level of Service		H
Analysis Period (min)			15			



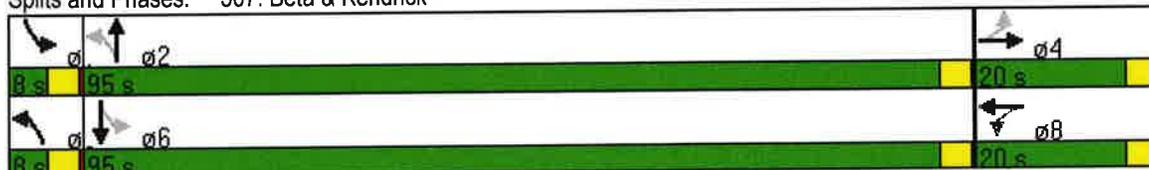
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	20	1	39	1	108	676	131	1143
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	8.0	95.0	8.0	95.0
Total Split (%)	16.3%	16.3%	16.3%	16.3%	6.5%	77.2%	6.5%	77.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	16.0	16.0	16.0	16.0	95.0	91.0	95.0	91.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.77	0.74	0.77	0.74
v/c Ratio	0.12	0.13	0.24	0.10	0.43	0.35	0.32	0.53
Control Delay	49.3	18.3	52.0	19.9	7.4	5.7	4.5	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.6	0.0	9.9
Total Delay	49.3	18.3	52.0	19.9	7.4	6.3	4.5	17.5
LOS	D	B	D	B	A	A	A	B
Approach Delay		31.4		40.8		6.4		16.3
Approach LOS		C		D		A		B

Intersection Summary

Cycle Length: 123
 Actuated Cycle Length: 123
 Offset: 115 (93%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 13.4
 Intersection Capacity Utilization 59.1%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 507: Beta & Kendrick



Intersection							
Intersection Delay (sec/veh)	5.8						
Intersection LOS	A						
Approach	EB		WB		NB		SB
Entry Lanes	2		2		1		2
Conflicting Circle Lanes	2		2		2		2
Adjusted Approach Flow (vph)	487		2260		232		439
Demand Flow Rate (pc/h)	497		2305		237		447
Vehicles Circulating (pc/h)	591		379		741		565
Vehicles Exiting (pc/h)	421		599		347		368
Follow-Up Headway (s)	3.186		3.186		3.186		3.186
Ped Vol. Crossing Leg (#/hr)	0		0		0		0
Ped Capacity Adjustment	1.000		1.000		1.000		1.000
Approach Delay (sec/veh)	9.3		3.7		10.2		10.3
Approach LOS	A		A		B		B
Lane	Left	Right	Left	Bypass	Left	Left	Right
Designated moves	LT	TR	LT	R	LTR	LT	R
Assumed Moves	L	TR	LT	R	LTR	LT	R
Right Turn Channelized	Free						
Lane Utilization	0.551	0.449	1.000		1.000	0.767	0.233
Critical Headway (s)	4.293	4.113	4.293		4.113	4.293	4.113
Entry Flow Rate (pc/h)	274	223	554	1751	237	343	104
Capacity, Entry Lane (pc/h)	725	747	850	1938	673	740	761
Entry HV Adjustment Factor	0.982	0.979	0.980	0.980	0.980	0.982	0.981
Flow Rate, Entry (vph)	269	218	543	1717	232	337	102
Capacity, Entry (vph)	712	731	833	1900	659	726	746
Volume to Capacity Ratio	0.378	0.298	0.651	0.904	0.352	0.464	0.137
Control Delay (sec/veh)	10.0	8.5	15.3	0.0	10.2	11.5	6.3
Level of Service	A	A	C	A	B	B	A
95th-Percentile Queue (veh)	2	1	5	16	2	2	0

PM Peak Hour

Build Conditions 20-Year

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized						Yes			Yes			
Volume (veh/h)	114	114	90	155	133	520	17	262	304	757	51	219
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	127	127	100	172	148	578	19	291	338	841	57	243
Approach Volume (veh/h)		353			320			310			1141	
Crossing Volume (veh/h)		1070			437			1094			339	
High Capacity (veh/h)		588			982			576			1061	
High v/c (veh/h)		0.60			0.33			0.54			1.08	
Low Capacity (veh/h)		453			797			443			868	
Low v/c (veh/h)		0.78			0.40			0.70			1.31	
Intersection Summary												
Maximum v/c High			1.08									
Maximum v/c Low			1.31									
Intersection Capacity Utilization		122.9%			ICU Level of Service				H			

Timings
2: East River Road & I-390 S On Ramp



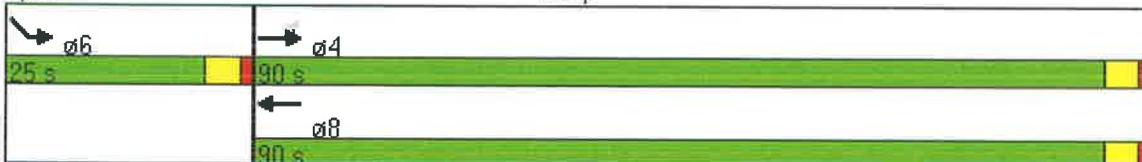
Lane Group	EBL	EBT	WBT	SEL	SER
Lane Configurations	↘	↑↑	↑↑	↘↘	↘
Volume (vph)	902	275	604	746	218
Turn Type	Perm				Free
Protected Phases		4	8	6	
Permitted Phases	4				Free
Detector Phase	4	4	8	6	
Switch Phase					
Minimum Initial (s)	5.0	5.0	10.0	5.0	
Minimum Split (s)	10.0	10.0	20.0	10.0	
Total Split (s)	90.0	90.0	90.0	25.0	0.0
Total Split (%)	78.3%	78.3%	78.3%	21.7%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	-2.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	3.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	
Act Effect Green (s)	85.0	85.0	85.0	22.0	115.0
Actuated g/C Ratio	0.74	0.74	0.74	0.19	1.00
v/c Ratio	2.98	0.12	0.43	1.26	0.15
Control Delay	915.0	4.4	6.4	168.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	915.0	4.4	6.4	168.9	0.2
LOS	F	A	A	F	A
Approach Delay		702.0	6.4	130.8	
Approach LOS		F	A	F	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 6:SEL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.98
 Intersection Signal Delay: 309.9
 Intersection Capacity Utilization 110.8%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service H

Splits and Phases: 2: East River Road & I-390 S On Ramp



Timings
3: College Town & Mt. Hope



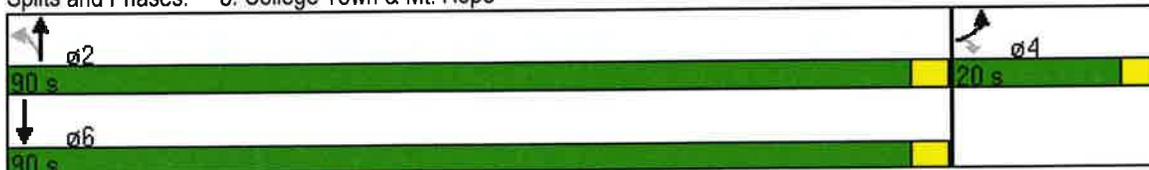
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	36	97	84	1632	1531
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	90.0	90.0	90.0
Total Split (%)	18.2%	18.2%	81.8%	81.8%	81.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.3	9.3	92.7	92.7	92.7
Actuated g/C Ratio	0.08	0.08	0.84	0.84	0.84
v/c Ratio	0.27	0.57	0.51	0.61	0.58
Control Delay	50.0	35.7	12.8	6.0	0.8
Queue Delay	0.6	0.0	0.0	0.5	1.1
Total Delay	50.6	35.7	12.8	6.5	1.9
LOS	D	D	B	A	A
Approach Delay	39.7			6.8	1.9
Approach LOS	D			A	A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 14 (13%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 5.8
 Intersection Capacity Utilization 61.3%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 3: College Town & Mt. Hope





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↑↑↑	↑↑	↗
Volume (veh/h)	0	0	0	2013	1436	771
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	2237	1596	857
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				267	774	
pX, platoon unblocked	0.80	0.66	0.66			
vC, conflicting volume	2341	798	2452			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	170	0	2174			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	640	719	160			
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	746	746	746	798	798	857
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	857
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.44	0.44	0.44	0.47	0.47	0.50
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	51.1%			ICU Level of Service	A	
Analysis Period (min)	15					

Timings
6: East River Road & West Henrietta Road

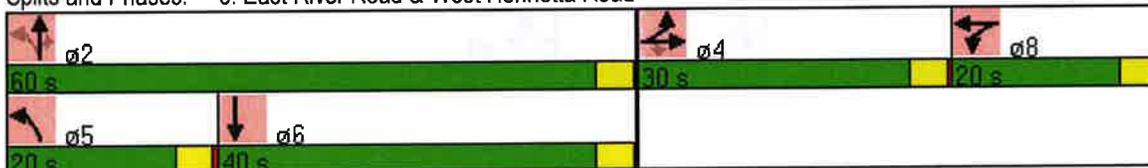


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Configurations									
Volume (vph)	309	290	542	173	488	111	1637	361	1092
Turn Type	Split		Perm	Split		pm+pt		Perm	
Protected Phases	4	4		8	8	5	2		6
Permitted Phases			4			2		2	
Detector Phase	4	4	4	8	8	5	2	2	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	30.0	30.0	30.0	20.0	20.0	20.0	60.0	60.0	40.0
Total Split (%)	27.3%	27.3%	27.3%	18.2%	18.2%	18.2%	54.5%	54.5%	36.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.5
Total Lost Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	1.5
Lead/Lag						Lead			Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	Min	C-Min	C-Min	C-Min
Act Effct Green (s)	26.5	26.5	26.5	19.5	19.5	58.0	58.0	57.0	45.0
Actuated g/C Ratio	0.24	0.24	0.24	0.18	0.18	0.53	0.53	0.52	0.41
v/c Ratio	0.80	0.78	0.52	0.61	0.98	0.49	0.68	0.44	1.12
Control Delay	42.3	25.0	13.8	51.9	77.4	28.2	16.6	9.5	88.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	42.3	25.0	13.8	51.9	77.4	28.2	16.9	9.5	88.4
LOS	D	C	B	D	E	C	B	A	F
Approach Delay		26.6			71.3		16.2		88.4
Approach LOS		C			E		B		F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Red
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 44.9
 Intersection Capacity Utilization 91.5%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 6: East River Road & West Henrietta Road



Timings
8: I-390 SB Ramp & E Henrietta



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Volume (vph)	252	502	569	1521	909	545	1437
Turn Type	Split		Perm		Free	Prot	
Protected Phases	8	8		1		2	12
Permitted Phases			8		Free		
Detector Phase	8	8	8	1		2	12
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	3.0		4.0	
Minimum Split (s)	20.0	20.0	20.0	8.0		20.0	
Total Split (s)	33.0	33.0	33.0	57.0	0.0	20.0	77.0
Total Split (%)	30.0%	30.0%	30.0%	51.8%	0.0%	18.2%	70.0%
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag				Lead		Lag	
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max		Max	
Act Effct Green (s)	30.0	30.0	30.0	54.0	110.0	17.0	74.0
Actuated g/C Ratio	0.27	0.27	0.27	0.49	1.00	0.15	0.67
v/c Ratio	0.57	0.97	0.89	0.97	0.64	1.14	0.67
Control Delay	42.5	63.6	59.7	44.0	2.0	126.7	12.5
Queue Delay	0.0	0.0	0.0	1.4	0.0	0.0	0.0
Total Delay	42.5	63.6	59.7	45.4	2.0	126.7	12.5
LOS	D	E	E	D	A	F	B
Approach Delay		59.0		29.1			43.9
Approach LOS		E		C			D

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 78 (71%), Referenced to phase 1:NBSB and 5:, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 41.1
 Intersection Capacity Utilization 85.8%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 8: I-390 SB Ramp & E Henrietta



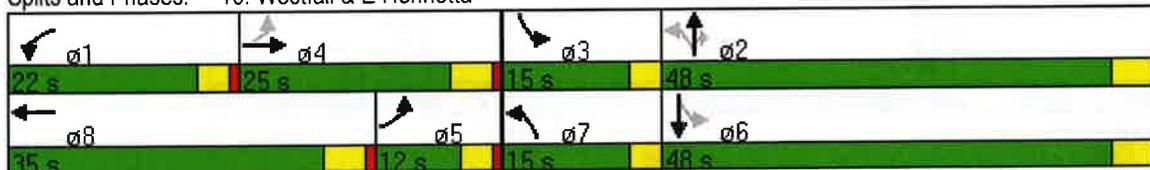


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	154	483	469	414	166	1215	274	295	1451
Turn Type	pm+pt		Prot		pm+pt		Perm	pm+pt	
Protected Phases	5	4	1	8	7	2		3	6
Permitted Phases	4				2		2	6	
Detector Phase	5	4	1	8	7	2	2	3	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	1.0	10.0	10.0	5.0	10.0
Minimum Split (s)	10.0	32.0	10.0	32.0	10.0	32.0	32.0	10.0	32.0
Total Split (s)	12.0	25.0	22.0	35.0	15.0	48.0	48.0	15.0	48.0
Total Split (%)	10.9%	22.7%	20.0%	31.8%	13.6%	43.6%	43.6%	13.6%	43.6%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0	-2.0	-1.0	0.0	-2.0
Total Lost Time (s)	4.0	3.0	4.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	21.0	22.0	18.0	28.8	55.4	45.0	44.0	58.2	46.6
Actuated g/C Ratio	0.19	0.20	0.16	0.26	0.50	0.41	0.40	0.53	0.42
v/c Ratio	0.69	1.04	0.93	0.74	0.77	0.93	0.39	1.24	1.15
Control Delay	64.3	90.5	69.6	37.4	48.8	29.0	4.3	164.6	100.7
Queue Delay	1.0	58.8	0.0	1.4	0.0	24.1	0.0	0.0	7.6
Total Delay	65.3	149.3	69.6	38.7	48.8	53.1	4.3	164.6	108.2
LOS	E	F	E	D	D	D	A	F	F
Approach Delay		133.6		51.9		44.6			117.3
Approach LOS		F		D		D			F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 8 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.24
 Intersection Signal Delay: 84.3
 Intersection Capacity Utilization 98.3%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service F

Splits and Phases: 10: Westfall & E Henrietta



Timings
11: South & E Henrietta

Lane Group	SBL	SET	NWT	NWR	ø1	ø3	ø5	ø6	ø7	ø8
Lane Configurations	↙↙	↕↕	↕	↗						
Volume (vph)	945	766	828	739						
Turn Type				custom						
Protected Phases	2	13	13	12	1	3	5	6	7	8
Permitted Phases		13		1						
Detector Phase	2	13	13	12						
Switch Phase										
Minimum Initial (s)	10.0				24.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	21.0	33.0	33.0	13.0
Total Split (s)	50.0	60.0	60.0	89.0	39.0	21.0	22.0	42.0	33.0	13.0
Total Split (%)	45.5%	54.5%	54.5%	80.9%	35%	19%	20%	38%	30%	12%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0						
Total Lost Time (s)	3.0	3.0	3.0	3.0						
Lead/Lag	Lag				Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None				C-Max	None	C-Max	None	None	None
Act Effect Green (s)	44.4	59.6	59.6	83.4						
Actuated g/C Ratio	0.40	0.54	0.54	0.76						
v/c Ratio	0.76	0.48	0.91	0.59						
Control Delay	18.6	5.0	31.1	6.7						
Queue Delay	31.8	0.0	0.7	0.2						
Total Delay	50.5	5.0	31.8	6.9						
LOS	D	A	C	A						
Approach Delay	50.5	5.0	20.1							
Approach LOS	D	A	C							

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 72 (65%), Referenced to phase 1:NWSE and 5:, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 25.3
 Intersection Capacity Utilization 77.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 11: South & E Henrietta



Timings
12: Crittenden Blvd & Mt. Hope



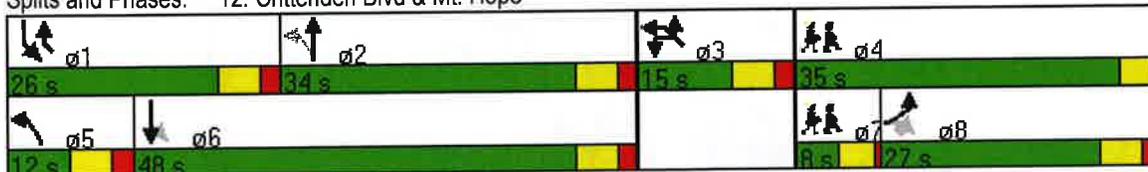
Lane Group	EBL	EBR	EBR2	NBL	NBT	SBL	SBT	NWL	NWR	ø4	ø7
Lane Configurations											
Volume (vph)	245	356	229	149	950	463	1097	179	519		
Turn Type		Perm	Perm	pm+pt		pm+pt			pt+ov		
Protected Phases	8			5	2	1	6	3	31	4	7
Permitted Phases		8	8	2		6					
Detector Phase	8	8	8	5	2	1	6	3	31		
Switch Phase											
Minimum Initial (s)	13.0	13.0	13.0	5.0	7.0	5.0	7.0	3.0		4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	12.0	27.0	12.0	27.0	12.0		8.0	8.0
Total Split (s)	27.0	27.0	27.0	12.0	34.0	26.0	48.0	15.0	41.0	35.0	8.0
Total Split (%)	24.5%	24.5%	24.5%	10.9%	30.9%	23.6%	43.6%	13.6%	37.3%	32%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		0.5	0.5
Lost Time Adjust (s)	-3.0	-3.0	-1.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lag				Lead
Lead-Lag Optimize?											Yes
Recall Mode	None	None	None	None	C-Max	None	C-Max	None		None	None
Act Effct Green (s)	32.0	32.0	30.0	40.0	31.0	57.0	45.0	12.0	35.0		
Actuated g/C Ratio	0.29	0.29	0.27	0.36	0.28	0.52	0.41	0.11	0.32		
v/c Ratio	0.53	0.86	0.59	0.78	1.09	1.17	0.90	1.09	0.93		
Control Delay	28.0	47.6	31.5	46.3	83.1	123.6	29.7	119.2	33.3		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0		
Total Delay	28.0	47.6	31.5	46.3	83.1	123.6	30.6	119.2	33.3		
LOS	C	D	C	D	F	F	C	F	C		
Approach Delay	37.4				78.2		57.0	56.2			
Approach LOS	D				E		E	E			

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 63 (57%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.17
 Intersection Signal Delay: 58.7
 Intersection Capacity Utilization 90.2%
 Analysis Period (min) 15

Intersection LOS: E
 ICU Level of Service E

Splits and Phases: 12: Crittenden Blvd & Mt. Hope



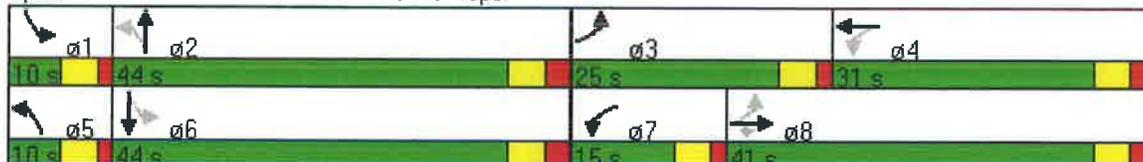


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↙	↑↑	↗	↙	↑↑	↙	↑↑	↙	↑↑
Volume (vph)	598	1183	237	273	736	190	1011	93	1052
Turn Type	pm+pt		Perm	pm+pt		pm+pt		pm+pt	
Protected Phases	3	8		7	4	5	2	1	6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	7	4	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	4.0	7.0	4.0	7.0
Minimum Split (s)	12.0	31.0	31.0	12.0	31.0	10.0	33.0	10.0	33.0
Total Split (s)	25.0	41.0	41.0	15.0	31.0	10.0	44.0	10.0	44.0
Total Split (%)	22.7%	37.3%	37.3%	13.6%	28.2%	9.1%	40.0%	9.1%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-1.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	53.0	38.0	36.0	40.0	28.0	48.0	41.0	48.0	41.0
Actuated g/C Ratio	0.48	0.35	0.33	0.36	0.25	0.44	0.37	0.44	0.37
v/c Ratio	1.57	1.07	0.44	1.15	0.95	1.16	1.26	0.57	1.17
Control Delay	285.3	72.0	10.3	135.8	34.7	136.0	146.5	29.7	115.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Total Delay	285.3	72.0	10.3	135.8	34.7	136.0	149.6	29.7	115.5
LOS	F	E	B	F	C	F	F	C	F
Approach Delay		127.9			61.2		148.0		110.0
Approach LOS		F			E		F		F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.57
 Intersection Signal Delay: 117.9
 Intersection LOS: F
 Intersection Capacity Utilization 117.3%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 13: Elmwood Ave & Mt. Hope



Timings
14: Lattimore & Mt. Hope



Lane Group	EBL	NBL	NBT	SBT
Lane Configurations	Y		↑↑	↑↑
Volume (vph)	121	42	1008	1425
Turn Type	Perm			
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	26.0	24.0	24.0	24.0
Total Split (s)	35.0	75.0	75.0	75.0
Total Split (%)	31.8%	68.2%	68.2%	68.2%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	C-Max	C-Max	C-Max
Act Effect Green (s)	24.4		79.6	79.6
Actuated g/C Ratio	0.22		0.72	0.72
v/c Ratio	0.74		0.58	0.63
Control Delay	44.9		11.3	22.7
Queue Delay	0.0		0.0	0.0
Total Delay	44.9		11.3	22.7
LOS	D		B	C
Approach Delay	44.9		11.3	22.7
Approach LOS	D		B	C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 20.6
 Intersection Capacity Utilization 81.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 14: Lattimore & Mt. Hope



Timings
15: Westfall & Mt. Hope



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↙	↘	↖	↗	↗	↙	↖
Volume (vph)	249	314	522	174	88	911	236	140	1409
Turn Type		Perm	Split		pm+pt		Perm	pm+pt	
Protected Phases	4		3	3	2	1		2	1
Permitted Phases		4			1		1	1	
Detector Phase	4	4	3	3	2	1	1	2	1
Switch Phase									
Minimum Initial (s)	6.0	6.0	4.0	4.0	5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	29.0	29.0	31.0	31.0	13.0	40.0	40.0	13.0	40.0
Total Split (s)	22.0	22.0	33.0	33.0	7.0	48.0	48.0	7.0	48.0
Total Split (%)	20.0%	20.0%	30.0%	30.0%	6.4%	43.6%	43.6%	6.4%	43.6%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	0.5	0.5	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	2.0	2.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	19.0	19.0	31.0	31.0	49.0	45.0	44.0	49.0	45.0
Actuated g/C Ratio	0.17	0.17	0.28	0.28	0.45	0.41	0.40	0.45	0.41
v/c Ratio	0.90	1.08	1.16	0.65	0.74	0.70	0.37	0.96	1.09
Control Delay	76.3	109.7	132.1	44.5	44.2	30.3	15.1	89.3	86.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	109.7	132.1	44.5	44.2	30.3	15.1	89.3	86.8
LOS	E	F	F	D	D	C	B	F	F
Approach Delay	94.6			100.1		28.4			87.0
Approach LOS	F			F		C			F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 73.3
 Intersection Capacity Utilization 100.1%
 Analysis Period (min) 15

Intersection LOS: E
 ICU Level of Service G

Splits and Phases: 15: Westfall & Mt. Hope



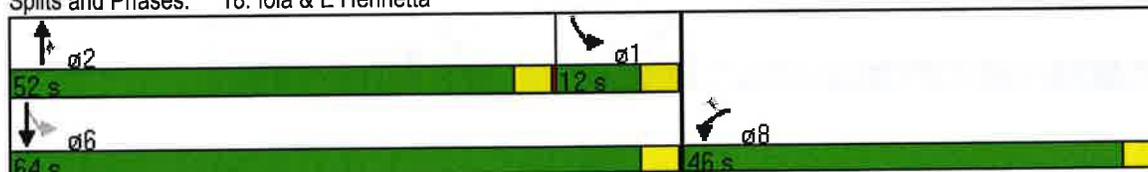
	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↖	↑↑	↗	↘	↑↑
Volume (vph)	194	221	1458	181	160	1975
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	46.0	46.0	52.0	52.0	12.0	64.0
Total Split (%)	41.8%	41.8%	47.3%	47.3%	10.9%	58.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead	Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)	19.0	19.0	71.0	71.0	83.0	83.0
Actuated g/C Ratio	0.17	0.17	0.65	0.65	0.75	0.75
v/c Ratio	0.71	0.60	0.71	0.19	0.73	0.82
Control Delay	54.9	20.8	15.9	3.2	27.7	12.2
Queue Delay	0.0	0.0	8.2	0.0	0.0	0.2
Total Delay	54.9	20.8	24.1	3.2	27.7	12.4
LOS	D	C	C	A	C	B
Approach Delay	36.8		21.8			13.6
Approach LOS	D		C			B

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 108 (98%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 19.1
 Intersection Capacity Utilization 72.0%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 18: lola & E Henrietta



Timings
21: Crittenden Blvd & Kendrick

	↙	↖	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations	↙	↖	↑↓	↘	↑↑
Volume (vph)	101	336	1336	212	713
Turn Type		Perm		pm+pt	
Protected Phases	3		2	1	2
Permitted Phases		3		2	
Detector Phase	3	3	2	1	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0
Total Split (s)	26.0	26.0	64.0	20.0	64.0
Total Split (%)	23.6%	23.6%	58.2%	18.2%	58.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead	Lag	Lead
Lead-Lag Optimize?			Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	C-Max
Act Effect Green (s)	15.1	15.1	68.9	82.9	68.9
Actuated g/C Ratio	0.14	0.14	0.63	0.75	0.63
v/c Ratio	0.46	0.86	0.79	0.79	0.36
Control Delay	51.4	38.7	9.7	51.0	16.4
Queue Delay	0.0	18.1	9.6	0.0	0.0
Total Delay	51.4	56.7	19.3	51.0	16.4
LOS	D	E	B	D	B
Approach Delay	55.5		19.3		24.4
Approach LOS	E		B		C

Intersection Summary

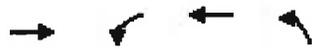
Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 26.4
 Intersection Capacity Utilization 71.0%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings
22: ELMWOOD AVENUE & Kendrick



Lane Group	EBT	WBL	WBT	NBL
Lane Configurations	↑↑	↖	↑↑	↗↘
Volume (vph)	735	276	1005	893
Turn Type		pm+pt		
Protected Phases	1	3	1 3	2
Permitted Phases		1 3		
Detector Phase	1	3	1 3	2
Switch Phase				
Minimum Initial (s)	15.0	4.0		10.0
Minimum Split (s)	27.0	10.0		26.0
Total Split (s)	28.0	44.0	72.0	38.0
Total Split (%)	25.5%	40.0%	65.5%	34.5%
Yellow Time (s)	4.0	3.5		4.0
All-Red Time (s)	1.0	1.5		1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lead			Lag
Lead-Lag Optimize?				
Recall Mode	C-Max	None		None
Act Effect Green (s)	38.9	66.0	69.0	35.0
Actuated g/C Ratio	0.35	0.60	0.63	0.32
v/c Ratio	1.20	0.61	0.50	1.57
Control Delay	125.6	11.1	3.9	286.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	125.6	11.1	3.9	286.5
LOS	F	B	A	F
Approach Delay	125.6		5.5	286.5
Approach LOS	F		A	F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 78 (71%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.57
 Intersection Signal Delay: 152.1
 Intersection LOS: F
 Intersection Capacity Utilization 116.5%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 22: ELMWOOD AVENUE & Kendrick



Timings
25: Lattimore & Kendrick



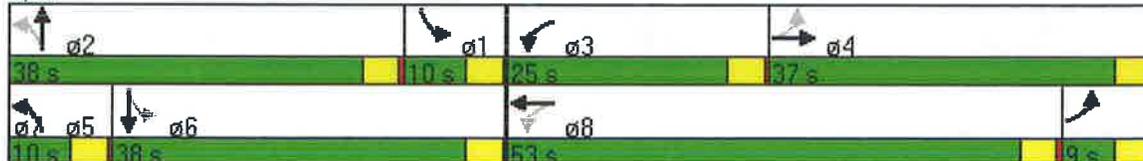
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	→	↗	←	↖	↑	↗	↑
Volume (vph)	28	1	244	1	124	919	96	1029
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	9.0	37.0	25.0	53.0	10.0	38.0	10.0	38.0
Total Split (%)	8.2%	33.6%	22.7%	48.2%	9.1%	34.5%	9.1%	34.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	12.3	7.3	23.0	20.3	61.9	61.9	57.2	57.2
Actuated g/C Ratio	0.11	0.07	0.21	0.18	0.56	0.56	0.52	0.52
v/c Ratio	0.15	0.59	0.68	0.59	0.49	0.59	0.37	0.61
Control Delay	45.5	19.0	50.5	11.2	23.4	18.2	11.4	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	45.5	19.0	50.5	11.2	23.4	18.2	11.4	8.4
LOS	D	B	D	B	C	B	B	A
Approach Delay		23.8		29.4		18.7		8.7
Approach LOS		C		C		B		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 16 (15%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 17.1
 Intersection Capacity Utilization 69.9%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 25: Lattimore & Kendrick





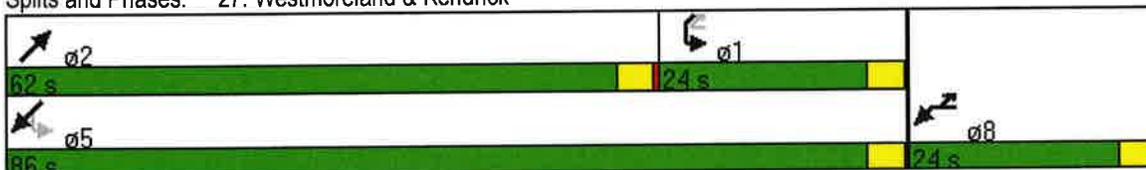
Lane Group	WBL	WBR	NET	SWL	SWT
Lane Configurations					
Volume (vph)	23	99	625	186	1448
Turn Type	custom		pm+pt		
Protected Phases	8	8	2	1	5
Permitted Phases	8	1 8		5	
Detector Phase	8	8	2	1	5
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0
Total Split (s)	24.0	24.0	62.0	24.0	86.0
Total Split (%)	21.8%	21.8%	56.4%	21.8%	78.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead	Lag	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	None	Min
Act Effect Green (s)	7.1	16.6	85.4	94.9	94.9
Actuated g/C Ratio	0.06	0.15	0.78	0.86	0.86
v/c Ratio	0.22	0.33	0.26	0.31	0.52
Control Delay	54.4	18.6	3.5	2.7	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	18.6	3.5	2.7	2.5
LOS	D	B	A	A	A
Approach Delay	25.3		3.5		2.6
Approach LOS	C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NET, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 4.0
 Intersection Capacity Utilization 50.0%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 27: Westmoreland & Kendrick



Intersection Sign configuration not allowed in HCM analysis.

Timings
91: Elmwood Ave & East Dr

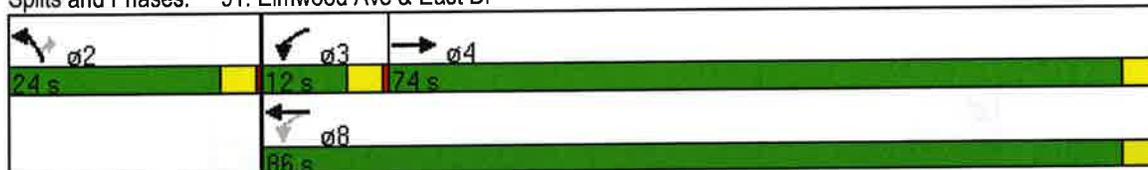


Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↖	↑↑	↖	↗
Volume (vph)	1638	123	1129	128	306
Turn Type		pm+pt			Perm
Protected Phases	4	3	8	2	
Permitted Phases		8			2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0	20.0
Total Split (s)	74.0	12.0	86.0	24.0	24.0
Total Split (%)	67.3%	10.9%	78.2%	21.8%	21.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	C-Max	Min	Min
Act Effct Green (s)	72.1	83.7	83.7	18.3	18.3
Actuated g/C Ratio	0.66	0.76	0.76	0.17	0.17
v/c Ratio	0.87	0.72	0.47	0.48	0.91
Control Delay	7.2	24.8	3.5	46.9	56.3
Queue Delay	0.1	0.0	0.0	0.0	0.0
Total Delay	7.2	24.8	3.5	46.9	56.3
LOS	A	C	A	D	E
Approach Delay	7.2		5.6	53.5	
Approach LOS	A		A	D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 102 (93%), Referenced to phase 8:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 12.4
 Intersection Capacity Utilization 75.8%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 91: Elmwood Ave & East Dr





Lane Group	NEL	NET	SWT	SWR
Lane Configurations				
Volume (vph)	269	643	1006	419
Turn Type	Prot			Perm
Protected Phases	5		6	
Permitted Phases		6		6
Detector Phase	5	6	6	6
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0
Total Split (s)	35.0	75.0	75.0	75.0
Total Split (%)	31.8%	68.2%	68.2%	68.2%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	C-Max
Act Effect Green (s)	23.3	78.7	78.7	78.7
Actuated g/C Ratio	0.21	0.72	0.72	0.72
v/c Ratio	0.78	0.52	0.82	0.38
Control Delay	54.8	9.8	13.1	2.0
Queue Delay	0.0	0.0	0.0	0.2
Total Delay	54.8	9.8	13.1	2.2
LOS	D	A	B	A
Approach Delay		23.1	9.9	
Approach LOS		C	A	

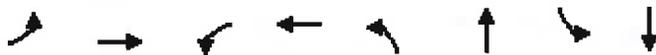
Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2: and 6:NESW, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 15.0
 Intersection Capacity Utilization 74.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 109: Kendrick &



Timings
117: Alpha Street & Kendrick

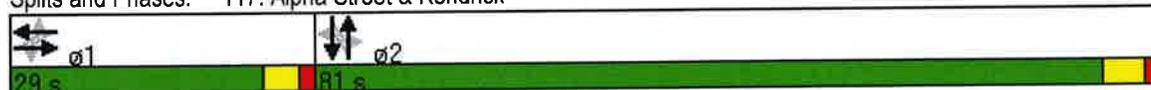


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	159	1	170	1	19	1184	57	706
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		1		1		2		2
Permitted Phases	1		1		2		2	
Detector Phase	1	1	1	1	2	2	2	2
Switch Phase								
Minimum Initial (s)	11.0	11.0	11.0	11.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	32.0	32.0	32.0	32.0
Total Split (s)	29.0	29.0	29.0	29.0	81.0	81.0	81.0	81.0
Total Split (%)	26.4%	26.4%	26.4%	26.4%	73.6%	73.6%	73.6%	73.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-3.0	0.0	0.0	0.0	-2.0	-3.0	0.0	-3.0
Total Lost Time (s)	2.0	5.0	5.0	5.0	4.0	3.0	6.0	3.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	Min	Min	Min	Min	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	26.3	23.3	23.3	23.3	77.7	78.7	75.7	78.7
Actuated g/C Ratio	0.24	0.21	0.21	0.21	0.71	0.72	0.69	0.72
v/c Ratio	0.93	0.32	0.79	0.54	0.06	0.60	0.33	0.36
Control Delay	92.2	8.1	65.8	26.8	2.4	3.3	9.1	5.8
Queue Delay	5.4	0.0	0.0	0.1	0.0	0.1	0.0	0.2
Total Delay	97.6	8.1	65.8	26.9	2.4	3.4	9.1	6.0
LOS	F	A	E	C	A	A	A	A
Approach Delay		57.3		44.7		3.3		6.2
Approach LOS		E		D		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 15.4
 Intersection Capacity Utilization 79.9%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 117: Alpha Street & Kendrick





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑	↘	
Volume (veh/h)	403	40	80	369	45	194
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	438	43	87	401	49	211
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	1254		938			
pX, platoon unblocked						
vC, conflicting volume			482		1035	241
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			482		1035	241
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		77	72
cM capacity (veh/h)			1077		209	760

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	292	189	87	401	260
Volume Left	0	0	87	0	49
Volume Right	0	43	0	0	211
cSH	1700	1700	1077	1700	508
Volume to Capacity	0.17	0.11	0.08	0.24	0.51
Queue Length 95th (ft)	0	0	7	0	72
Control Delay (s)	0.0	0.0	8.6	0.0	19.3
Lane LOS			A	C	
Approach Delay (s)	0.0		1.5	19.3	
Approach LOS				C	

Intersection Summary						
Average Delay			4.7			
Intersection Capacity Utilization			41.3%	ICU Level of Service	A	
Analysis Period (min)			15			

Timings
162: ELMWOOD AVENUE & South

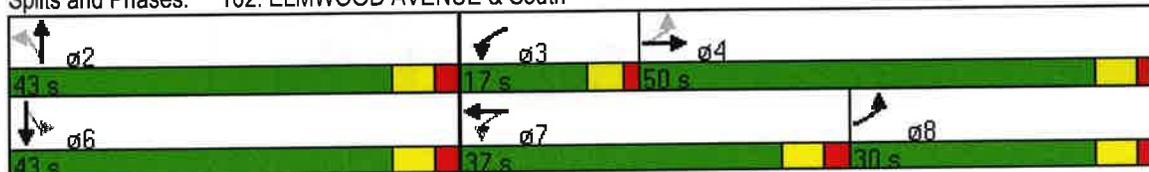


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↶	↷	↶	↷		↷		↷
Volume (vph)	251	1431	257	730	7	628	62	509
Turn Type	pm+pt		pm+pt		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	4		7		2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	30.0	50.0	17.0	37.0	43.0	43.0	43.0	43.0
Total Split (%)	27.3%	45.5%	15.5%	33.6%	39.1%	39.1%	39.1%	39.1%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	47.0	47.0	33.5	33.5		40.0		40.0
Actuated g/C Ratio	0.43	0.43	0.30	0.30		0.36		0.36
v/c Ratio	0.54	1.08	0.96	0.79		0.82		1.00
Control Delay	18.1	57.5	76.3	41.2		40.5		67.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	18.1	57.5	76.3	41.2		40.5		67.6
LOS	B	E	E	D		D		E
Approach Delay		51.8		50.0		40.5		67.6
Approach LOS		D		D		D		E

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 14 (13%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.08
 Intersection Signal Delay: 51.6
 Intersection Capacity Utilization 114.0%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service H

Splits and Phases: 162: ELMWOOD AVENUE & South



Timings
222: E Henrietta & I-390 NB On Ramp



Lane Group	EBR	WBR	NBL	NBT	SBT	SBR
Lane Configurations	↗	↗↗	↗↗	↑↑	↑↑	↗
Volume (vph)	300	481	616	1157	1682	519
Turn Type	custom	custom	custom			Perm
Protected Phases	1	3	1	2	2	
Permitted Phases	1	1	1		2	2
Detector Phase	1	3	1	2	2	2
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	27.0	20.0	27.0	68.0	68.0	68.0
Total Split (%)	23.5%	17.4%	23.5%	59.1%	59.1%	59.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag		Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	23.0	34.5	23.0	72.5	72.5	72.5
Actuated g/C Ratio	0.20	0.30	0.20	0.63	0.63	0.63
v/c Ratio	0.66	0.64	1.00	0.58	0.84	0.58
Control Delay	20.7	38.7	79.7	13.9	21.5	15.7
Queue Delay	0.0	0.0	0.0	0.0	56.2	3.2
Total Delay	20.7	38.7	79.7	13.9	77.7	18.9
LOS	C	D	E	B	E	B
Approach Delay				36.7	63.8	
Approach LOS				D	E	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 48.4
 Intersection Capacity Utilization 90.9%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 222: E Henrietta & I-390 NB On Ramp





Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↖	↑↑	↖	↗
Volume (vph)	1466	40	1249	31	46
Turn Type		pm+pt			Perm
Protected Phases	1	3	1 3	2	
Permitted Phases		1 3			2
Detector Phase	1	3	1 3	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	70.0	9.0	79.0	31.0	31.0
Total Split (%)	63.6%	8.2%	71.8%	28.2%	28.2%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effect Green (s)	67.0	73.0	76.0	28.0	28.0
Actuated g/C Ratio	0.61	0.66	0.69	0.25	0.25
v/c Ratio	0.78	0.27	0.57	0.08	0.12
Control Delay	4.8	13.3	4.0	31.9	9.5
Queue Delay	0.2	0.0	0.1	0.0	0.0
Total Delay	5.0	13.3	4.1	31.9	9.5
LOS	A	B	A	C	A
Approach Delay	5.0		4.3	18.4	
Approach LOS	A		A	B	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 5.1
 Intersection Capacity Utilization 53.5%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 393: ELMWOOD AVENUE & U of R



Timings
395: Crittenden Blvd & East Dr



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↖	↗	↕	↖	↗
Volume (vph)	78	624	274	201	157
Turn Type	Perm			Perm	
Protected Phases		1	1	2	
Permitted Phases	1				2
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	15.0	15.0
Total Split (s)	60.0	60.0	60.0	50.0	50.0
Total Split (%)	54.5%	54.5%	54.5%	45.5%	45.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	81.0	81.0	81.0	23.0	23.0
Actuated g/C Ratio	0.74	0.74	0.74	0.21	0.21
v/c Ratio	0.13	0.27	0.17	0.60	0.37
Control Delay	6.1	6.0	3.1	45.6	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	6.0	3.1	45.6	7.2
LOS	A	A	A	D	A
Approach Delay		6.0	3.1	28.7	
Approach LOS		A	A	C	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 10.8
 Intersection Capacity Utilization 38.3%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	61	1	228	1	10	1494	162	1871
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	14.0	39.0	14.0	39.0
Total Split (s)	32.0	32.0	32.0	32.0	14.0	64.0	14.0	64.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	12.7%	58.2%	12.7%	58.2%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	26.7	26.7	26.7	26.7	74.3	63.4	74.3	63.4
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.68	0.58	0.68	0.58
v/c Ratio	0.26	0.20	0.85	0.28	0.05	0.92	0.74	1.05
Control Delay	35.5	8.0	64.6	7.1	2.4	18.1	33.3	43.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	4.3	0.0	33.2
Total Delay	35.5	8.0	64.6	7.1	2.4	22.4	33.3	76.9
LOS	D	A	E	A	A	C	C	E
Approach Delay		19.8		44.6		22.3		73.5
Approach LOS		B		D		C		E

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 109 (99%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.05
 Intersection Signal Delay: 49.2
 Intersection Capacity Utilization 87.9%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 470: MCH & E Henrietta



Timings
500: Crittenden & E Henrietta



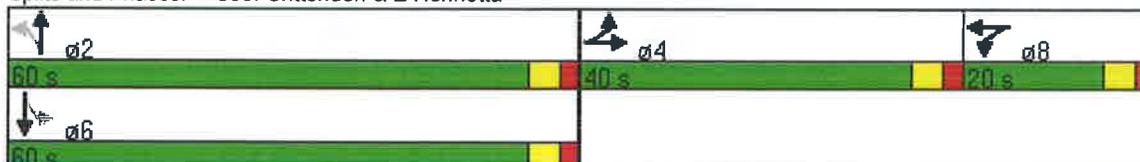
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	1015	1	1	94	1389	11	1497
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	40.0	40.0	20.0	60.0	60.0	60.0	60.0
Total Split (%)	33.3%	33.3%	16.7%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	37.0	37.0	9.1	69.4	69.4	69.4	69.4
Actuated g/C Ratio	0.31	0.31	0.08	0.58	0.58	0.58	0.58
v/c Ratio	1.35	1.24	0.15	1.60	0.76	0.17	1.11
Control Delay	204.0	157.6	41.6	357.8	23.1	21.8	83.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	22.5
Total Delay	204.0	157.6	41.6	357.8	23.1	21.8	106.2
LOS	F	F	D	F	C	C	F
Approach Delay		181.8	41.6		44.2		105.8
Approach LOS		F	D		D		F

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 105 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.60
 Intersection Signal Delay: 105.4
 Intersection Capacity Utilization 113.0%
 Analysis Period (min) 15

Intersection LOS: F
ICU Level of Service H

Splits and Phases: 500: Crittenden & E Henrietta



Timings
501: Southland Drive & West Henrietta Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕	↖	↗	↖	↗
Volume (vph)	11	1	30	1	7	1958	29	1576
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	75.0	75.0	13.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	68.2%	68.2%	11.8%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		12.8		12.8	84.5	84.5	91.2	91.2
Actuated g/C Ratio		0.12		0.12	0.77	0.77	0.83	0.83
v/c Ratio		0.23		0.66	0.05	0.81	0.16	0.61
Control Delay		24.9		28.2	5.4	12.1	6.4	2.0
Queue Delay		0.0		0.0	0.0	0.1	0.0	0.3
Total Delay		24.9		28.2	5.4	12.2	6.4	2.2
LOS		C		C	A	B	A	A
Approach Delay		24.9		28.2		12.1		2.3
Approach LOS		C		C		B		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 62 (56%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 8.8
 Intersection Capacity Utilization 73.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service D

Splits and Phases: 501: Southland Drive & West Henrietta Road



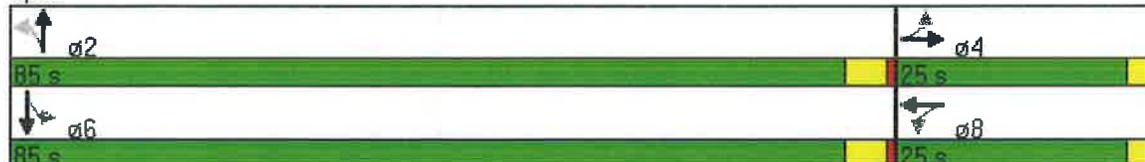


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Volume (vph)	4	1	17	1	7	1963	14	1595
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		7.2		7.2		101.4		101.4
Actuated g/C Ratio		0.07		0.07		0.92		0.92
v/c Ratio		0.08		0.34		0.71		0.61
Control Delay		38.6		38.6		7.0		1.2
Queue Delay		0.0		0.0		0.2		0.1
Total Delay		38.6		38.6		7.1		1.2
LOS		D		D		A		A
Approach Delay		38.6		38.6		7.1		1.2
Approach LOS		D		D		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 71 (65%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 4.9
 Intersection Capacity Utilization 69.3%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 502: Doncaster Road & West Henrietta Road



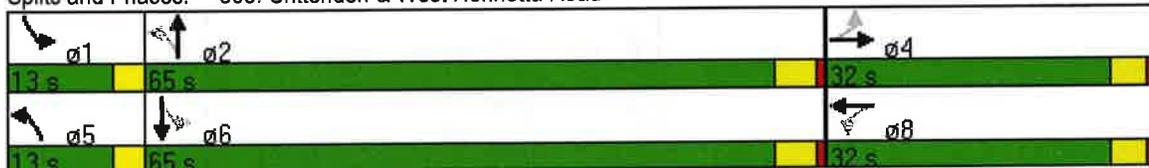


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕↕		↕↕	↖	↕↕	↖	↕↕
Volume (vph)	28	76	307	202	105	1663	236	1587
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	9.0	25.0	8.0	25.0
Total Split (s)	32.0	32.0	32.0	32.0	13.0	65.0	13.0	65.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	11.8%	59.1%	11.8%	59.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	0.0	1.0	0.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	0.0	-2.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?						C-Max	None	C-Max
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)		29.0		29.0	70.3	62.0	73.5	63.7
Actuated g/C Ratio		0.26		0.26	0.64	0.56	0.67	0.58
v/c Ratio		0.28		1.19	0.57	1.09	1.13	0.94
Control Delay		23.3		132.1	13.3	80.1	134.0	24.8
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.3		132.1	13.3	80.1	134.0	24.8
LOS		C		F	B	F	F	C
Approach Delay		23.3		132.1		76.6		38.0
Approach LOS		C		F		E		D

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.19
 Intersection Signal Delay: 68.5
 Intersection Capacity Utilization 108.5%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service G

Splits and Phases: 503: Crittenden & West Henrietta Road



Timings
504: BHTL & West Henrietta Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↵	↕↗	↵	↕↗	↵	↕↗	↵	↕↗
Volume (vph)	203	324	389	375	46	1617	167	1678
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	12.0	31.0	12.0	31.0	12.0	55.0	12.0	55.0
Total Split (%)	10.9%	28.2%	10.9%	28.2%	10.9%	50.0%	10.9%	50.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	34.2	25.2	34.2	25.2	61.5	53.3	65.4	57.6
Actuated g/C Ratio	0.31	0.23	0.31	0.23	0.56	0.48	0.59	0.52
v/c Ratio	1.06	0.54	1.57	0.78	0.26	1.21	0.79	1.14
Control Delay	108.0	37.7	298.6	40.4	12.9	129.8	35.8	91.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.0	37.7	298.6	40.4	12.9	129.8	35.8	91.7
LOS	F	D	F	D	B	F	D	F
Approach Delay		61.6		142.8		127.0		87.1
Approach LOS		E		F		F		F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 49 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.57
 Intersection Signal Delay: 107.9
 Intersection Capacity Utilization 107.4%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service G

Splits and Phases: 504: BHTL & West Henrietta Road





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	122	13	271	41	14	383
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	136	14	301	46	16	426
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	781	324			347	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	781	324			347	
iC, single (s)	6.4	6.2			4.1	
iC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	62	98			99	
cM capacity (veh/h)	359	717			1212	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	150	347	441
Volume Left	136	0	16
Volume Right	14	46	0
cSH	377	1700	1212
Volume to Capacity	0.40	0.20	0.01
Queue Length 95th (ft)	47	0	1
Control Delay (s)	20.7	0.0	0.4
Lane LOS	C		A
Approach Delay (s)	20.7	0.0	0.4
Approach LOS	C		

Intersection Summary			
Average Delay		3.5	
Intersection Capacity Utilization		45.7%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Volume (veh/h)	905	89	102	824	128	145
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1006	99	113	916	142	161
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	551					
pX, platoon unblocked			0.96		0.96	0.96
vC, conflicting volume			1104		1739	552
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1035		1693	462
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		0	69
cM capacity (veh/h)			644		67	527
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	670	434	419	610	142	161
Volume Left	0	0	113	0	142	0
Volume Right	0	99	0	0	0	161
cSH	1700	1700	644	1700	67	527
Volume to Capacity	0.39	0.26	0.18	0.36	2.13	0.31
Queue Length 95th (ft)	0	0	16	0	335	32
Control Delay (s)	0.0	0.0	5.0	0.0	656.0	14.8
Lane LOS			A		F	B
Approach Delay (s)	0.0		2.0		315.4	
Approach LOS					F	
Intersection Summary						
Average Delay			40.1			
Intersection Capacity Utilization			70.7%		ICU Level of Service C	
Analysis Period (min)			15			



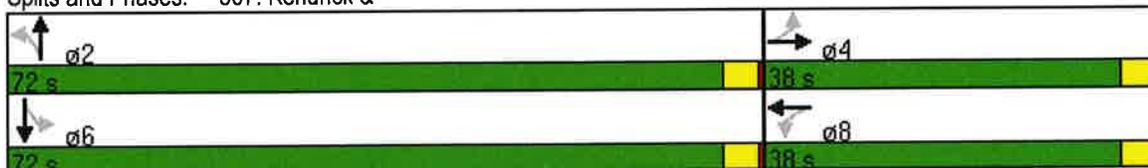
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	72	0	107	0	47	1125	57	911
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	38.0	38.0	38.0	38.0	72.0	72.0	72.0	72.0
Total Split (%)	34.5%	34.5%	34.5%	34.5%	65.5%	65.5%	65.5%	65.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	34.0	34.0	34.0	34.0	68.0	68.0	68.0	68.0
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.62	0.62	0.62	0.62
v/c Ratio	0.20	0.21	0.32	0.19	0.21	0.60	0.39	0.48
Control Delay	29.8	5.4	32.0	10.8	7.1	11.0	14.3	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.5
Total Delay	29.8	5.4	32.0	10.8	7.1	12.0	14.3	7.6
LOS	C	A	C	B	A	B	B	A
Approach Delay		15.2		22.3		11.8		8.0
Approach LOS		B		C		B		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Pretimed
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 11.4
 Intersection Capacity Utilization 58.8%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 507: Kendrick &



Intersection									
Intersection Delay (sec/veh)	24.8								
Intersection LOS	C								
Approach	EB		WB		NB		SB		
Entry Lanes	2		2		1		2		
Conflicting Circle Lanes	2		2		2		2		
Adjusted Approach Flow (vph)	354		898		648		1141		
Demand Flow Rate (pc/h)	362		916		661		1164		
Vehicles Circulating (pc/h)	1091		446		1118		345		
Vehicles Exiting (pc/h)	418		988		335		427		
Follow-Up Headway (s)	3.186		3.186		3.186		3.186		
Ped Vol. Crossing Leg (#/hr)	0		0		0		0		
Ped Capacity Adjustment	1.000		1.000		1.000		1.000		
Approach Delay (sec/veh)	12.8		3.4		9.9		53.8		
Approach LOS	B		A		A		F		
Lane	Left	Right	Left	Bypass	Left	Bypass	Left	Right	
Designated moves	LT	TR	LT	R	LT	R	LT	R	
Assumed Moves	LT	TR	LT	R	LT	R	LT	R	
Right Turn Channelized				Free		Free			
Lane Utilization	0.470	0.530	1.000		1.000		0.787	0.213	
Critical Headway (s)	4.293	4.113	4.293		4.113		4.293	4.113	
Entry Flow Rate (pc/h)	170	192	326	590	316	345	916	248	
Capacity, Entry Lane (pc/h)	499	526	809	1938	517	1938	872	888	
Entry HV Adjustment Factor	0.980	0.978	0.982	0.980	0.982	0.980	0.980	0.980	
Flow Rate, Entry (vph)	167	188	320	578	310	338	898	243	
Capacity, Entry (vph)	489	515	794	1900	507	1900	855	870	
Volume to Capacity Ratio	0.341	0.365	0.403	0.304	0.612	0.178	1.050	0.279	
Control Delay (sec/veh)	12.8	12.8	9.6	0.0	20.7	0.0	66.5	7.1	
Level of Service	B	B	A	A	C	A	F	A	
95th-Percentile Queue (veh)	1	2	2	1	4	1	21	1	

AM Peak Hour

Build Conditions with Mitigation 20-Year

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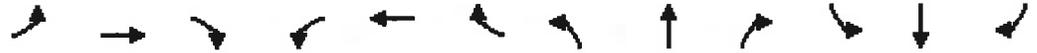
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HCM Unsignalized Intersection Capacity Analysis

7/11/2013

1: East River Road & Kendrick

University of Rochester, October 2011 Revision



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized						Yes						
Volume (veh/h)	242	166	31	219	270	1545	10	83	116	247	57	92
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	269	184	34	243	300	1717	11	92	129	274	63	102
Approach Volume (veh/h)		488			543			232			440	
Crossing Volume (veh/h)		581			372			728			554	
High Capacity (veh/h)		875			1033			777			894	
High v/c (veh/h)		0.56			0.53			0.30			0.49	
Low Capacity (veh/h)		702			844			617			719	
Low v/c (veh/h)		0.69			0.64			0.38			0.61	
Intersection Summary												
Maximum v/c High			0.56									
Maximum v/c Low			0.69									
Intersection Capacity Utilization			116.3%			ICU Level of Service					H	

Timings
2: East River Road & I-390 S On Ramp

7/11/2013
University of Rochester, October 2011 Revision

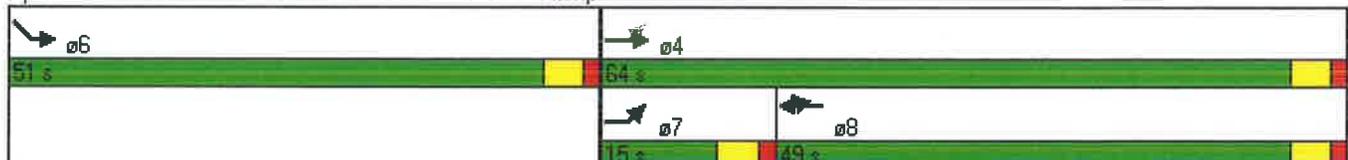


Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	253	277	1385	118	1367	575
Turn Type	pm+pt			Prot		Free
Protected Phases	7	4	8	8	6	
Permitted Phases	4					Free
Detector Phase	7	4	8	8	6	
Switch Phase						
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	15.0	25.0	25.0	25.0	25.0	
Total Split (s)	15.0	64.0	49.0	49.0	51.0	0.0
Total Split (%)	13.0%	55.7%	42.6%	42.6%	44.3%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	5.0	3.0	3.0	4.0	3.0	2.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Recall Mode	None	Min	Min	Min	C-Min	
Act Effct Green (s)	59.0	61.0	46.0	45.0	48.0	115.0
Actuated g/C Ratio	0.51	0.53	0.40	0.39	0.42	1.00
v/c Ratio	0.75	0.39	1.09	0.21	1.06	0.40
Control Delay	45.8	15.8	76.2	14.2	74.7	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.8	15.8	76.2	14.2	74.7	0.8
LOS	D	B	E	B	E	A
Approach Delay		23.4	71.4		52.8	
Approach LOS		C	E		D	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 4 (3%), Referenced to phase 6:SEL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.09
 Intersection Signal Delay: 55.9
 Intersection Capacity Utilization 97.3%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service F

Splits and Phases: 2: East River Road & I-390 S On Ramp



Timings
3: College Town & Mt. Hope

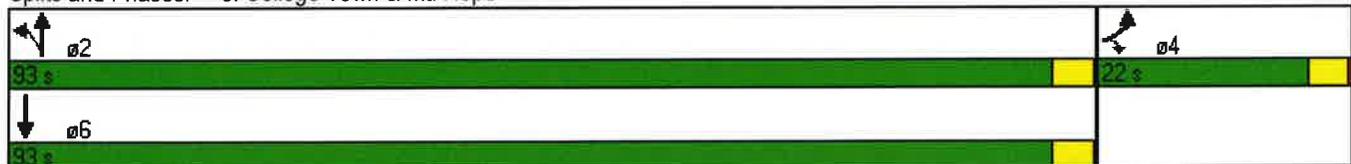


Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	15	41	18	1175	1467
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	22.0	22.0	93.0	93.0	93.0
Total Split (%)	19.1%	19.1%	80.9%	80.9%	80.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	6.8	6.8	102.9	102.9	102.9
Actuated g/C Ratio	0.06	0.06	0.89	0.89	0.89
v/c Ratio	0.16	0.34	0.09	0.41	0.52
Control Delay	54.1	21.4	0.9	1.2	1.1
Queue Delay	0.0	0.9	0.0	0.4	0.3
Total Delay	54.1	22.3	0.9	1.6	1.5
LOS	D	C	A	A	A
Approach Delay	30.9			1.6	1.5
Approach LOS	C			A	A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 2.1
 Intersection Capacity Utilization 50.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: College Town & Mt. Hope



HCM Unsignalized Intersection Capacity Analysis
 5: I-390 NB On Ramp & West Henrietta Road

7/11/2013
 University of Rochester, October 2011 Revision



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↑↑↑	↑↑	↗
Volume (veh/h)	0	0	0	1879	901	200
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	2088	1001	222
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)				267	774	
pX, platoon unblocked	0.89	0.78	0.78			
vC, conflicting volume	1697	501	1223			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	74	0	726			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	820	847	682			

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	696	696	696	501	501	222
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	222
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.41	0.41	0.41	0.29	0.29	0.13
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			39.6%	ICU Level of Service		A
Analysis Period (min)			15			



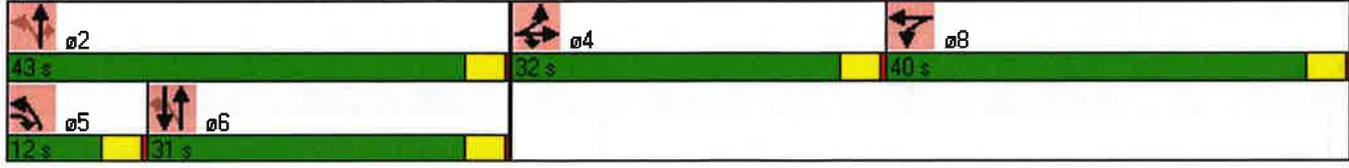
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Volume (vph)	543	73	867	119	1350	185	1160	77	802	99
Turn Type	Split		pt+ov	custom		pm+pt		custom		Perm
Protected Phases	4	4	4 5	8	8	5	2 6		6	
Permitted Phases				8		2 6	6	2		6
Detector Phase	4	4	4 5	8	8	5	2 6	2	6	6
Switch Phase										
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	20.0	20.0		8.0	8.0	8.0		20.0	20.0	20.0
Total Split (s)	32.0	32.0	44.0	40.0	40.0	12.0	74.0	43.0	31.0	31.0
Total Split (%)	27.8%	27.8%	38.3%	34.8%	34.8%	10.4%	64.3%	37.4%	27.0%	27.0%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5		0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.5	-1.0
Total Lost Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	1.5	3.0
Lead/Lag						Lead			Lag	Lag
Lead-Lag Optimize?						Yes			Yes	Yes
Recall Mode	None	None		None	None	None		C-Min	C-Min	C-Min
Act Effect Green (s)	30.0	30.0	40.0	38.0	38.0	41.0	41.0	40.0	29.5	28.0
Actuated g/C Ratio	0.26	0.26	0.35	0.33	0.33	0.36	0.36	0.35	0.26	0.24
v/c Ratio	0.98	0.74	0.64	0.23	1.02	0.94	0.71	0.15	0.98	0.24
Control Delay	60.5	12.1	9.6	24.9	60.1	77.9	34.5	14.6	59.2	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.5	12.1	9.6	24.9	60.1	77.9	34.5	14.6	59.2	12.4
LOS	E	B	A	C	E	E	C	B	E	B
Approach Delay		23.4			57.6		39.1		54.1	
Approach LOS		C			E		D		D	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 39 (34%), Referenced to phase 2:NBTL and 6:NBSB, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 42.9
 Intersection Capacity Utilization 98.0%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 6: East River Road & West Henrietta Road



Timings
8: I-390 SB Ramp & E Henrietta

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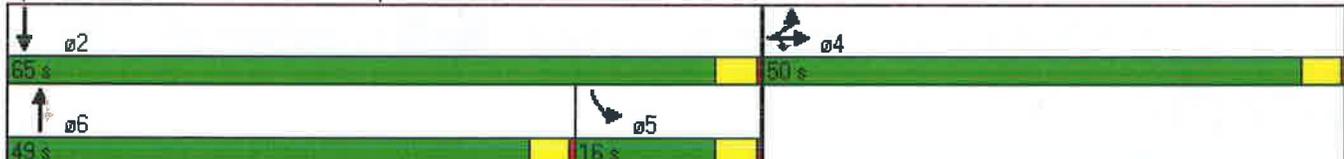


Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Volume (vph)	574	98	1054	1050	260	337	1705
Turn Type	Split		Perm		Perm	Prot	
Protected Phases	4	4		6		5	2
Permitted Phases			4		6		
Detector Phase	4	4	4	6	6	5	2
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	50.0	50.0	50.0	49.0	49.0	16.0	65.0
Total Split (%)	43.5%	43.5%	43.5%	42.6%	42.6%	13.9%	56.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	1.5	1.5	1.5	3.0	3.0	3.0	3.0
Lead/Lag				Lead	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	48.5	48.5	48.5	44.1	44.1	14.9	62.0
Actuated g/C Ratio	0.42	0.42	0.42	0.38	0.38	0.13	0.54
v/c Ratio	0.69	0.96dr	0.95	0.86	0.39	0.84	0.99
Control Delay	33.3	31.3	59.3	36.5	5.5	46.2	26.6
Queue Delay	0.0	0.2	12.8	1.9	0.0	0.0	0.0
Total Delay	33.3	31.5	72.1	38.4	5.5	46.2	26.6
LOS	C	C	E	D	A	D	C
Approach Delay		44.3		31.9			29.8
Approach LOS		D		C			C

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 96 (83%), Referenced to phase 2:SBT and 6:NBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.99
 Intersection Signal Delay: 35.3
 Intersection LOS: D
 Intersection Capacity Utilization 97.3%
 ICU Level of Service F
 Analysis Period (min) 15
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: I-390 SB Ramp & E Henrietta





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	105	392	261	412	272	1319	547	229	1104
Turn Type	pm+pt		Prot		pm+pt		Perm	pm+pt	
Protected Phases	5	4	1	8	7	2		3	6
Permitted Phases	4				2		2	6	
Detector Phase	5	4	1	8	7	2	2	3	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	7.0	7.0	5.0	7.0
Minimum Split (s)	10.0	29.0	10.0	29.0	10.0	32.0	32.0	8.0	32.0
Total Split (s)	14.0	35.0	14.0	35.0	19.0	47.0	47.0	19.0	47.0
Total Split (%)	12.2%	30.4%	12.2%	30.4%	16.5%	40.9%	40.9%	16.5%	40.9%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0	-2.0	-1.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	37.2	27.9	11.0	29.6	65.5	49.5	48.5	61.9	47.3
Actuated g/C Ratio	0.32	0.24	0.10	0.26	0.57	0.43	0.42	0.54	0.41
v/c Ratio	0.55	0.64	0.88	0.77	0.93	0.96	0.71	0.87	0.95
Control Delay	31.5	38.4	79.3	40.0	60.0	43.6	19.0	53.0	47.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	35.6	1.1	0.0	0.0
Total Delay	31.5	38.4	79.3	40.0	60.0	79.2	20.1	53.0	47.7
LOS	C	D	E	D	E	E	C	D	D
Approach Delay		37.2		51.4		61.6			48.6
Approach LOS		D		D		E			D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 53.2
 Intersection Capacity Utilization 87.7%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 10: Westfall & E Henrietta

ø1	ø4	ø3	ø2
14 s	35 s	19 s	47 s
ø5	ø8	ø7	ø6
14 s	35 s	19 s	47 s

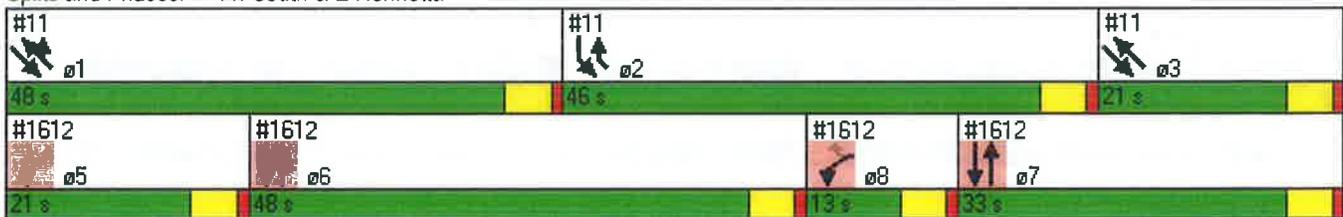
Timings
11: South & E Henrietta

Lane Group	SBL	SET	NWT	NWR	ø1	ø3	ø5	ø6	ø7	ø8
Lane Configurations										
Volume (vph)	699	571	682	824						
Turn Type				custom						
Protected Phases	2	13	13	12	1	3	5	6	7	8
Permitted Phases		13		12						
Detector Phase	2	13	13	12						
Switch Phase										
Minimum Initial (s)	10.0				24.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	21.0	33.0	33.0	13.0
Total Split (s)	46.0	69.0	69.0	94.0	48.0	21.0	21.0	48.0	33.0	13.0
Total Split (%)	40.0%	60.0%	60.0%	81.7%	42%	18%	18%	42%	29%	11%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0						
Total Lost Time (s)	3.0	3.0	3.0	3.0						
Lead/Lag	Lag				Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None				C-Max	None	C-Max	None	None	None
Act Effct Green (s)	38.2	70.8	70.8	87.4						
Actuated g/C Ratio	0.33	0.62	0.62	0.76						
v/c Ratio	0.68	0.31	0.66	0.64						
Control Delay	50.2	2.6	18.9	5.8						
Queue Delay	4.8	0.0	0.1	0.8						
Total Delay	54.9	2.6	19.0	6.6						
LOS	D	A	B	A						
Approach Delay	54.9	2.6	12.2							
Approach LOS	D	A	B							

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NWSE and 5:, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 21.0
 Intersection Capacity Utilization 62.5%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 11: South & E Henrietta



Timings

12: Crittenden Blvd & Mt. Hope

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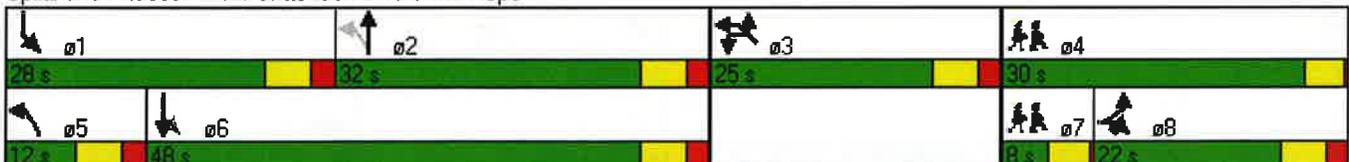
Lane Group	EBL	EBR	EBR2	NBL	NBT	SBL	SBT	NWL	NWR	ø4	ø7
Lane Configurations											
Volume (vph)	116	221	138	191	611	396	951	276	433		
Turn Type		Prot	Perm	pm+pt		pm+pt			Prot		
Protected Phases	8	8		5	2	1	6	3	3	4	7
Permitted Phases			8	2		6					
Detector Phase	8	8	8	5	2	1	6	3	3		
Switch Phase											
Minimum Initial (s)	13.0	13.0	13.0	5.0	7.0	5.0	7.0	6.0	6.0	4.0	4.0
Minimum Split (s)	19.0	19.0	19.0	12.0	27.0	12.0	27.0	18.0	18.0	25.0	8.0
Total Split (s)	22.0	22.0	22.0	12.0	32.0	28.0	48.0	25.0	25.0	30.0	8.0
Total Split (%)	19.1%	19.1%	19.1%	10.4%	27.8%	24.3%	41.7%	21.7%	21.7%	26%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.5	0.5
Lost Time Adjust (s)	-3.0	-3.0	-1.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes								Yes
Recall Mode	None	None	None	None	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	25.9	25.9	23.9	39.4	29.3	58.1	45.0	22.0	22.0		
Actuated g/C Ratio	0.23	0.23	0.21	0.34	0.25	0.51	0.39	0.19	0.19		
v/c Ratio	0.32	0.69	0.47	0.96	0.77	0.95	0.98	0.91	0.71		
Control Delay	41.4	53.4	47.2	81.6	60.1	53.2	52.8	73.9	16.6		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0		
Total Delay	41.4	53.4	47.2	81.6	60.1	53.2	57.9	73.9	16.6		
LOS	D	D	D	F	E	D	E	E	B		
Approach Delay	48.7				65.1		56.7	38.9			
Approach LOS	D				E		E	D			

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 99 (86%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 54.0
 Intersection Capacity Utilization 83.9%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 12: Crittenden Blvd & Mt. Hope



Timings
13: Elmwood Ave & Mt. Hope

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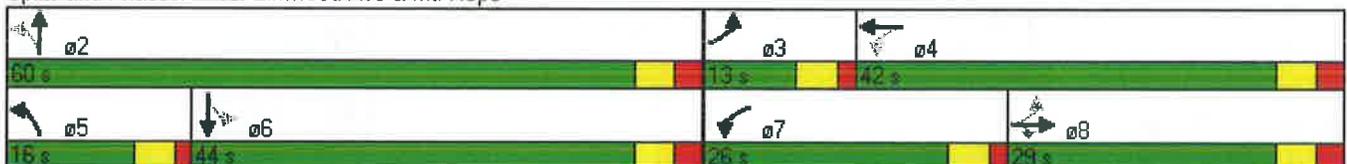
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	268	719	207	392	1188	214	818	45	873
Turn Type	pm+pt		Perm	pm+pt		pm+pt		Perm	
Protected Phases	3	8		7	4	5	2		6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	7	4	5	2	6	6
Switch Phase									
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	4.0	7.0	7.0	7.0
Minimum Split (s)	12.0	31.0	31.0	12.0	31.0	10.0	33.0	33.0	33.0
Total Split (s)	13.0	29.0	29.0	26.0	42.0	16.0	60.0	44.0	44.0
Total Split (%)	11.3%	25.2%	25.2%	22.6%	36.5%	13.9%	52.2%	38.3%	38.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	2.5	1.5	2.5	1.5	2.5	2.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-1.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	4.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead		Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	36.0	26.0	24.0	52.0	39.0	57.0	57.0	40.0	41.0
Actuated g/C Ratio	0.31	0.23	0.21	0.45	0.34	0.50	0.50	0.35	0.36
v/c Ratio	1.35	1.00	0.45	1.04	1.12	0.89	0.63	0.37	1.26
Control Delay	209.2	66.0	12.3	67.9	78.9	77.9	12.3	37.8	154.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	209.2	66.0	12.3	67.9	78.9	77.9	12.5	37.8	154.7
LOS	F	E	B	E	E	E	B	D	F
Approach Delay		88.9			76.2		24.3		151.2
Approach LOS		F			E		C		F

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 10 (9%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.35
 Intersection Signal Delay: 88.3
 Intersection Capacity Utilization 116.4%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service H

Splits and Phases: 13: Elmwood Ave & Mt. Hope



Timings
14: Lattimore & Mt. Hope



Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	11	146	826	979
Turn Type	Perm			
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	26.0	24.0	24.0	24.0
Total Split (s)	26.0	89.0	89.0	89.0
Total Split (%)	22.6%	77.4%	77.4%	77.4%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	C-Max	C-Max	C-Max
Act Effct Green (s)	9.2		99.8	99.8
Actuated g/C Ratio	0.08		0.87	0.87
v/c Ratio	0.29		0.59	0.39
Control Delay	25.7		20.5	0.2
Queue Delay	0.0		0.0	0.0
Total Delay	25.7		20.5	0.2
LOS	C		C	A
Approach Delay	25.7		20.5	0.2
Approach LOS	C		C	A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 10.2
 Intersection Capacity Utilization 71.9%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 14: Lattimore & Mt. Hope



Timings
15: Westfall & Mt. Hope



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↗	↖	↕	↖	↕	↗	↖	↕
Volume (vph)	11	167	67	220	335	122	852	505	126	814
Turn Type	Perm		custom	Prot		custom		Perm	custom	
Protected Phases		4	4	3	3 4	2	1		2	1
Permitted Phases	4		4			2		1	2	
Detector Phase	4	4	4	3	3 4	2	1	1	2	1
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	5.0		5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	32.0	32.0	32.0	32.0		13.0	40.0	40.0	13.0	40.0
Total Split (s)	24.0	24.0	24.0	37.0	61.0	19.0	35.0	35.0	19.0	35.0
Total Split (%)	20.9%	20.9%	20.9%	32.2%	53.0%	16.5%	30.4%	30.4%	16.5%	30.4%
Yellow Time (s)	4.0	4.0	4.0	3.0		3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	1.0	2.0		2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None	None	None	None		None	C-Min	C-Min	None	C-Min
Act Effct Green (s)		21.0	21.0	35.9	35.9	14.1	32.0	31.0	14.1	32.0
Actuated g/C Ratio		0.18	0.18	0.31	0.31	0.12	0.28	0.27	0.12	0.28
v/c Ratio		0.61	0.23	0.42	0.96	0.63	0.96	0.93	0.65	0.92
Control Delay		52.2	21.9	32.5	55.7	46.0	49.3	35.2	40.9	39.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		52.2	21.9	32.5	55.7	46.0	49.3	35.2	40.9	39.6
LOS		D	C	C	E	D	D	D	D	D
Approach Delay		43.9			48.8		44.2			39.8
Approach LOS		D			D		D			D

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 34 (30%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 43.9
 Intersection Capacity Utilization 71.6%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service C

Splits and Phases: 15: Westfall & Mt. Hope



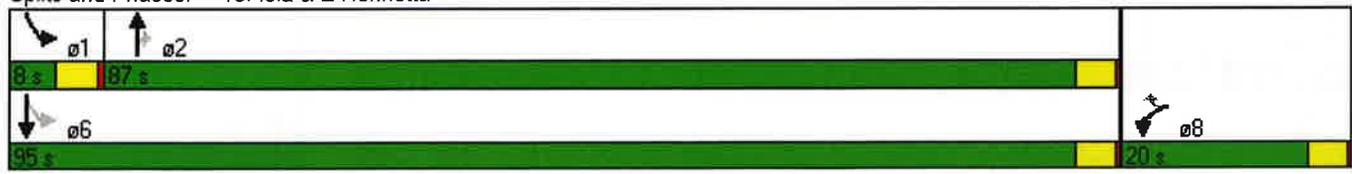
	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↖	↑↑	↗	↘	↑↑
Volume (vph)	114	30	2209	226	107	1284
Turn Type	Perm			Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	87.0	87.0	8.0	95.0
Total Split (%)	17.4%	17.4%	75.7%	75.7%	7.0%	82.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)	13.0	13.0	83.5	83.5	94.0	94.0
Actuated g/C Ratio	0.11	0.11	0.73	0.73	0.82	0.82
v/c Ratio	0.64	0.16	0.95	0.21	0.72	0.49
Control Delay	62.8	16.3	19.8	0.3	41.9	8.2
Queue Delay	0.0	0.0	31.9	0.0	0.0	0.9
Total Delay	62.8	16.3	51.8	0.3	41.9	9.0
LOS	E	B	D	A	D	A
Approach Delay	53.2		47.0		11.6	
Approach LOS	D		D		B	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 83 (72%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 34.8
 Intersection Capacity Utilization 83.3%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 18: Iola & E Henrietta



Timings
21: Crittenden Blvd & Kendrick

	↙	↗	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations	↙	↗	↑↓	↘	↑↑
Volume (vph)	91	162	433	199	1606
Turn Type		Perm		pm+pt	
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0
Total Split (s)	24.0	24.0	75.0	16.0	91.0
Total Split (%)	20.9%	20.9%	65.2%	13.9%	79.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	11.9	11.9	82.6	95.1	95.1
Actuated g/C Ratio	0.10	0.10	0.72	0.83	0.83
v/c Ratio	0.55	0.55	0.24	0.33	0.61
Control Delay	58.0	13.4	3.7	2.0	5.5
Queue Delay	0.0	0.0	0.3	0.0	5.0
Total Delay	58.0	13.4	4.0	2.0	10.4
LOS	E	B	A	A	B
Approach Delay	29.4		4.0		9.5
Approach LOS	C		A		A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 10.3
 Intersection Capacity Utilization 56.1%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings

22: ELMWOOD AVENUE & Kendrick

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑↑	↑↑	↑
Volume (vph)	748	912	893	509	303	287
Turn Type	custom		Prot		pt+ov	
Protected Phases	1	1 2	3	1 3	2	2 3
Permitted Phases	1 2					
Detector Phase	1	1 2	3	1 3	2	2 3
Switch Phase						
Minimum Initial (s)	15.0		4.0		10.0	
Minimum Split (s)	34.0		10.0		26.0	
Total Split (s)	53.0	79.0	36.0	89.0	26.0	62.0
Total Split (%)	46.1%	68.7%	31.3%	77.4%	22.6%	53.9%
Yellow Time (s)	4.0		3.5		4.0	
All-Red Time (s)	1.0		1.5		1.5	
Lost Time Adjust (s)	-2.0	-1.0	-2.0	-2.0	-2.5	-2.5
Total Lost Time (s)	3.0	4.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead			Lag		
Lead-Lag Optimize?						
Recall Mode	C-Max		None		None	
Act Effct Green (s)	50.0	75.0	33.0	86.0	23.0	59.0
Actuated g/C Ratio	0.43	0.65	0.29	0.75	0.20	0.51
v/c Ratio	0.54	0.98	1.01	0.21	0.49	0.37
Control Delay	25.6	43.4	62.3	8.2	38.2	20.6
Queue Delay	0.0	31.6	6.5	0.0	0.0	0.0
Total Delay	25.6	75.0	68.8	8.2	38.2	20.6
LOS	C	E	E	A	D	C
Approach Delay	52.7			46.8	29.7	
Approach LOS	D			D	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 110 (96%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 46.7
 Intersection Capacity Utilization 88.6%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 22: ELMWOOD AVENUE & Kendrick



Timings
25: Lattimore & Kendrick

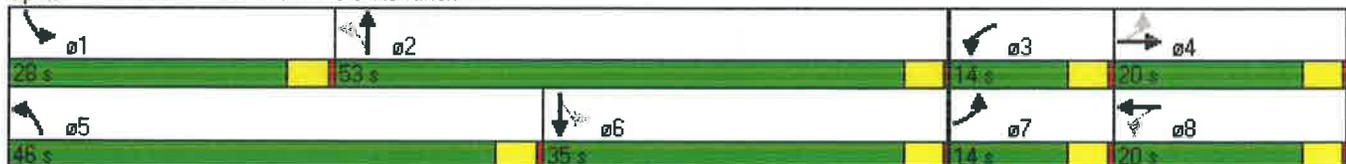


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	33	1	73	1	527	833	140	699
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	14.0	20.0	14.0	20.0	46.0	53.0	28.0	35.0
Total Split (%)	12.2%	17.4%	12.2%	17.4%	40.0%	46.1%	24.3%	30.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	11.8	6.5	14.1	8.0	93.4	78.4	65.4	54.3
Actuated g/C Ratio	0.10	0.06	0.12	0.07	0.81	0.68	0.57	0.47
v/c Ratio	0.20	0.31	0.42	0.33	0.82	0.52	0.41	0.59
Control Delay	43.1	23.0	49.3	20.0	27.7	15.7	11.2	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.6	0.1	0.0	0.1
Total Delay	43.1	23.0	49.3	20.0	28.3	15.8	11.2	32.0
LOS	D	C	D	B	C	B	B	C
Approach Delay		32.6		37.5		19.8		29.1
Approach LOS		C		D		B		C

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 24.2
 Intersection Capacity Utilization 75.0%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 25: Lattimore & Kendrick



Timings

7/11/2013

27: Westmoreland & Kendrick

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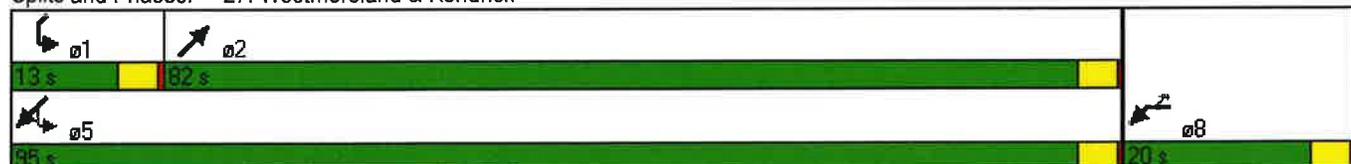


Lane Group	WBL	WBR	NET	SWL	SWT
Lane Configurations					
Volume (vph)	13	172	1595	92	483
Turn Type	Perm		pm+pt		
Protected Phases	8		2	1	5
Permitted Phases	8	8		5	
Detector Phase	8	8	2	1	5
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	82.0	13.0	95.0
Total Split (%)	17.4%	17.4%	71.3%	11.3%	82.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	C-Max	None	Min
Act Effct Green (s)	9.6	9.6	86.5	97.4	97.4
Actuated g/C Ratio	0.08	0.08	0.75	0.85	0.85
v/c Ratio	0.10	0.71	0.67	0.43	0.18
Control Delay	40.8	35.1	6.3	27.6	0.4
Queue Delay	0.0	0.0	5.4	0.0	0.0
Total Delay	40.8	35.1	11.7	27.6	0.4
LOS	D	D	B	C	A
Approach Delay	35.5		11.7		4.8
Approach LOS	D		B		A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NET, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 11.9
 Intersection LOS: B
 Intersection Capacity Utilization 63.9%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 27: Westmoreland & Kendrick



Intersection Sign configuration not allowed in HCM analysis.

Timings

7/11/2013

91: Elmwood Ave & East Dr

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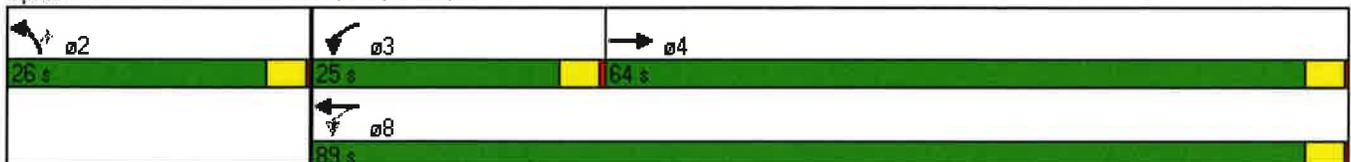
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↖	↑↑	↖	↗
Volume (vph)	944	286	1647	104	191
Turn Type		pm+pt			Perm
Protected Phases	4	3	8	2	
Permitted Phases		8			2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0	20.0
Total Split (s)	64.0	25.0	89.0	26.0	26.0
Total Split (%)	55.7%	21.7%	77.4%	22.6%	22.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	C-Min	C-Min
Act Effect Green (s)	60.5	84.0	84.0	23.0	23.0
Actuated g/C Ratio	0.53	0.73	0.73	0.20	0.20
v/c Ratio	0.62	0.71	0.71	0.33	0.44
Control Delay	6.0	6.6	10.5	44.5	8.7
Queue Delay	0.1	0.0	0.0	0.0	0.0
Total Delay	6.0	6.6	10.5	44.5	8.7
LOS	A	A	B	D	A
Approach Delay	6.0		9.9	21.4	
Approach LOS	A		A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 86 (75%), Referenced to phase 2:NBL and 6:, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 9.7
 Intersection Capacity Utilization 60.3%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 91: Elmwood Ave & East Dr





Lane Group	NEL	NET	SWT	SWR
Lane Configurations				
Volume (vph)	175	1638	380	116
Turn Type	pm+pt			Perm
Protected Phases	5	6	6	
Permitted Phases	6			6
Detector Phase	5	6	6	6
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0
Total Split (s)	22.0	93.0	93.0	93.0
Total Split (%)	19.1%	80.9%	80.9%	80.9%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	C-Max
Act Effect Green (s)	107.0	101.1	101.1	101.1
Actuated g/C Ratio	0.93	0.88	0.88	0.88
v/c Ratio	0.20	1.09	0.25	0.09
Control Delay	0.7	60.7	0.7	0.2
Queue Delay	0.0	14.0	0.2	0.0
Total Delay	0.7	74.8	0.9	0.2
LOS	A	E	A	A
Approach Delay		67.6	0.7	
Approach LOS		E	A	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2: and 6:NESW, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.09
 Intersection Signal Delay: 53.2
 Intersection Capacity Utilization 89.5%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 109: Kendrick &

Timings
117: Alpha Street & Kendrick

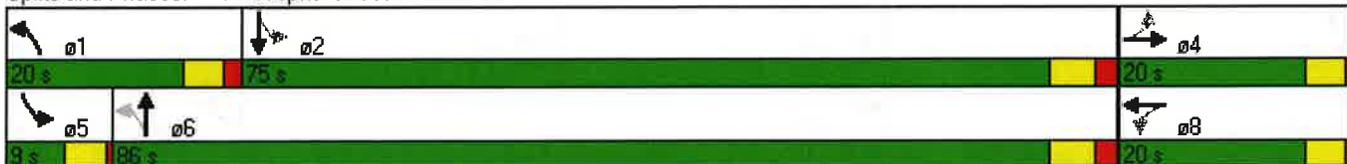
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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations									
Volume (vph)	48	1	31	1	65	455	130	1280	
Turn Type	Perm		Perm		pm+pt		pm+pt		
Protected Phases		4		8	1	6	5	2	
Permitted Phases	4		8		6		2		
Detector Phase	4	4	8	8	1	6	5	2	
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	11.0	10.0	4.0	10.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	32.0	8.0	32.0	
Total Split (s)	20.0	20.0	20.0	20.0	20.0	86.0	9.0	75.0	
Total Split (%)	17.4%	17.4%	17.4%	17.4%	17.4%	74.8%	7.8%	65.2%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	4.0	3.5	4.0	
All-Red Time (s)	0.5	0.5	0.5	0.5	1.5	2.0	0.5	2.0	
Lost Time Adjust (s)	-3.0	0.0	0.0	0.0	-2.0	-3.0	0.0	-3.0	
Total Lost Time (s)	1.0	4.0	4.0	4.0	3.0	3.0	4.0	3.0	
Lead/Lag					Lead	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes		
Recall Mode	None	None	None	None	Min	C-Max	None	C-Max	
Act Effct Green (s)	13.3	10.3	10.3	10.3	99.6	89.1	89.2	83.6	
Actuated g/C Ratio	0.12	0.09	0.09	0.09	0.87	0.77	0.78	0.73	
v/c Ratio	0.38	0.29	0.28	0.34	0.24	0.29	0.23	0.72	
Control Delay	53.5	16.7	53.3	16.0	14.5	0.8	2.4	11.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	
Total Delay	53.5	16.7	53.3	16.0	14.5	0.9	2.7	11.2	
LOS	D	B	D	B	B	A	A	B	
Approach Delay		34.8		28.3		2.2		10.5	
Approach LOS		C		C		A		B	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 9.8
 Intersection Capacity Utilization 71.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 117: Alpha Street & Kendrick



Timings
162: ELMWOOD AVENUE & South

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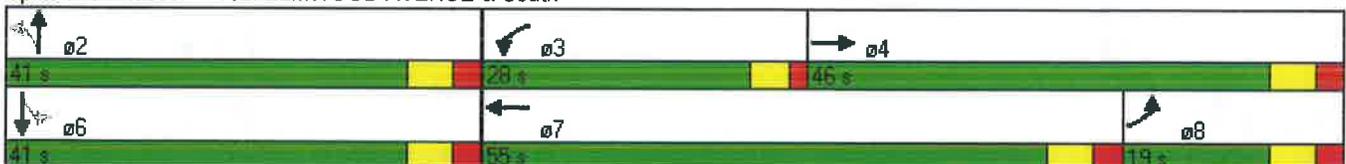


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	227	621	228	1468	5	605	48	462
Turn Type	custom		Prot		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	8				2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	19.0	46.0	28.0	55.0	41.0	41.0	41.0	41.0
Total Split (%)	16.5%	40.0%	24.3%	47.8%	35.7%	35.7%	35.7%	35.7%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?								
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	16.0	45.4	22.6	52.0		38.0		38.0
Actuated g/C Ratio	0.14	0.39	0.20	0.45		0.33		0.33
v/c Ratio	1.02	0.52	0.73	1.06		0.77		1.03
Control Delay	69.5	11.0	55.8	70.9		30.3		75.0
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	69.5	11.0	55.8	70.9		30.3		75.0
LOS	E	B	E	E		C		E
Approach Delay		26.1		68.9		30.3		75.0
Approach LOS		C		E		C		E

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 10 (9%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.06
 Intersection Signal Delay: 53.8
 Intersection Capacity Utilization 111.3%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service H

Splits and Phases: 162: ELMWOOD AVENUE & South



Timings

222: E Henrietta & I-390 NB On Ramp

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Lane Group	EBR	WBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	684	1065	253	1371	1358	92
Turn Type	custom	custom	Prot			Perm
Protected Phases	1	3	1	2	2	
Permitted Phases		1				2
Detector Phase	1	3	1	2	2	2
Switch Phase						
Minimum Initial (s)	48.0	4.0	48.0	48.0	48.0	48.0
Minimum Split (s)	50.0	8.0	50.0	50.0	50.0	50.0
Total Split (s)	51.0	11.0	51.0	53.0	53.0	53.0
Total Split (%)	44.3%	9.6%	44.3%	46.1%	46.1%	46.1%
Yellow Time (s)	2.0	3.5	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.5	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	2.0	4.0	2.0	2.0	2.0	2.0
Lead/Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?						
Recall Mode	Max	None	Max	C-Max	C-Max	C-Max
Act Effct Green (s)	49.0	58.0	49.0	51.0	51.0	51.0
Actuated g/C Ratio	0.43	0.50	0.43	0.44	0.44	0.44
v/c Ratio	0.99	0.84	0.19	0.97	0.96	0.15
Control Delay	57.9	31.4	24.3	30.0	55.7	23.7
Queue Delay	0.0	0.0	0.0	0.0	1.9	0.0
Total Delay	57.9	31.4	24.3	30.0	57.6	23.7
LOS	E	C	C	C	E	C
Approach Delay				29.1	55.5	
Approach LOS				C	E	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 99 (86%), Referenced to phase 2:NBSB and 5:, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.99
 Intersection Signal Delay: 41.6
 Intersection Capacity Utilization 127.3%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service H

Splits and Phases: 222: E Henrietta & I-390 NB On Ramp

ø1	ø2	ø3
51 s	53 s	11 s

Timings

393: ELMWOOD AVENUE & U of R

7/11/2013

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Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑	↑
Volume (vph)	996	64	1358	43	31
Turn Type		pm+pt			Perm
Protected Phases	1	3	1 3	2	
Permitted Phases		1 3			2
Detector Phase	1	3	1 3	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	73.0	11.0	84.0	31.0	31.0
Total Split (%)	63.5%	9.6%	73.0%	27.0%	27.0%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effct Green (s)	70.0	78.0	81.0	28.0	28.0
Actuated g/C Ratio	0.61	0.68	0.70	0.24	0.24
v/c Ratio	0.54	0.22	0.61	0.11	0.08
Control Delay	10.0	3.7	3.3	34.8	11.5
Queue Delay	0.0	0.0	0.4	0.0	0.0
Total Delay	10.0	3.7	3.6	34.8	11.5
LOS	A	A	A	C	B
Approach Delay	10.0		3.6	25.2	
Approach LOS	A		A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 6.9
 Intersection Capacity Utilization 49.2%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 393: ELMWOOD AVENUE & U of R



Timings

7/11/2013

395: Crittenden Blvd & East Dr

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Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	84	305	501	84	246
Turn Type	Perm				Perm
Protected Phases		1	1	2	
Permitted Phases	1				2
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	15.0	15.0
Total Split (s)	69.0	69.0	69.0	46.0	46.0
Total Split (%)	60.0%	60.0%	60.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effect Green (s)	93.9	93.9	93.9	15.1	15.1
Actuated g/C Ratio	0.82	0.82	0.82	0.13	0.13
v/c Ratio	0.17	0.12	0.26	0.40	0.61
Control Delay	3.7	2.7	0.3	50.0	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	2.7	0.3	50.0	11.5
LOS	A	A	A	D	B
Approach Delay		2.9	0.3	21.3	
Approach LOS		A	A	C	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 6.1
 Intersection Capacity Utilization 40.4%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr



Timings
470: MCH & E Henrietta

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	30	1	63	2	196	1934	43	1320
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	14.0	39.0	14.0	39.0
Total Split (s)	26.0	26.0	26.0	26.0	14.0	75.0	14.0	75.0
Total Split (%)	22.6%	22.6%	22.6%	22.6%	12.2%	65.2%	12.2%	65.2%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	13.6	13.6	13.6	13.6	92.4	78.3	92.4	78.3
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.80	0.68	0.80	0.68
v/c Ratio	0.51	0.09	0.43	0.64	0.63	0.95	0.17	0.66
Control Delay	72.8	19.0	53.7	26.1	25.9	13.4	15.8	2.4
Queue Delay	1.3	0.0	0.0	0.8	0.0	41.0	0.0	0.5
Total Delay	74.1	19.0	53.7	27.0	25.9	54.4	15.8	3.0
LOS	E	B	D	C	C	D	B	A
Approach Delay		54.7		34.0		51.9		3.3
Approach LOS		D		C		D		A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 2 (2%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 33.1
 Intersection Capacity Utilization 89.5%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 470: MCH & E Henrietta



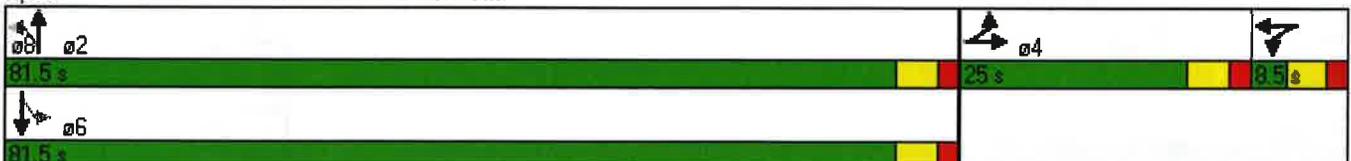


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	384	10	1	55	926	31	1573
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	25.0	25.0	8.5	81.5	81.5	81.5	81.5
Total Split (%)	21.7%	21.7%	7.4%	70.9%	70.9%	70.9%	70.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	21.8	21.8	5.7	83.8	83.8	83.8	83.8
Actuated g/C Ratio	0.19	0.19	0.05	0.73	0.73	0.73	0.73
v/c Ratio	0.89	0.82	0.07	0.91	0.40	0.11	1.21
Control Delay	75.8	60.4	0.5	110.0	7.0	5.2	109.8
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	1.9
Total Delay	75.8	60.6	0.5	110.0	7.0	5.2	111.7
LOS	E	E	A	F	A	A	F
Approach Delay		68.4	0.5		12.7		110.5
Approach LOS		E	A		B		F

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 89 (77%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.21
 Intersection Signal Delay: 82.5
 Intersection Capacity Utilization 108.1%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service G

Splits and Phases: 500: Crittenden & E Henrietta



Timings
501: Southland Drive & West Henrietta Road

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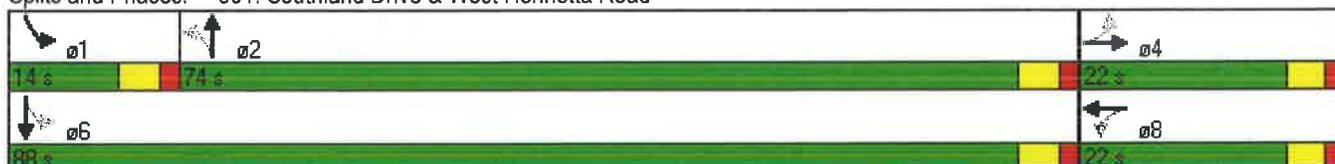
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕	↗	↕	↗	↕
Volume (vph)	41	1	8	1	1	1366	85	1685
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	74.0	74.0	14.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	67.3%	67.3%	12.7%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)		11.2		11.2	86.1	86.1	94.9	95.5
Actuated g/C Ratio		0.10		0.10	0.78	0.78	0.86	0.87
v/c Ratio		0.34		0.16	0.01	0.56	0.30	0.62
Control Delay		47.1		26.1	5.0	5.4	4.0	4.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.3
Total Delay		47.1		26.1	5.0	5.4	4.0	4.3
LOS		D		C	A	A	A	A
Approach Delay		47.1		26.1		5.4		4.3
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 65 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.62
 Intersection Signal Delay: 5.6
 Intersection Capacity Utilization 66.6%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 501: Southland Drive & West Henrietta Road



Timings

7/11/2013

502: Doncaster Road & West Henrietta Road

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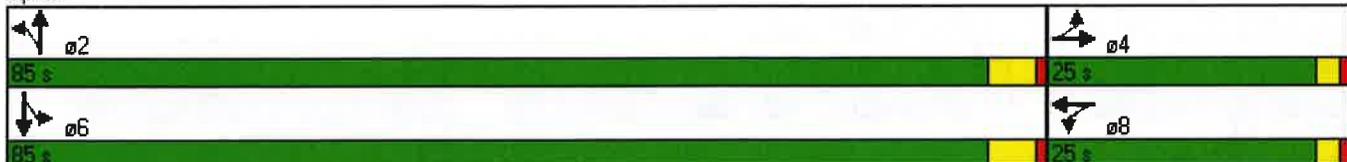


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Volume (vph)	12	1	4	2	1	1374	12	1681
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		6.6		6.5		104.5		104.5
Actuated g/C Ratio		0.06		0.06		0.95		0.95
v/c Ratio		0.13		0.17		0.48		0.60
Control Delay		48.8		33.2		0.6		2.6
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		48.8		33.2		0.6		2.6
LOS		D		C		A		A
Approach Delay		48.8		33.2		0.6		2.6
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 75 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 2.1
 Intersection Capacity Utilization 65.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 502: Doncaster Road & West Henrietta Road



Timings
503: Crittenden & West Henrietta Road

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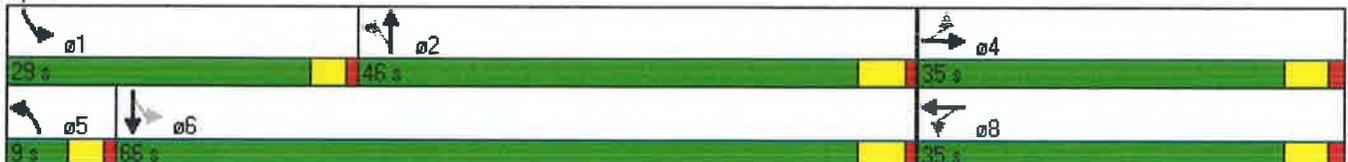


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕↕		↕↕	↖	↕↕	↖	↕↕
Volume (vph)	121	201	268	47	27	961	388	1270
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	9.0	25.0	8.0	25.0
Total Split (s)	35.0	35.0	35.0	35.0	9.0	46.0	29.0	66.0
Total Split (%)	31.8%	31.8%	31.8%	31.8%	8.2%	41.8%	26.4%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		31.1		31.1	51.2	45.1	72.9	67.5
Actuated g/C Ratio		0.28		0.28	0.47	0.41	0.66	0.61
v/c Ratio		1.06dl		0.95	0.14	0.88	0.92	0.66
Control Delay		48.7		51.3	6.8	24.9	48.5	22.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		48.7		51.3	6.8	24.9	48.5	22.4
LOS		D		D	A	C	D	C
Approach Delay		48.7		51.3		24.5		28.5
Approach LOS		D		D		C		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 58 (53%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 32.9
 Intersection Capacity Utilization 96.2%
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 503: Crittenden & West Henrietta Road





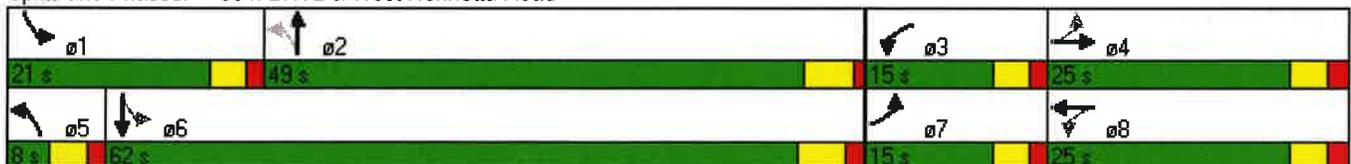
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	175	394	143	354	42	870	242	1108
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	15.0	25.0	15.0	25.0	8.0	49.0	21.0	62.0
Total Split (%)	13.6%	22.7%	13.6%	22.7%	7.3%	44.5%	19.1%	56.4%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	33.2	21.2	32.4	20.8	54.7	49.0	68.2	61.5
Actuated g/C Ratio	0.30	0.19	0.29	0.19	0.50	0.45	0.62	0.56
v/c Ratio	0.74	0.68	0.59	0.77	0.29	0.78	0.81	0.77
Control Delay	46.3	46.3	36.6	47.6	15.2	30.4	47.2	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	46.3	36.6	47.6	15.2	30.4	47.2	16.3
LOS	D	D	D	D	B	C	D	B
Approach Delay		46.3		45.0		29.8		21.0
Approach LOS		D		D		C		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 31.0
 Intersection Capacity Utilization 80.8%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 504: BHTL & West Henrietta Road



HCM Unsignalized Intersection Capacity Analysis
505: Crittenden & East River Road

7/11/2013
University of Rochester, October 2011 Revision



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T			T
Volume (veh/h)	68	10	485	133	2	191
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	76	11	539	148	2	212
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	829	613			687	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	829	613			687	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	78	98			100	
cM capacity (veh/h)	339	492			907	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	87	687	214
Volume Left	76	0	2
Volume Right	11	148	0
cSH	353	1700	907
Volume to Capacity	0.25	0.40	0.00
Queue Length 95th (ft)	24	0	0
Control Delay (s)	18.5	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	18.5	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		44.7%	ICU Level of Service A
Analysis Period (min)		15	

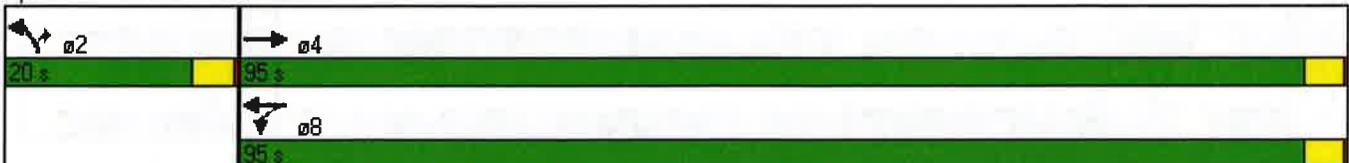
Timings
506: East River Road &

	→	↙	←	↘	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑↑↑	↘	↗
Volume (vph)	1432	270	1364	137	52
Turn Type		Perm			Perm
Protected Phases	4		8	2	
Permitted Phases		8			2
Detector Phase	4	8	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	95.0	95.0	95.0	20.0	20.0
Total Split (%)	82.6%	82.6%	82.6%	17.4%	17.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)	89.8		89.8	17.2	17.2
Actuated g/C Ratio	0.78		0.78	0.15	0.15
v/c Ratio	0.69		2.44dl	0.57	0.20
Control Delay	3.4		16.7	55.7	13.2
Queue Delay	1.9		0.0	0.0	0.0
Total Delay	5.3		16.7	55.7	13.2
LOS	A		B	E	B
Approach Delay	5.3		16.7	44.0	
Approach LOS	A		B	D	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 12.7
 Intersection Capacity Utilization 96.7%
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 506: East River Road &





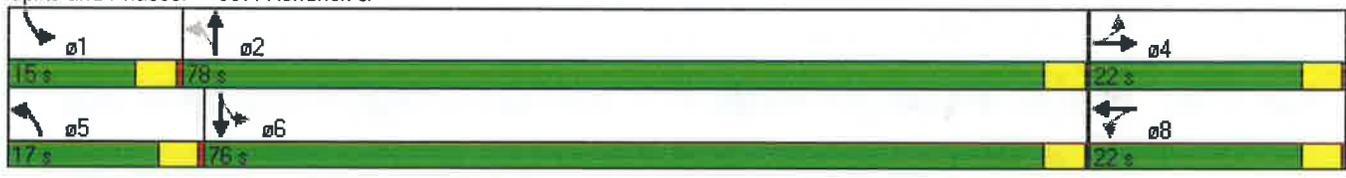
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	20	1	39	1	108	676	131	1143
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	22.0	22.0	22.0	22.0	17.0	78.0	15.0	76.0
Total Split (%)	19.1%	19.1%	19.1%	19.1%	14.8%	67.8%	13.0%	66.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	9.0	9.0	9.0	9.0	95.6	88.8	96.2	89.1
Actuated g/C Ratio	0.08	0.08	0.08	0.08	0.83	0.77	0.84	0.77
v/c Ratio	0.20	0.20	0.40	0.16	0.35	0.33	0.27	0.50
Control Delay	52.5	20.0	60.1	21.3	6.1	6.3	1.8	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2
Total Delay	52.5	20.0	60.1	21.3	6.1	6.6	1.8	2.4
LOS	D	C	E	C	A	A	A	A
Approach Delay		33.8		46.6		6.6		2.3
Approach LOS		C		D		A		A

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.50
 Intersection Signal Delay: 5.7
 Intersection Capacity Utilization 59.1%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 507: Kendrick &



Intersection								
Intersection Delay (sec/veh)	5.8							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		1		2	
Conflicting Circle Lanes	2		2		2		2	
Adjusted Approach Flow (vph)	487		2260		232		439	
Demand Flow Rate (pc/h)	497		2305		237		447	
Vehicles Circulating (pc/h)	591		379		741		565	
Vehicles Exiting (pc/h)	421		599		347		368	
Follow-Up Headway (s)	3.186		3.186		3.186		3.186	
Ped Vol. Crossing Leg (#/hr)	0		0		0		0	
Ped Capacity Adjustment	1.000		1.000		1.000		1.000	
Approach Delay (sec/veh)	9.3		3.7		10.2		10.3	
Approach LOS	A		A		B		B	
Lane	Left	Right	Left	Bypass	Left	Left	Right	
Designated moves	LT	TR	LT	R	LTR	LT	R	
Assumed Moves	L	TR	LT	R	LTR	LT	R	
Right Turn Channelized	Free							
Lane Utilization	0.551	0.449	1.000		1.000	0.767	0.233	
Critical Headway (s)	4.293	4.113	4.293		4.113	4.293	4.113	
Entry Flow Rate (pc/h)	274	223	554	1751	237	343	104	
Capacity, Entry Lane (pc/h)	725	747	850	1938	673	740	761	
Entry HV Adjustment Factor	0.982	0.979	0.980	0.980	0.980	0.982	0.981	
Flow Rate, Entry (vph)	269	218	543	1717	232	337	102	
Capacity, Entry (vph)	712	731	833	1900	659	726	746	
Volume to Capacity Ratio	0.378	0.298	0.651	0.904	0.352	0.464	0.137	
Control Delay (sec/veh)	10.0	8.5	15.3	0.0	10.2	11.5	6.3	
Level of Service	A	A	C	A	B	B	A	
95th-Percentile Queue (veh)	2	1	5	16	2	2	0	

PM Peak Hour

Build Conditions with Mitigation 20-Year

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HCM Unsignalized Intersection Capacity Analysis
 1: East River Road & Kendrick

7/11/2013
 University of Rochester, IPD



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR	
Right Turn Channelized	Yes												
Volume (veh/h)	114	114	90	155	133	520	17	262	304	757	51	219	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	127	127	100	172	148	578	19	291	338	841	57	243	
Approach Volume (veh/h)	353		320			648			1141				
Crossing Volume (veh/h)	1070				437		1094				339		
High Capacity (veh/h)	588				982		576			1061			
High v/c (veh/h)	0.60				0.33		1.12			1.08			
Low Capacity (veh/h)	453				797		443			868			
Low v/c (veh/h)	0.78				0.40		1.46			1.31			
Intersection Summary													
Maximum v/c High			1.12										
Maximum v/c Low			1.46										
Intersection Capacity Utilization			Err%		ICU Level of Service				H				

Timings
2: East River Road & I-390 S On Ramp

7/11/2013
University of Rochester, IPD



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	902	275	604	348	746	218
Turn Type	Split			Perm		Free
Protected Phases	5	5	6		4	
Permitted Phases				6		Free
Detector Phase	5	5	6	6	4	
Switch Phase						
Minimum Initial (s)	3.0	3.0	10.0	10.0	5.0	
Minimum Split (s)	13.0	13.0	20.0	20.0	10.0	
Total Split (s)	46.0	46.0	34.0	34.0	30.0	0.0
Total Split (%)	41.8%	41.8%	30.9%	30.9%	27.3%	0.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	3.0	4.0
Lead/Lag	Lead	Lead	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes				
Recall Mode	None	None	C-Max	C-Max	None	
Act Effct Green (s)	38.5	38.5	31.5	31.5	27.0	110.0
Actuated g/C Ratio	0.35	0.35	0.29	0.29	0.25	1.00
v/c Ratio	0.89	0.85dl	0.66	0.85	0.98	0.15
Control Delay	52.7	34.2	45.6	62.8	69.1	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	34.2	45.6	62.8	69.1	0.2
LOS	D	C	D	E	E	A
Approach Delay		41.3	51.9		53.5	
Approach LOS		D	D		D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 6:WBT, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 48.4
 Intersection Capacity Utilization 74.6%
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: East River Road & I-390 S On Ramp



Timings
3: College Town & Mt. Hope

7/11/2013
University of Rochester, IPD

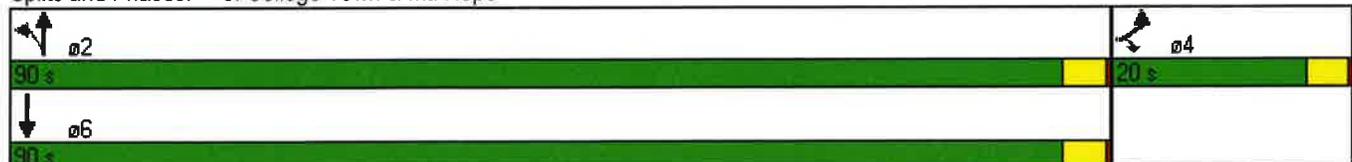


Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	36	97	84	1632	1531
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	90.0	90.0	90.0
Total Split (%)	18.2%	18.2%	81.8%	81.8%	81.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effect Green (s)	9.3	9.3	92.7	92.7	92.7
Actuated g/C Ratio	0.08	0.08	0.84	0.84	0.84
v/c Ratio	0.27	0.57	0.51	0.61	0.58
Control Delay	50.0	35.7	12.8	6.0	0.8
Queue Delay	0.6	0.0	0.0	0.5	1.1
Total Delay	50.6	35.7	12.8	6.5	1.9
LOS	D	D	B	A	A
Approach Delay	39.7			6.8	1.9
Approach LOS	D			A	A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 14 (13%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 5.8
 Intersection Capacity Utilization 61.3%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 3: College Town & Mt. Hope



HCM Unsignalized Intersection Capacity Analysis
 5: I-390 NB On Ramp & West Henrietta Road

7/11/2013
 University of Rochester, IPD



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↑↑↑	↑↑	↗
Volume (veh/h)	0	0	0	2013	1436	771
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	2237	1596	857
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				267	774	
pX, platoon unblocked	0.79	0.66	0.66			
vC, conflicting volume	2341	798	2452			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	219	0	2174			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	593	719	160			

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	746	746	746	798	798	857
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	857
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.44	0.44	0.44	0.47	0.47	0.50
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			51.1%	ICU Level of Service		A
Analysis Period (min)			15			

Timings

7/11/2013

6: East River Road & West Henrietta Road

University of Rochester, IPD

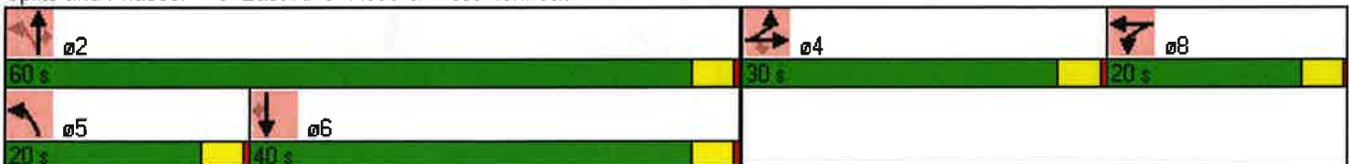


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	SBR
Lane Configurations										
Volume (vph)	309	290	542	173	488	111	1637	361	1092	345
Turn Type	Split		Perm	Split		pm+pt		Perm		Perm
Protected Phases	4	4		8	8	5	2		6	
Permitted Phases			4			2		2		6
Detector Phase	4	4	4	8	8	5	2	2	6	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	30.0	30.0	30.0	20.0	20.0	20.0	60.0	60.0	40.0	40.0
Total Split (%)	27.3%	27.3%	27.3%	18.2%	18.2%	18.2%	54.5%	54.5%	36.4%	36.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.5	-1.0
Total Lost Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	1.5	3.0
Lead/Lag						Lead			Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	26.5	26.5	26.5	17.8	17.8	59.7	59.7	58.7	46.8	45.3
Actuated g/C Ratio	0.24	0.24	0.24	0.16	0.16	0.54	0.54	0.53	0.43	0.41
v/c Ratio	0.80	0.78	0.52	0.67	0.75	0.49	0.66	0.43	0.81	0.45
Control Delay	52.2	34.5	15.6	55.8	48.9	29.8	23.1	12.8	30.6	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	52.2	34.5	15.6	55.8	48.9	29.8	23.3	12.8	30.6	8.8
LOS	D	C	B	E	D	C	C	B	C	A
Approach Delay		34.3			50.5		21.8		25.4	
Approach LOS		C			D		C		C	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Red
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 29.3
 Intersection Capacity Utilization 75.8%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 6: East River Road & West Henrietta Road



Timings
8: I-390 SB Ramp & E Henrietta



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Volume (vph)	252	502	569	1521	909	545	1437
Turn Type	Split		Perm		Free	Prot	
Protected Phases	8	8		1		2	1 2
Permitted Phases			8		Free		
Detector Phase	8	8	8	1		2	1 2
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	3.0		4.0	
Minimum Split (s)	20.0	20.0	20.0	8.0		20.0	
Total Split (s)	33.0	33.0	33.0	57.0	0.0	20.0	77.0
Total Split (%)	30.0%	30.0%	30.0%	51.8%	0.0%	18.2%	70.0%
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag				Lead		Lag	
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max		Max	
Act Effect Green (s)	30.0	30.0	30.0	54.0	110.0	17.0	74.0
Actuated g/C Ratio	0.27	0.27	0.27	0.49	1.00	0.15	0.67
v/c Ratio	0.57	0.97	0.89	0.97	0.64	1.14	0.67
Control Delay	40.6	61.7	57.8	35.1	0.7	126.7	12.5
Queue Delay	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Total Delay	40.6	61.7	57.8	36.1	0.7	126.7	12.5
LOS	D	E	E	D	A	F	B
Approach Delay		57.1		22.9			43.9
Approach LOS		E		C			D

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 78 (71%), Referenced to phase 1:NBSB and 5:, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 38.0
 Intersection Capacity Utilization 85.8%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 8: I-390 SB Ramp & E Henrietta



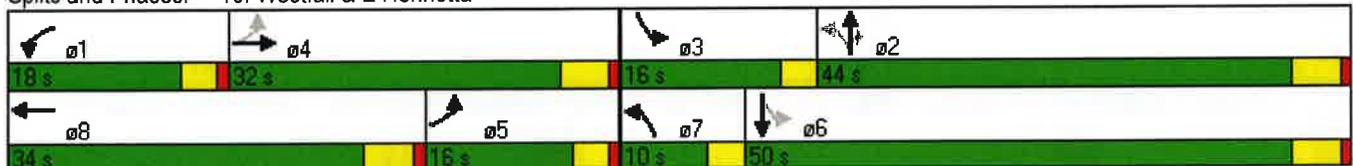
Timings
10: Westfall & E Henrietta

	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↙	↕	↙↘	↕	↙	↕	↗	↙	↕
Volume (vph)	154	483	469	414	166	1215	274	295	1451
Turn Type	pm+pt		Prot		pm+pt		Perm	pm+pt	
Protected Phases	5	4	1	8	7	2		3	6
Permitted Phases	4				2		2	6	
Detector Phase	5	4	1	8	7	2	2	3	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	1.0	10.0	10.0	5.0	10.0
Minimum Split (s)	10.0	32.0	10.0	32.0	10.0	32.0	32.0	10.0	32.0
Total Split (s)	16.0	32.0	18.0	34.0	10.0	44.0	44.0	16.0	50.0
Total Split (%)	14.5%	29.1%	16.4%	30.9%	9.1%	40.0%	40.0%	14.5%	45.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0	-2.0	-1.0	0.0	-2.0
Total Lost Time (s)	4.0	3.0	4.0	3.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	27.3	28.3	14.0	28.4	48.7	41.0	40.0	57.7	47.0
Actuated g/C Ratio	0.25	0.26	0.13	0.26	0.44	0.37	0.36	0.52	0.43
v/c Ratio	0.55	0.82	1.19	0.75	0.94	1.02	0.42	1.12	1.14
Control Delay	51.6	49.5	149.2	38.2	67.5	51.5	6.6	119.5	95.9
Queue Delay	0.6	0.0	0.0	1.3	0.0	38.4	0.0	0.0	56.0
Total Delay	52.2	49.5	149.2	39.5	67.5	89.9	6.6	119.5	151.9
LOS	D	D	F	D	E	F	A	F	F
Approach Delay		50.0		86.2		73.9			146.7
Approach LOS		D		F		E			F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 8 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.19
 Intersection Signal Delay: 97.4
 Intersection Capacity Utilization 98.3%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service F

Splits and Phases: 10: Westfall & E Henrietta



Timings
11: South & E Henrietta

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	↓	↘	↙	↑	ø1	ø3	ø5	ø6	ø7	ø8
Lane Group	SBL	SET	NWT	NWR						
Lane Configurations	↘↘	↑↑	↑	↗						
Volume (vph)	945	766	828	739						
Turn Type				custom						
Protected Phases	2	13	13	12	1	3	5	6	7	8
Permitted Phases		13		1						
Detector Phase	2	13	13	12						
Switch Phase										
Minimum Initial (s)	10.0				24.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	28.0				40.0	21.0	21.0	33.0	33.0	13.0
Total Split (s)	50.0	60.0	60.0	89.0	39.0	21.0	22.0	42.0	33.0	13.0
Total Split (%)	45.5%	54.5%	54.5%	80.9%	35%	19%	20%	38%	30%	12%
Yellow Time (s)	4.0				4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0				1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0						
Total Lost Time (s)	3.0	3.0	3.0	3.0						
Lead/Lag	Lag				Lead		Lead	Lag	Lag	Lead
Lead-Lag Optimize?										
Recall Mode	None				C-Max	None	C-Max	None	None	None
Act Effect Green (s)	44.4	59.6	59.6	83.4						
Actuated g/C Ratio	0.40	0.54	0.54	0.76						
v/c Ratio	0.76	0.48	0.91	0.59						
Control Delay	18.5	4.9	28.7	7.9						
Queue Delay	31.8	0.0	0.4	0.4						
Total Delay	50.4	4.9	29.1	8.3						
LOS	D	A	C	A						
Approach Delay	50.4	4.9	19.3							
Approach LOS	D	A	B							

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 72 (65%), Referenced to phase 1: NWSE and 5:, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 24.9
 Intersection Capacity Utilization 77.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 11: South & E Henrietta

#11 ↘↘ ø1 39 s	#11 ↙ ø2 50 s	#11 ↘ ø3 21 s	
#1612 ↘ ø5 22 s	#1612 ↙ ø6 42 s	#1612 ↘ ø8 13 s	#1612 ↙ ø7 33 s

Timings

12: Crittenden Blvd & Mt. Hope

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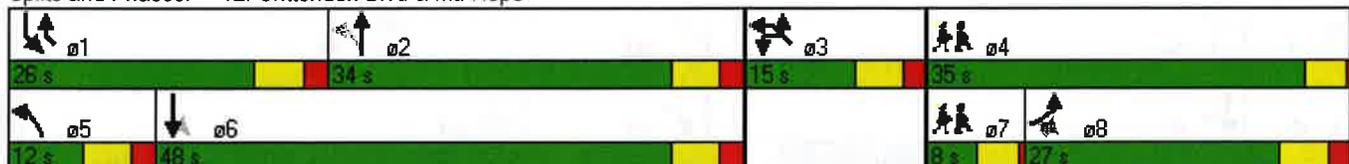


Lane Group	EBL	EBR	EBR2	NBL	NBT	SBL	SBT	NWL	NWR	ø4	ø7
Lane Configurations											
Volume (vph)	245	356	229	149	950	463	1097	179	519		
Turn Type		Perm	Perm	pm+pt		pm+pt			pt+ov		
Protected Phases	8			5	2	1	6	3	3 1	4	7
Permitted Phases		8	8	2		6					
Detector Phase	8	8	8	5	2	1	6	3	3 1		
Switch Phase											
Minimum Initial (s)	13.0	13.0	13.0	5.0	7.0	5.0	7.0	3.0		4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	12.0	27.0	12.0	27.0	12.0		8.0	8.0
Total Split (s)	27.0	27.0	27.0	12.0	34.0	26.0	48.0	15.0	41.0	35.0	8.0
Total Split (%)	24.5%	24.5%	24.5%	10.9%	30.9%	23.6%	43.6%	13.6%	37.3%	32%	7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		0.5	0.5
Lost Time Adjust (s)	-3.0	-3.0	-1.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0		
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lead	Lag				Lead
Lead-Lag Optimize?											Yes
Recall Mode	None	None	None	None	C-Max	None	C-Max	None		None	None
Act Effct Green (s)	32.0	32.0	30.0	40.0	31.0	57.0	45.0	12.0	35.0		
Actuated g/C Ratio	0.29	0.29	0.27	0.36	0.28	0.52	0.41	0.11	0.32		
v/c Ratio	0.53	0.86	0.59	0.78	1.09	1.17	0.90	1.09	0.93		
Control Delay	27.9	47.5	31.4	46.3	83.1	123.6	29.7	119.3	33.5		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0		
Total Delay	27.9	47.5	31.4	46.3	83.1	123.6	30.6	119.3	33.5		
LOS	C	D	C	D	F	F	C	F	C		
Approach Delay	37.3				78.2		57.0	56.4			
Approach LOS	D				E		E	E			

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 63 (57%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.17
 Intersection Signal Delay: 58.7
 Intersection Capacity Utilization 90.2%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service E

Splits and Phases: 12: Crittenden Blvd & Mt. Hope



Timings
13: Elmwood Ave & Mt. Hope

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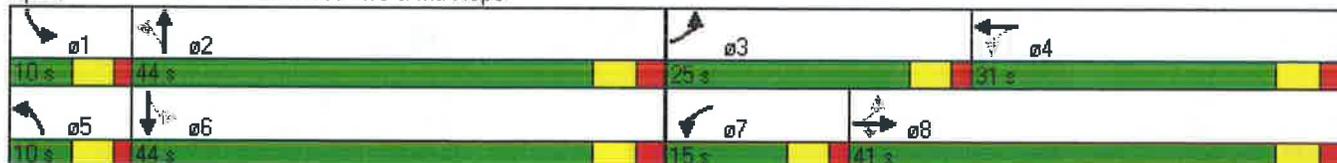


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	598	1183	237	273	736	190	1011	93	1052
Turn Type	pm+pt		Perm	pm+pt		pm+pt		pm+pt	
Protected Phases	3	8		7	4	5	2	1	6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	7	4	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	4.0	7.0	4.0	7.0
Minimum Split (s)	12.0	31.0	31.0	12.0	31.0	10.0	33.0	10.0	33.0
Total Split (s)	25.0	41.0	41.0	15.0	31.0	10.0	44.0	10.0	44.0
Total Split (%)	22.7%	37.3%	37.3%	13.6%	28.2%	9.1%	40.0%	9.1%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	2.5	2.5	1.5	2.5	1.5	2.5	1.5	2.5
Lost Time Adjust (s)	-2.0	-3.0	-1.0	-2.0	-3.0	-2.0	-3.0	-2.0	-3.0
Total Lost Time (s)	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	53.0	38.0	36.0	40.0	28.0	48.0	41.0	48.0	41.0
Actuated g/C Ratio	0.48	0.35	0.33	0.36	0.25	0.44	0.37	0.44	0.37
v/c Ratio	1.57	1.07	0.44	1.15	0.95	1.16	1.26	0.57	1.17
Control Delay	284.4	72.6	10.5	136.8	34.0	136.0	146.5	29.7	115.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Total Delay	284.4	72.6	10.5	136.8	34.0	136.0	149.6	29.7	115.5
LOS	F	E	B	F	C	F	F	C	F
Approach Delay		128.1			61.0		148.0		110.0
Approach LOS		F			E		F		F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.57
 Intersection Signal Delay: 117.9
 Intersection Capacity Utilization 117.3%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H

Splits and Phases: 13: Elmwood Ave & Mt. Hope



Timings
14: Lattimore & Mt. Hope

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Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	121	42	1008	1425
Turn Type	Perm			
Protected Phases	2		1	1
Permitted Phases		1		
Detector Phase	2	1	1	1
Switch Phase				
Minimum Initial (s)	6.0	7.0	7.0	7.0
Minimum Split (s)	26.0	24.0	24.0	24.0
Total Split (s)	35.0	75.0	75.0	75.0
Total Split (%)	31.8%	68.2%	68.2%	68.2%
Yellow Time (s)	3.5	4.0	4.0	4.0
All-Red Time (s)	1.5	1.0	1.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?				
Recall Mode	Min	C-Max	C-Max	C-Max
Act Effct Green (s)	24.4		79.6	79.6
Actuated g/C Ratio	0.22		0.72	0.72
v/c Ratio	0.74		0.58	0.63
Control Delay	44.9		10.9	22.7
Queue Delay	0.0		0.0	0.0
Total Delay	44.9		10.9	22.7
LOS	D		B	C
Approach Delay	44.9		10.9	22.7
Approach LOS	D		B	C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 20.4
 Intersection Capacity Utilization 81.3%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 14: Lattimore & Mt. Hope



Timings
15: Westfall & Mt. Hope

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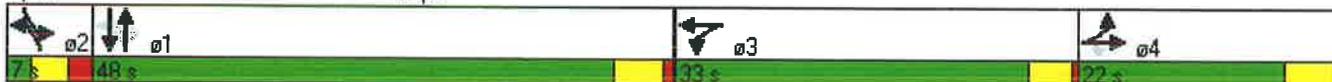


Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↘	↕	↙	↕	↗	↘	↕
Volume (vph)	249	314	522	174	88	911	236	140	1409
Turn Type		Perm	Split		pm+pt		Perm	pm+pt	
Protected Phases	4		3	3	2	1		2	1
Permitted Phases		4			1		1	1	
Detector Phase	4	4	3	3	2	1	1	2	1
Switch Phase									
Minimum Initial (s)	6.0	6.0	4.0	4.0	5.0	21.0	21.0	5.0	21.0
Minimum Split (s)	29.0	29.0	31.0	31.0	13.0	40.0	40.0	13.0	40.0
Total Split (s)	22.0	22.0	33.0	33.0	7.0	48.0	48.0	7.0	48.0
Total Split (%)	20.0%	20.0%	30.0%	30.0%	6.4%	43.6%	43.6%	6.4%	43.6%
Yellow Time (s)	4.0	4.0	3.5	3.5	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	1.0	0.5	0.5	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	2.0	2.0	3.0	3.0	4.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	19.0	19.0	31.0	31.0	49.0	45.0	44.0	49.0	45.0
Actuated g/C Ratio	0.17	0.17	0.28	0.28	0.45	0.41	0.40	0.45	0.41
v/c Ratio	0.90	1.08	0.98	0.93	0.74	0.70	0.37	0.96	1.09
Control Delay	76.3	109.7	79.0	67.5	46.2	32.5	16.7	89.3	86.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	109.7	79.0	67.5	46.2	32.5	16.7	89.3	86.8
LOS	E	F	E	E	D	C	B	F	F
Approach Delay	94.6			73.3		30.4			87.0
Approach LOS	F			E		C			F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.09
 Intersection Signal Delay: 68.7
 Intersection Capacity Utilization 94.1%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service F

Splits and Phases: 15: Westfall & Mt. Hope



Timings
18: Iola & E Henrietta

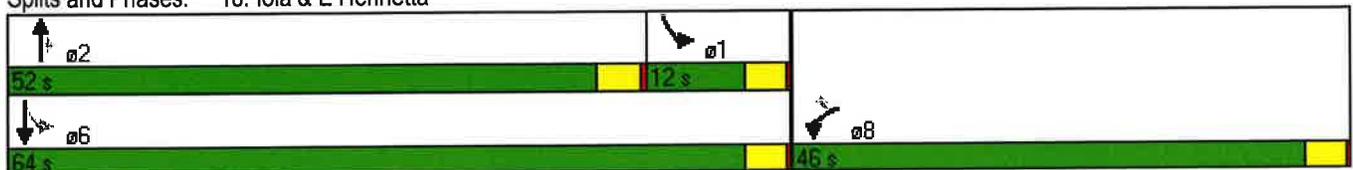
	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↖	↑↑	↗	↘	↑↑
Volume (vph)	194	221	1458	181	160	1975
Turn Type		Perm		Perm	pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	46.0	46.0	52.0	52.0	12.0	64.0
Total Split (%)	41.8%	41.8%	47.3%	47.3%	10.9%	58.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead	Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	19.0	19.0	71.0	71.0	83.0	83.0
Actuated g/C Ratio	0.17	0.17	0.65	0.65	0.75	0.75
v/c Ratio	0.71	0.60	0.71	0.19	0.73	0.82
Control Delay	54.9	20.8	15.9	3.2	27.8	12.3
Queue Delay	0.0	0.0	8.2	0.0	0.0	0.2
Total Delay	54.9	20.8	24.1	3.2	27.8	12.5
LOS	D	C	C	A	C	B
Approach Delay	36.8		21.8			13.6
Approach LOS	D		C			B

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 108 (98%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 19.1
 Intersection Capacity Utilization 72.0%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 18: Iola & E Henrietta



Timings

21: Crittenden Blvd & Kendrick

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Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	101	336	1336	212	713
Turn Type		Perm		pm+pt	
Protected Phases	3		2	1	2
Permitted Phases		3		2	
Detector Phase	3	3	2	1	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0
Total Split (s)	26.0	26.0	64.0	20.0	64.0
Total Split (%)	23.6%	23.6%	58.2%	18.2%	58.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead	Lag	Lead
Lead-Lag Optimize?			Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	C-Max
Act Effct Green (s)	15.1	15.1	68.9	82.9	68.9
Actuated g/C Ratio	0.14	0.14	0.63	0.75	0.63
v/c Ratio	0.46	0.86	0.79	0.79	0.36
Control Delay	51.4	38.7	10.8	51.3	12.2
Queue Delay	0.0	0.0	0.4	0.0	0.0
Total Delay	51.4	38.7	11.3	51.3	12.2
LOS	D	D	B	D	B
Approach Delay	41.6		11.3		21.2
Approach LOS	D		B		C

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 19.0
 Intersection Capacity Utilization 71.0%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 21: Crittenden Blvd & Kendrick



Timings
22: ELMWOOD AVENUE & Kendrick

7/11/2013
University of Rochester, IPD



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑↑	↑↑	↑
Volume (vph)	735	649	276	1005	893	779
Turn Type		pm+ov	pm+pt			custom
Protected Phases	1	2	3	1 3	2	2 3
Permitted Phases		1	1 3			2 3
Detector Phase	1	2	3	1 3	2	2 3
Switch Phase						
Minimum Initial (s)	15.0	10.0	4.0		10.0	
Minimum Split (s)	27.0	26.0	10.0		26.0	
Total Split (s)	28.0	38.0	44.0	72.0	38.0	82.0
Total Split (%)	25.5%	34.5%	40.0%	65.5%	34.5%	74.5%
Yellow Time (s)	4.0	4.0	3.5		4.0	
All-Red Time (s)	1.0	1.5	1.5		1.5	
Lost Time Adjust (s)	-2.0	-1.0	-2.0	-2.0	-2.5	-2.5
Total Lost Time (s)	3.0	4.5	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag			Lag	
Lead-Lag Optimize?						
Recall Mode	C-Max	None	None		None	
Act Effct Green (s)	32.7	69.2	66.0	69.0	35.0	71.3
Actuated g/C Ratio	0.30	0.63	0.60	0.63	0.32	0.65
v/c Ratio	0.78	0.64	0.26	0.50	0.91	0.84
Control Delay	43.3	9.5	2.1	3.9	46.2	9.6
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.2
Total Delay	43.3	9.8	2.1	3.9	46.2	9.8
LOS	D	A	A	A	D	A
Approach Delay	27.6			3.5	29.2	
Approach LOS	C			A	C	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 78 (71%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 21.1
 Intersection Capacity Utilization 75.2%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 22: ELMWOOD AVENUE & Kendrick



Timings
25: Lattimore & Kendrick

7/11/2013
University of Rochester, IPD

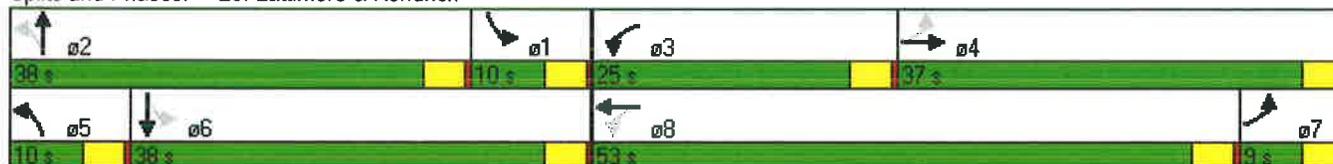


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↕	↖	↕
Volume (vph)	28	1	244	1	124	919	96	1029
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	9.0	37.0	25.0	53.0	10.0	38.0	10.0	38.0
Total Split (%)	8.2%	33.6%	22.7%	48.2%	9.1%	34.5%	9.1%	34.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	12.5	7.3	18.8	17.5	61.9	61.9	57.2	57.2
Actuated g/C Ratio	0.11	0.07	0.17	0.16	0.56	0.56	0.52	0.52
v/c Ratio	0.15	0.59	0.87	0.70	0.49	0.59	0.37	0.61
Control Delay	43.4	19.0	72.5	22.5	23.4	18.3	14.8	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	43.4	19.0	72.5	22.5	23.4	18.3	14.8	11.7
LOS	D	B	E	C	C	B	B	B
Approach Delay		23.4		45.6		18.9		11.9
Approach LOS		C		D		B		B

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 16 (15%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 21.2
 Intersection Capacity Utilization 69.9%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 25: Lattimore & Kendrick



Timings
27: Westmoreland & Kendrick

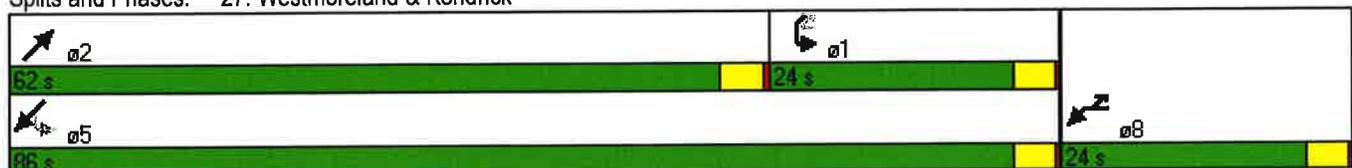


Lane Group	WBL	WBR	NET	SWL	SWT
Lane Configurations	↘	↗	↕	↘	↕
Volume (vph)	23	99	625	186	1448
Turn Type	custom		pm+pt		
Protected Phases	8	8	2	1	5
Permitted Phases	8	1 8		5	
Detector Phase	8	8	2	1	5
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0
Total Split (s)	24.0	24.0	62.0	24.0	86.0
Total Split (%)	21.8%	21.8%	56.4%	21.8%	78.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lead	Lag	
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	None	Min
Act Effct Green (s)	7.1	16.6	85.4	94.9	94.9
Actuated g/C Ratio	0.06	0.15	0.78	0.86	0.86
v/c Ratio	0.22	0.33	0.26	0.31	0.52
Control Delay	51.8	17.0	3.5	2.8	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	17.0	3.5	2.8	2.6
LOS	D	B	A	A	A
Approach Delay	23.5		3.5		2.6
Approach LOS	C		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NET, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 3.9
 Intersection Capacity Utilization 50.0%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 27: Westmoreland & Kendrick



Intersection Sign configuration not allowed in HCM analysis.

Timings
91: Elmwood Ave & East Dr

7/11/2013
University of Rochester, IPD

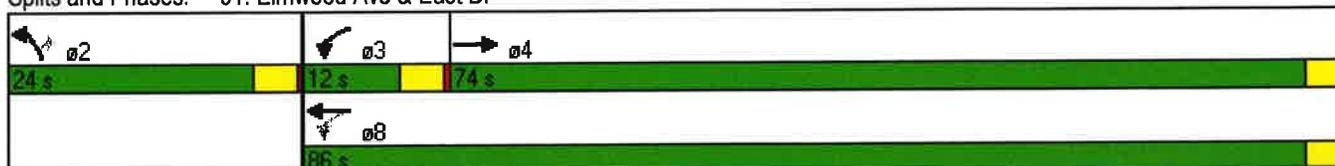


Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↖	↑↑	↖	↗
Volume (vph)	1638	123	1129	128	306
Turn Type		pm+pt			Perm
Protected Phases	4	3	8	2	
Permitted Phases		8			2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0	20.0
Total Split (s)	74.0	12.0	86.0	24.0	24.0
Total Split (%)	67.3%	10.9%	78.2%	21.8%	21.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	C-Max	Min	Min
Act Effct Green (s)	72.1	83.7	83.7	18.3	18.3
Actuated g/C Ratio	0.66	0.76	0.76	0.17	0.17
v/c Ratio	0.87	0.72	0.47	0.48	0.91
Control Delay	8.1	24.8	3.5	46.9	56.3
Queue Delay	0.1	0.0	0.0	0.0	0.0
Total Delay	8.2	24.8	3.5	46.9	56.3
LOS	A	C	A	D	E
Approach Delay	8.2		5.6	53.5	
Approach LOS	A		A	D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 102 (93%), Referenced to phase 8:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 12.9
 Intersection Capacity Utilization 75.8%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 91: Elmwood Ave & East Dr





Lane Group	NEL	NET	SWT	SWR
Lane Configurations				
Volume (vph)	269	643	1006	419
Turn Type	Prot			Perm
Protected Phases	5		6	
Permitted Phases		6		6
Detector Phase	5	6	6	6
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0
Total Split (s)	35.0	75.0	75.0	75.0
Total Split (%)	31.8%	68.2%	68.2%	68.2%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	23.3	78.7	78.7	78.7
Actuated g/C Ratio	0.21	0.72	0.72	0.72
v/c Ratio	0.78	0.52	0.82	0.38
Control Delay	54.8	9.8	13.5	2.0
Queue Delay	0.0	0.0	0.0	0.2
Total Delay	54.8	9.8	13.5	2.2
LOS	D	A	B	A
Approach Delay		23.1	10.2	
Approach LOS		C	B	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2: and 6:NESW, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 15.2
 Intersection Capacity Utilization 74.5%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 109: Kendrick &



Timings
117: Alpha Street & Kendrick

7/11/2013
University of Rochester, IPD



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	159	1	170	1	19	1184	57	706
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		1		1		2		2
Permitted Phases	1		1		2		2	
Detector Phase	1	1	1	1	2	2	2	2
Switch Phase								
Minimum Initial (s)	11.0	11.0	11.0	11.0	10.0	10.0	10.0	10.0
Minimum Split (s)	20.0	20.0	20.0	20.0	32.0	32.0	32.0	32.0
Total Split (s)	29.0	29.0	29.0	29.0	81.0	81.0	81.0	81.0
Total Split (%)	26.4%	26.4%	26.4%	26.4%	73.6%	73.6%	73.6%	73.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-3.0	0.0	0.0	0.0	-2.0	-3.0	0.0	-3.0
Total Lost Time (s)	2.0	5.0	5.0	5.0	4.0	3.0	6.0	3.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	Min	Min	Min	Min	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	26.3	23.3	23.3	23.3	77.7	78.7	75.7	78.7
Actuated g/C Ratio	0.24	0.21	0.21	0.21	0.71	0.72	0.69	0.72
v/c Ratio	0.93	0.32	0.79	0.54	0.06	0.60	0.33	0.36
Control Delay	92.2	8.1	65.8	26.8	1.7	5.6	8.6	4.6
Queue Delay	12.8	0.0	0.0	0.2	0.0	0.1	0.0	0.2
Total Delay	105.1	8.1	65.8	27.0	1.7	5.7	8.6	4.8
LOS	F	A	E	C	A	A	A	A
Approach Delay		61.4		44.8		5.6		5.1
Approach LOS		E		D		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 16.6
 Intersection Capacity Utilization 79.9%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 117: Alpha Street & Kendrick



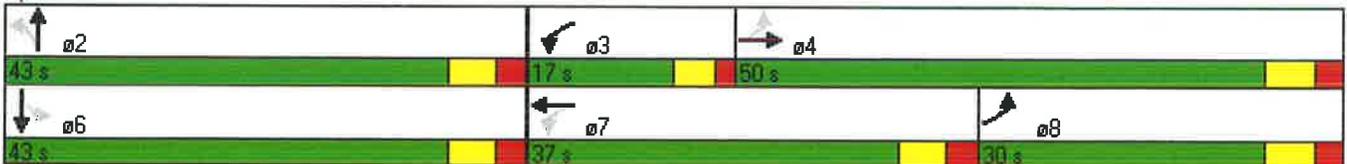
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	251	1431	257	730	7	628	62	509
Turn Type	pm+pt		pm+pt		Perm		Perm	
Protected Phases	8	4	3	7		2		6
Permitted Phases	4		7		2		6	
Detector Phase	8	4	3	7	2	2	6	6
Switch Phase								
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	15.0	34.0	15.0	34.0	33.0	33.0	33.0	33.0
Total Split (s)	30.0	50.0	17.0	37.0	43.0	43.0	43.0	43.0
Total Split (%)	27.3%	45.5%	15.5%	33.6%	39.1%	39.1%	39.1%	39.1%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-3.5	-3.5	-2.0	-3.5	-3.5	-3.5	-3.5	-3.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lead	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	Max	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	47.0	47.0	33.5	33.5		40.0		40.0
Actuated g/C Ratio	0.43	0.43	0.30	0.30		0.36		0.36
v/c Ratio	0.54	1.08	0.96	0.79		0.82		1.00
Control Delay	16.5	55.6	76.3	41.2		43.4		67.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	16.5	55.6	76.3	41.2		43.4		67.6
LOS	B	E	E	D		D		E
Approach Delay		49.9		50.0		43.4		67.6
Approach LOS		D		D		D		E

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 11 (10%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.08
 Intersection Signal Delay: 51.4
 Intersection Capacity Utilization 114.0%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service H

Splits and Phases: 162: ELMWOOD AVENUE & South



Timings
222: E Henrietta & I-390 NB On Ramp

7/11/2013
University of Rochester, IPD



Lane Group	EBR	WBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	300	481	616	1157	1682	519
Turn Type	custom	custom	custom			custom
Protected Phases	1	3	1	2	2	2
Permitted Phases	1	1	1		2	2
Detector Phase	1	3	1	2	2	2
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	27.0	20.0	27.0	68.0	68.0	68.0
Total Split (%)	23.5%	17.4%	23.5%	59.1%	59.1%	59.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag		Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	23.0	34.3	23.0	72.7	72.7	72.7
Actuated g/C Ratio	0.20	0.30	0.20	0.63	0.63	0.63
v/c Ratio	0.66	0.64	1.00	0.58	0.84	0.58
Control Delay	20.7	38.9	79.7	13.8	21.3	15.5
Queue Delay	0.0	0.0	0.0	0.0	55.9	3.2
Total Delay	20.7	38.9	79.7	13.8	77.2	18.7
LOS	C	D	E	B	E	B
Approach Delay				36.6	63.4	
Approach LOS				D	E	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 48.2
 Intersection Capacity Utilization 90.9%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 222: E Henrietta & I-390 NB On Ramp





Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↖	↑↑	↖	↗
Volume (vph)	1466	40	1249	31	46
Turn Type		pm+pt			Perm
Protected Phases	1	3	1 3	2	
Permitted Phases		1 3			2
Detector Phase	1	3	1 3	2	2
Switch Phase					
Minimum Initial (s)	7.0	4.0		6.0	6.0
Minimum Split (s)	35.0	9.0		31.0	31.0
Total Split (s)	70.0	9.0	79.0	31.0	31.0
Total Split (%)	63.6%	8.2%	71.8%	28.2%	28.2%
Yellow Time (s)	3.5	3.5		3.5	3.5
All-Red Time (s)	2.5	1.5		2.0	2.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	None		Max	Max
Act Effct Green (s)	67.0	73.0	76.0	28.0	28.0
Actuated g/C Ratio	0.61	0.66	0.69	0.25	0.25
v/c Ratio	0.78	0.27	0.57	0.08	0.12
Control Delay	17.3	13.3	4.0	31.9	9.5
Queue Delay	0.2	0.0	0.1	0.0	0.0
Total Delay	17.4	13.3	4.1	31.9	9.5
LOS	B	B	A	C	A
Approach Delay	17.4		4.3	18.4	
Approach LOS	B		A	B	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 11.6
 Intersection Capacity Utilization 53.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 393: ELMWOOD AVENUE & U of R



Timings
395: Crittenden Blvd & East Dr

7/11/2013
University of Rochester, IPD



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	78	624	274	201	157
Turn Type	Perm				Perm
Protected Phases		1	1	2	
Permitted Phases	1				2
Detector Phase	1	1	1	2	2
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	6.0	6.0
Minimum Split (s)	30.0	30.0	30.0	15.0	15.0
Total Split (s)	60.0	60.0	60.0	50.0	50.0
Total Split (%)	54.5%	54.5%	54.5%	45.5%	45.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-3.0	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	81.0	81.0	81.0	23.0	23.0
Actuated g/C Ratio	0.74	0.74	0.74	0.21	0.21
v/c Ratio	0.13	0.27	0.17	0.60	0.37
Control Delay	6.2	6.3	3.1	45.6	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	6.3	3.1	45.6	7.2
LOS	A	A	A	D	A
Approach Delay		6.3	3.1	28.7	
Approach LOS		A	A	C	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 10.9
 Intersection Capacity Utilization 38.3%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 395: Crittenden Blvd & East Dr



Timings
470: MCH & E Henrietta

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	61	1	228	1	10	1494	162	1871
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		2		2	3	1	3	1
Permitted Phases	2		2		1		1	
Detector Phase	2	2	2	2	3	1	3	1
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	20.0	4.0	20.0
Minimum Split (s)	32.0	32.0	32.0	32.0	14.0	39.0	14.0	39.0
Total Split (s)	32.0	32.0	32.0	32.0	14.0	64.0	14.0	64.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	12.7%	58.2%	12.7%	58.2%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	26.7	26.7	26.7	26.7	74.3	63.4	74.3	63.4
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.68	0.58	0.68	0.58
v/c Ratio	0.26	0.20	0.85	0.28	0.05	0.92	0.74	1.05
Control Delay	35.5	8.0	64.6	7.1	2.4	18.1	35.3	43.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	14.9	0.0	37.4
Total Delay	35.5	8.0	64.6	7.1	2.4	33.0	35.3	80.5
LOS	D	A	E	A	A	C	D	F
Approach Delay		19.8		44.6		32.8		77.0
Approach LOS		B		D		C		E

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 109 (99%), Referenced to phase 1:NBSB, Start of Green
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.05
 Intersection Signal Delay: 55.0
 Intersection Capacity Utilization 87.9%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service E

Splits and Phases: 470: MCH & E Henrietta



Timings
500: Crittenden & E Henrietta

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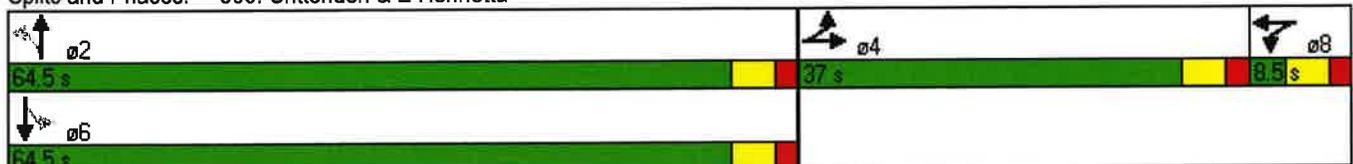
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	1015	1	1	94	1389	11	1497
Turn Type	Split			Perm		Perm	
Protected Phases	4	4	8		2		6
Permitted Phases				2		6	
Detector Phase	4	4	8	2	2	6	6
Switch Phase							
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	8.5	25.5	25.5	25.0	25.0
Total Split (s)	37.0	37.0	8.5	64.5	64.5	64.5	64.5
Total Split (%)	33.6%	33.6%	7.7%	58.6%	58.6%	58.6%	58.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	34.0	34.0	5.5	64.9	64.9	64.9	64.9
Actuated g/C Ratio	0.31	0.31	0.05	0.59	0.59	0.59	0.59
v/c Ratio	1.34	1.23	0.21	1.46	0.74	0.16	1.09
Control Delay	197.9	150.1	33.0	300.0	19.9	13.3	63.2
Queue Delay	0.0	1.0	0.0	0.0	0.3	0.0	0.0
Total Delay	197.9	151.1	33.0	300.0	20.2	13.3	63.2
LOS	F	F	C	F	C	B	E
Approach Delay		175.6	33.0		37.9		63.0
Approach LOS		F	C		D		E

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 12 (11%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.46
 Intersection Signal Delay: 83.5
 Intersection Capacity Utilization 113.0%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service H

Splits and Phases: 500: Crittenden & E Henrietta



Timings
501: Southland Drive & West Henrietta Road

7/11/2013
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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕	↙	↕	↙	↕
Volume (vph)	11	1	30	1	7	1958	29	1576
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	8.0	8.0	8.0	25.0	25.0	8.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	75.0	75.0	13.0	88.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	68.2%	68.2%	11.8%	80.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		12.8		12.8	84.5	84.5	91.2	91.2
Actuated g/C Ratio		0.12		0.12	0.77	0.77	0.83	0.83
v/c Ratio		0.23		0.66	0.05	0.81	0.16	0.61
Control Delay		24.9		28.2	7.6	10.5	7.2	2.0
Queue Delay		0.0		0.0	0.0	0.1	0.0	0.1
Total Delay		24.9		28.2	7.6	10.6	7.2	2.1
LOS		C		C	A	B	A	A
Approach Delay		24.9		28.2		10.6		2.2
Approach LOS		C		C		B		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 62 (56%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 7.9
 Intersection Capacity Utilization 73.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service D

Splits and Phases: 501: Southland Drive & West Henrietta Road



Timings
502: Doncaster Road & West Henrietta Road

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕↕		↕↕
Volume (vph)	4	1	17	1	7	1963	14	1595
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	25.0	25.0	25.0	85.0	85.0	85.0	85.0
Total Split (%)	22.7%	22.7%	22.7%	22.7%	77.3%	77.3%	77.3%	77.3%
Yellow Time (s)	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)		7.2		7.2		101.4		101.4
Actuated g/C Ratio		0.07		0.07		0.92		0.92
v/c Ratio		0.08		0.34		0.71		0.61
Control Delay		38.6		38.6		1.6		1.9
Queue Delay		0.0		0.0		0.2		0.1
Total Delay		38.6		38.6		1.8		2.0
LOS		D		D		A		A
Approach Delay		38.6		38.6		1.8		2.0
Approach LOS		D		D		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 71 (65%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 2.3
 Intersection Capacity Utilization 69.3%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 502: Doncaster Road & West Henrietta Road



Timings
503: Crittenden & West Henrietta Road

7/11/2013
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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔↔		↔↔	↖	↗	↖	↗
Volume (vph)	28	76	307	202	105	1663	236	1587
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	25.0	25.0	25.0	25.0	9.0	25.0	8.0	25.0
Total Split (s)	32.0	32.0	32.0	32.0	9.0	66.0	12.0	69.0
Total Split (%)	29.1%	29.1%	29.1%	29.1%	8.2%	60.0%	10.9%	62.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	0.0	1.0	0.0	1.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	0.0	-2.0	0.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		29.0		29.0	69.0	63.0	75.0	66.0
Actuated g/C Ratio		0.26		0.26	0.63	0.57	0.68	0.60
v/c Ratio		0.28		1.19	0.70	1.08	1.22	0.90
Control Delay		23.3		117.3	26.5	46.9	156.2	31.8
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.3		117.3	26.5	46.9	156.2	31.8
LOS		C		F	C	D	F	C
Approach Delay		23.3		117.3		45.9		46.8
Approach LOS		C		F		D		D

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 54 (49%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.22
 Intersection Signal Delay: 56.9
 Intersection Capacity Utilization 108.5%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service G

Splits and Phases: 503: Crittenden & West Henrietta Road



Timings
504: BHTL & West Henrietta Road

7/11/2013
University of Rochester, IPD

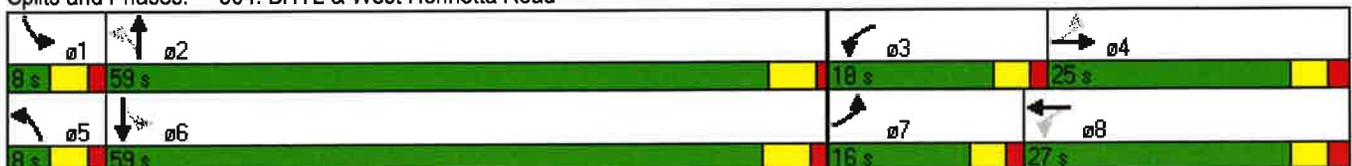


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	203	324	389	375	46	1617	167	1678
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Split (s)	8.0	25.0	8.0	25.0	8.0	25.0	8.0	25.5
Total Split (s)	16.0	25.0	18.0	27.0	8.0	59.0	8.0	59.0
Total Split (%)	14.5%	22.7%	16.4%	24.5%	7.3%	53.6%	7.3%	53.6%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.5	2.0	1.5	2.0	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	-1.5	-2.0	-1.5	-2.0	-1.5	-2.0	-1.5	-2.5
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	34.4	21.4	38.4	23.4	61.4	56.0	62.2	58.2
Actuated g/C Ratio	0.31	0.19	0.35	0.21	0.56	0.51	0.57	0.53
v/c Ratio	0.81	0.64	1.29	0.84	0.33	1.16	1.18	1.13
Control Delay	50.1	43.3	178.0	46.4	15.7	104.0	134.8	87.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	43.3	178.0	46.4	15.7	104.0	134.8	87.0
LOS	D	D	F	D	B	F	F	F
Approach Delay		45.6		98.6		101.8		90.9
Approach LOS		D		F		F		F

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 44 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.29
 Intersection Signal Delay: 91.1
 Intersection Capacity Utilization 107.4%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service G

Splits and Phases: 504: BHTL & West Henrietta Road



HCM Unsignalized Intersection Capacity Analysis
 505: Crittenden & East River Road

7/11/2013
 University of Rochester, IPD



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	122	13	271	41	14	383
Sign Control	Stop		Free			Free
Grade	2%		1%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	136	14	301	46	16	426
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	781	324			347	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	781	324			347	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	62	98			99	
cM capacity (veh/h)	359	717			1212	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	150	347	441
Volume Left	136	0	16
Volume Right	14	46	0
cSH	377	1700	1212
Volume to Capacity	0.40	0.20	0.01
Queue Length 95th (ft)	47	0	1
Control Delay (s)	20.7	0.0	0.4
Lane LOS	C		A
Approach Delay (s)	20.7	0.0	0.4
Approach LOS	C		

Intersection Summary			
Average Delay		3.5	
Intersection Capacity Utilization		45.7%	ICU Level of Service
Analysis Period (min)		15	A



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑↑↑	↖	↗
Volume (vph)	905	102	824	128	145
Turn Type		Perm			Perm
Protected Phases	4		8	2	
Permitted Phases		8			2
Detector Phase	4	8	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	80.0	80.0	80.0	30.0	30.0
Total Split (%)	72.7%	72.7%	72.7%	27.3%	27.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)	49.7		49.7	52.3	52.3
Actuated g/C Ratio	0.45		0.45	0.48	0.48
v/c Ratio	0.69		1.04dl	0.17	0.19
Control Delay	14.0		18.1	19.5	4.1
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	14.0		18.1	19.5	4.1
LOS	B		B	B	A
Approach Delay	14.0		18.1	11.3	
Approach LOS	B		B	B	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 15.4
 Intersection Capacity Utilization 62.9%
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 506: East River Road &

↖ ø2	→ ø4
30 s	80 s
	↖ ø8
	80 s



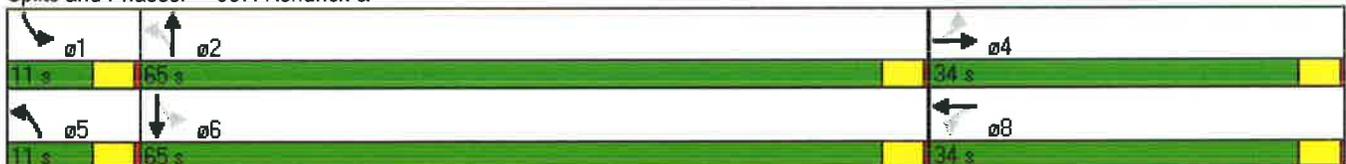
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	72	1	107	1	47	1125	57	911
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	34.0	34.0	34.0	34.0	11.0	65.0	11.0	65.0
Total Split (%)	30.9%	30.9%	30.9%	30.9%	10.0%	59.1%	10.0%	59.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	16.3	16.3	16.3	16.3	82.3	77.1	82.7	77.3
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.75	0.70	0.75	0.70
v/c Ratio	0.47	0.36	0.76	0.32	0.13	0.53	0.20	0.43
Control Delay	50.0	10.0	72.4	10.3	2.9	5.9	4.1	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3
Total Delay	50.0	10.0	72.4	10.3	2.9	6.1	4.1	6.1
LOS	D	B	E	B	A	A	A	A
Approach Delay		26.0		43.9		6.0		6.0
Approach LOS		C		D		A		A

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 10.2
 Intersection Capacity Utilization 58.8%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 507: Kendrick &



Intersection									
Intersection Delay (sec/veh)	24.8								
Intersection LOS	C								
Approach	EB		WB		NB		SB		
Entry Lanes	2		2		1		2		
Conflicting Circle Lanes	2		2		2		2		
Adjusted Approach Flow (vph)	354		898		648		1141		
Demand Flow Rate (pc/h)	362		916		661		1164		
Vehicles Circulating (pc/h)	1091		446		1118		345		
Vehicles Exiting (pc/h)	418		988		335		427		
Follow-Up Headway (s)	3.186		3.186		3.186		3.186		
Ped Vol. Crossing Leg (#/hr)	0		0		0		0		
Ped Capacity Adjustment	1.000		1.000		1.000		1.000		
Approach Delay (sec/veh)	12.8		3.4		9.9		53.8		
Approach LOS	B		A		A		F		
Lane	Left	Right	Left	Bypass	Left	Bypass	Left	Right	
Designated moves	LT	TR	LT	R	LT	R	LT	R	
Assumed Moves	LT	TR	LT	R	LT	R	LT	R	
Right Turn Channelized				Free		Free			
Lane Utilization	0.470	0.530	1.000		1.000		0.787	0.213	
Critical Headway (s)	4.293	4.113	4.293		4.113		4.293	4.113	
Entry Flow Rate (pc/h)	170	192	326	590	316	345	916	248	
Capacity, Entry Lane (pc/h)	499	526	809	1938	517	1938	872	888	
Entry HV Adjustment Factor	0.980	0.978	0.982	0.980	0.982	0.980	0.980	0.980	
Flow Rate, Entry (vph)	167	188	320	578	310	338	898	243	
Capacity, Entry (vph)	489	515	794	1900	507	1900	855	870	
Volume to Capacity Ratio	0.341	0.365	0.403	0.304	0.612	0.178	1.050	0.279	
Control Delay (sec/veh)	12.8	12.8	9.6	0.0	20.7	0.0	66.5	7.1	
Level of Service	B	B	A	A	C	A	F	A	
95th-Percentile Queue (veh)	1	2	2	1	4	1	21	1	

APPENDIX 'E'

Traffic Signal Warrant Analysis & Auxiliary Lane Configurations

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**Table
College Town
Traffic Volume Summary
and Assignment to Elmwood/East Drive Intersection**

TIME OF DAY	Total College Town Vehicle Trips (1)			Credit for Vacating Uses at College Town (2)			Net College Town Vehicle Trips			Assignment to Elmwood/East Int.						East Dr @ Elmwood College Town Volumes			
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Exiting			Entering			Exiting Volume	Entering Volume	WB L	WB R
										NB L	NB R	WB L	WB R	NB L	NB R					WB L	WB R
6:00 - 7:00 AM	26	28	55	19	0	19	7	29	36	15%	10%	10%	15%	4	3	1	1		
7:00 - 8:00 AM	105	95	200	69	12	81	36	83	119	15%	10%	10%	15%	12	8	4	5		
8:00 - 9:00 AM	279	158	437	225	49	274	54	109	163	15%	10%	10%	15%	16	11	4	8		
9:00 - 10:00 AM	231	173	404	188	68	256	43	105	148	15%	10%	10%	15%	16	11	4	6		
10:00 - 11:00 AM	208	212	420	171	86	257	37	126	163	15%	10%	10%	15%	19	13	4	6		
11:00 - 12:00 AM	216	254	470	188	137	325	28	117	145	15%	10%	10%	15%	18	12	3	4		
12:00 - 1:00 PM	285	340	625	216	289	505	69	51	120	15%	10%	10%	15%	8	5	7	10		
1:00 - 2:00 PM	271	257	528	183	154	337	88	103	191	15%	10%	10%	15%	15	10	9	13		
2:00 - 3:00 PM	273	238	511	144	142	286	129	96	225	15%	10%	10%	15%	14	10	13	19		
3:00 - 4:00 PM	263	252	515	86	146	232	177	106	283	15%	10%	10%	15%	16	11	18	27		
4:00 - 5:00 PM	278	310	588	70	229	299	208	81	289	15%	10%	10%	15%	12	8	21	31		
5:00 - 6:00 PM	279	394	673	96	234	330	183	160	343	15%	10%	10%	15%	24	16	18	27		
6:00 - 7:00 PM	227	224	451	53	120	173	174	104	278	15%	10%	10%	15%	16	10	17	26		
7:00 - 8:00 PM	179	170	349	2	36	38	177	134	311	15%	10%	10%	15%	20	13	18	27		
8:00 - 9:00 PM	131	117	248	2	7	9	129	110	239	15%	10%	10%	15%	17	11	13	19		
9:00 - 10:00 PM	56	64	120	0	3	3	56	61	117	15%	10%	10%	15%	9	6	6	8		
10:00 - 11:00 PM	17	35	52	0	0	0	17	35	52	15%	10%	10%	15%	5	4	2	3		
DAILY	3324	3322	6646	1712	1712	3424	1612	1610	3222					241	162	163	240		

(1) College Town daily, morning and evening peak hour vehicle trips determined per calculations shown in Table 2. Distribution of vehicle trips over 24-hour period shown in Table E-3.

(2) College Town credit determined based on current uses, as summarized in Table B-3. Distribution of vehicle trips over 24-hour period shown in Table E-4.

Table
College Town Temporal Distribution and
24-Hour Traffic Volume Summary

Time Period	Retail (1)			Office (2)			Residential (3)		
	Percent Entering	Percent Exiting	Total	Percent Entering	Percent Exiting	Total	Percent Entering	Percent Exiting	Total
6:00 - 7:00 AM	0.5%	0.00%	0.26%	1.1%	0.1%	0.61%	1.01%	3.49%	2.26%
7:00 - 8:00 AM	2.3%	0.30%	1.31%	4.0%	0.6%	2.30%	4.00%	10.62%	7.34%
8:00 - 9:00 AM	2.9%	1.85%	2.39%	24.9%	3.4%	14.12%	3.05%	12.30%	7.65%
9:00 - 10:00 AM	6.4%	5.60%	6.00%	11.0%	3.6%	7.33%	3.80%	5.91%	4.83%
10:00 - 11:00 AM	7.5%	8.50%	8.00%	5.8%	4.1%	4.97%	3.90%	4.05%	3.95%
11:00 - 12:00 PM	7.9%	8.80%	8.35%	5.3%	8.0%	6.67%	4.52%	4.68%	4.58%
12:00 - 1:00 PM	7.8%	8.90%	8.35%	12.6%	16.9%	14.73%	5.90%	6.00%	5.96%
1:00 - 2:00 PM	7.9%	8.60%	8.27%	10.7%	7.9%	9.27%	5.94%	5.50%	5.71%
2:00 - 3:00 PM	8.7%	8.40%	8.53%	8.4%	5.4%	6.91%	6.90%	6.14%	6.52%
3:00 - 4:00 PM	9.2%	8.70%	8.93%	4.2%	6.4%	5.33%	8.80%	6.31%	7.53%
4:00 - 5:00 PM	8.6%	8.60%	8.61%	4.1%	13.4%	8.79%	12.10%	6.40%	9.22%
5:00 - 6:00 PM	8.4%	9.05%	8.73%	4.6%	22.5%	13.58%	12.20%	6.57%	9.35%
6:00 - 7:00 PM	7.6%	8.10%	7.86%	3.1%	5.0%	4.06%	8.80%	5.48%	7.15%
7:00 - 8:00 PM	7.3%	6.70%	6.98%	0.1%	2.1%	1.09%	6.60%	4.80%	5.71%
8:00 - 9:00 PM	5.0%	4.80%	4.89%	0.1%	0.4%	0.24%	5.50%	4.00%	4.77%
9:00 - 10:00 PM	2.0%	2.20%	2.10%	0.0%	0.2%	0.12%	2.70%	3.00%	2.89%
10:00 - 11:00 PM	0.0%	0.90%	0.44%	0.0%	0.0%	0.00%	2.13%	2.50%	2.32%
Daily Totals	100.0%	100.00%	100.00%	100.0%	100.00%	100.12%	97.85%	97.75%	97.74%

(1) Retail temporal distribution derived from the ITE Trip Generation Manual, 7th Edition.
(2) Office temporal distribution derived from Urban Space for Pedestrians, by Pushkarev & Jupan, Regional Plan Association.
(3) Residential temporal distribution derived from a review of two machine counts conducted on residential streets, one in Buffalo, NY, and one in Fredericksburg, VA.

Time of Day	College Town Components						Total		
	Retail		Office		Residential		Enter	Exit	Total
	Enter	Exit	Enter	Exit	Enter	Exit			
6:00 - 7:00 AM	9	0	9	1	10	8	26	29	55
7:00 - 8:00 AM	40	5	45	5	38	32	105	95	200
8:00 - 9:00 AM	50	32	82	28	233	24	279	158	437
9:00 - 10:00 AM	110	96	206	30	121	30	231	173	404
10:00 - 11:00 AM	129	146	275	48	82	31	208	212	420
11:00 - 12:00 PM	136	151	287	44	110	36	216	254	470
12:00 - 1:00 PM	134	153	287	104	243	47	285	340	625
1:00 - 2:00 PM	136	148	284	88	153	47	271	257	528
2:00 - 3:00 PM	149	144	293	69	114	55	273	238	511
3:00 - 4:00 PM	158	149	307	35	88	70	263	252	515
4:00 - 5:00 PM	148	148	296	34	145	96	278	310	588
5:00 - 6:00 PM	144	156	300	38	186	97	279	394	673
6:00 - 7:00 PM	131	139	270	26	41	70	227	224	451
7:00 - 8:00 PM	125	115	240	1	18	53	179	170	349
8:00 - 9:00 PM	86	82	168	1	4	44	131	117	248
9:00 - 10:00 PM	34	38	72	0	2	22	56	64	120
10:00 - 11:00 PM	0	15	15	0	0	17	17	35	52
Daily	1718	1718	3436	825	1650	797	3324	3322	6646

Table E-4
University of Rochester
College Town Credit
24-Hour Traffic Volume Summary

Time of Day	Temporal Distribution (1)		College Town Credit		
	Enter %	Exit %	Enter	Exit	Total
6:00 - 7:00 AM	1.1%	0.0%	19	0	19
7:00 - 8:00 AM	4.0%	0.7%	69	12	81
8:00 - 9:00 AM	13.2%	2.9%	225	49	274
9:00 - 10:00 AM	11.0%	4.0%	188	68	256
10:00 - 11:00 AM	10.0%	5.0%	171	86	257
11:00 - 12:00 AM	11.0%	8.0%	188	137	325
12:00 - 1:00 PM	12.6%	16.9%	216	289	505
1:00 - 2:00 PM	10.7%	9.0%	183	154	337
2:00 - 3:00 PM	8.4%	8.3%	144	142	286
3:00 - 4:00 PM	5.0%	8.5%	86	146	232
4:00 - 5:00 PM	4.1%	13.4%	70	229	299
5:00 - 6:00 PM	5.6%	13.7%	96	234	330
6:00 - 7:00 PM	3.1%	7.0%	53	120	173
7:00 - 8:00 PM	0.1%	2.1%	2	36	38
8:00 - 9:00 PM	0.1%	0.4%	2	7	9
9:00 - 10:00 PM	0.0%	0.2%	0	3	3
10:00 - 11:00 PM	0.0%	0.0%	0	0	0
DAILY	100.0%	100.0%	1712	1712	3424

(1) College Town temporal distribution derived from ITE Trip Generation projections Land Use Code 550 (University/College) and interpolated based on known operations.

SIGNAL WARRANTS #1A& #1B

ELMWOOD AVENUE @ EAST DRIVE

OPTION: MINOR STREET - WB LEFT-TURN

MAJOR STREET - EB APPROACH

WEEKDAY HOUR	FUTURE 2012 TRAFFIC			
	ELMWOOD AVENUE EB approach volume 2012	ELMWOOD AVENUE WB left-turn lane 2012	HOURS WARRANT #1A MET	HOURS WARRANT #1B MET
AM				
7:00-8:00	908	204	YES	YES
8:00-9:00	956	249	YES	YES
9:00-10:00	724	127	NO	NO
10:00-11:00	736	93	NO	NO
11:00-12:00	826	84	NO	NO
12:00 - 1:00	913	145	NO	YES
1:00 - 2:00	859	133	NO	NO
2:00 - 3:00	938	134	NO	YES
3:00 - 4:00	1149	83	NO	YES
4:00 - 5:00	1277	107	NO	YES
5:00 - 6:00	1270	70	NO	NO
6:00 - 7:00	832	53	NO	NO
7:00 - 8:00	678	51	NO	NO
8:00 - 9:00	551	42	NO	NO
9:00 - 10:00	477	29	NO	NO
WARRANT MET	---	---	NO	NO

WARRANT #1A - Minimum Vehicle Volume

WARRANT #1B - Interruption of Continuous Traffic

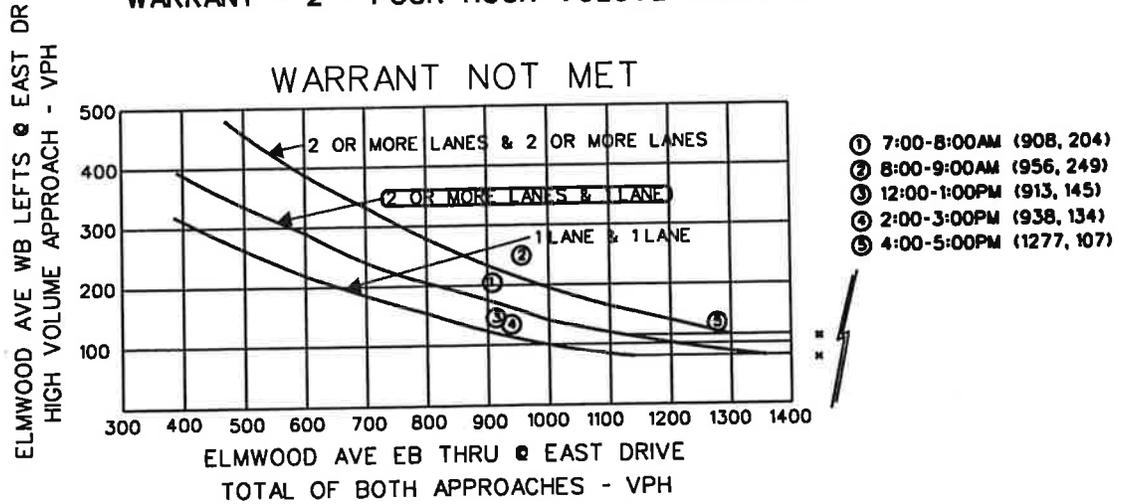
VOLUME WARRANT KEY

WARRANT NUMBER	HOURLY VOLUME REQUIRED FOR ANY 8 HOURS	
	Elmwood Avenue EB Approach	Elmwood Avenue WB Left-Turn Lane
#1A	600	150
#1B	900	75

ELMWOOD AVENUE @ EAST DRIVE

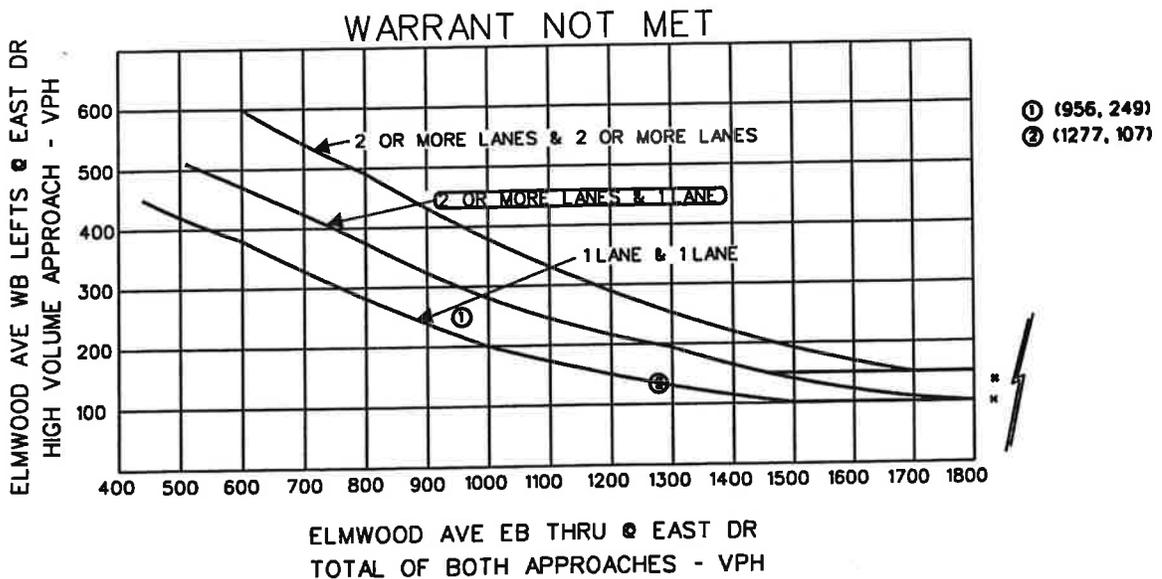
5 YEAR BUILD (2012)

WARRANT • 2 - FOUR HOUR VOLUME WARRANT



• NOTE: 115 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

WARRANT • 3 - PEAK HOUR VOLUME WARRANT



• NOTE: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

APPENDIX 'F'

Pedestrian Generator Check List

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PEDESTRIAN GENERATOR CHECKLIST

Note: The term generator in this document refers to both pedestrian generators (where pedestrians originate) and destinations (where pedestrians travel to) A check of yes indicates a potential need to accommodate pedestrians and coordination with the Regional Bicycle and Pedestrian Coordinator is necessary during project scoping. Answers to the following questions should be checked with the local municipality to ensure accuracy.

1.	Is there an existing or planned sidewalk, trail, or pedestrian crossing facility?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
2.	Are there bus stops, transit stations, or depots/terminals located in or within 800 m of the project area?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
3.	Is there more than occasional pedestrian activity? Evidence of pedestrian activity may include a worn path.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
4.	Are there existing or approved plans for generators of pedestrian activity in or within 800 m of the project that promote or have the potential to promote pedestrian traffic in the project area, such as schools, parks, playgrounds, places of employment, places of worship, post offices, municipal buildings, restaurants, shopping centers or other commercial areas, or multiuse paths?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
5.	Are there existing or approved plans for seasonal generators of pedestrian activity in or within 800 m of the project that promote or have the potential to promote pedestrian traffic in the project area, such as ski resorts, state parks, camps, amusement parks?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
6.	Is the project located in a residential area within 800 m of existing or planned pedestrian generators such as those listed in #4?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
7.	From record plans, were pedestrian facilities removed during a previous highway reconstruction project?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
8.	Did a study of secondary impacts indicate that the project promotes or is likely to promote commercial and/or residential development within the intended life cycle of the project?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
9.	Does the community's comprehensive plan call for development of pedestrian facilities in the area?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>

Note: This checklist should be revisited due to a project delay or if site conditions or local planning changes during the project development process.

APPENDIX 'G'

Traffic Count Summary Sheets

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Traffic Volume Comparison Summary Table - Overall

Intersection	AM Peak Hour			PM Peak Hour		
	Existing (2013 IPD) Overall Intersection Volume	12/2013 Counts Overall Intersection Volume	Percent Change w/ Existing Volume	Existing (2013 IPD) Overall Intersection Volume	12/2013 Counts Overall Intersection volume	Percent Change w/ Existing Volume
W. Henrietta and Southland Drive	2556	2250	-11.97%	3146	2856	-9.22%
W. Henrietta and Doncaster Road	2432	2201	-9.50%	3007	2703	-10.11%
East River Rd and Crittenden Rd	685	564	-17.66%	624	609	-2.40%

Traffic Volume Comparison Summary Table

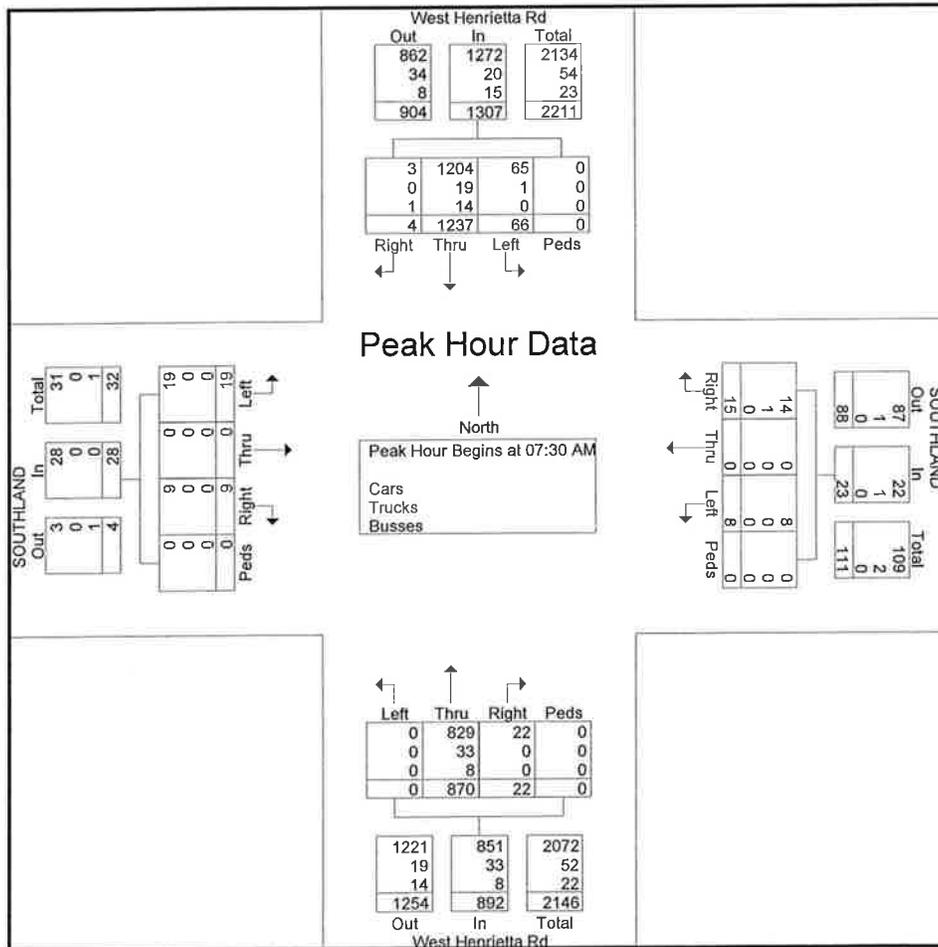
	AM Peak Hour			PM Peak Hour		
	Existing (2013 IPD) Overall Intersection Volume	12/2013 Counts Overall Intersection Volume	Percent Change w/ Existing Volume	Existing (2013 IPD) Overall Intersection Volume	12/2013 Counts Overall Intersection Volume	Percent Change w/ Existing Volume
W. Henrietta and Southland Drive						
EBL	34	19	-44%	9	9	0%
T	0	0	0%	0	0	0%
R	5	9	80%	18	6	-67%
WBL	7	8	14%	25	22	-12%
T	0	0	0%	0	0	0%
R	13	15	15%	116	62	-47%
NBL	1	0	-100%	6	2	-67%
T	1028	870	-15%	1452	1404	-3%
R	24	22	-8%	15	8	-47%
SBL	70	66	-6%	24	28	17%
T	1359	1237	-9%	1465	1300	-11%
R	<u>15</u>	<u>4</u>	<u>-73%</u>	<u>16</u>	<u>15</u>	<u>-6%</u>
Overall	2556	2250	-11.97%	3146	2856	-9.22%
W. Henrietta and Doncaster Road						
EBL	10	12	20%	3	2	-33%
T	0	3	0%	0	1	0%
R	0	4	0%	3	3	0%
WBL	3	2	-33%	14	2	-86%
T	2	0	-100%	0	0	0%
R	8	9	13%	13	7	-46%
NBL	1	1	0%	6	1	-83%
T	1035	864	-17%	1457	1416	-3%
R	2	3	50%	3	2	-33%
SBL	10	5	-50%	12	3	-75%
T	1356	1297	-4%	1480	1252	-15%
R	<u>5</u>	<u>1</u>	<u>-80%</u>	<u>16</u>	<u>14</u>	<u>-13%</u>
Overall	2432	2201	-9.50%	3007	2703	-10.11%
East River Road and Crittenden Road						
WBL	56	45	-20%	101	140	39%
R	8	8	0%	11	4	-64%
NBT	364	254	-30%	186	158	-15%
R	110	118	7%	34	35	3%
SBL	2	2	0%	12	4	-67%
T	<u>145</u>	<u>137</u>	<u>-6%</u>	<u>280</u>	<u>268</u>	<u>-4%</u>
Overall	685	564	-17.66%	624	609	-2.40%

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255 East Avenue
Rochester, NY 14604

File Name : West Henrietta Rd & Southland_BusinessDev
Site Code : 00000000
Start Date : 12/3/2013
Page No : 2

Start Time	West Henrietta Rd Southbound					SOUTHLAND Westbound					West Henrietta Rd Northbound					SOUTHLAND Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	1	344	14	0	359	4	0	1	0	5	4	224	0	0	228	2	0	8	0	10	602
07:45 AM	1	340	21	0	362	2	0	4	0	6	7	207	0	0	214	3	0	2	0	5	587
08:00 AM	2	289	19	0	310	4	0	3	0	7	9	216	0	0	225	1	0	6	0	7	549
08:15 AM	0	264	12	0	276	5	0	0	0	5	2	223	0	0	225	3	0	3	0	6	512
Total Volume	4	1237	66	0	1307	15	0	8	0	23	22	870	0	0	892	9	0	19	0	28	2250
% App. Total	0.3	94.6	5	0		65.2	0	34.8	0		2.5	97.5	0	0		32.1	0	67.9	0		
PHF	.500	.899	.786	.000	.903	.750	.000	.500	.000	.821	.611	.971	.000	.000	.978	.750	.000	.594	.000	.700	.934
Cars	3	1204																			
% Cars	75.0	97.3	98.5	0	97.3	93.3	0	100	0	95.7	100	95.3	0	0	95.4	100	0	100	0	100	96.6
Trucks	0	19	1	0	20	1	0	0	0	1	0	33	0	0	33	0	0	0	0	0	54
% Trucks	0	1.5	1.5	0	1.5	6.7	0	0	0	4.3	0	3.8	0	0	3.7	0	0	0	0	0	2.4
Busses	1	14	0	0	15	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	23
% Busses	25.0	1.1	0	0	1.1	0	0	0	0	0	0	0.9	0	0	0.9	0	0	0	0	0	1.0



T.Y. Lin International

255 East Avenue
Rochester, NY 14604

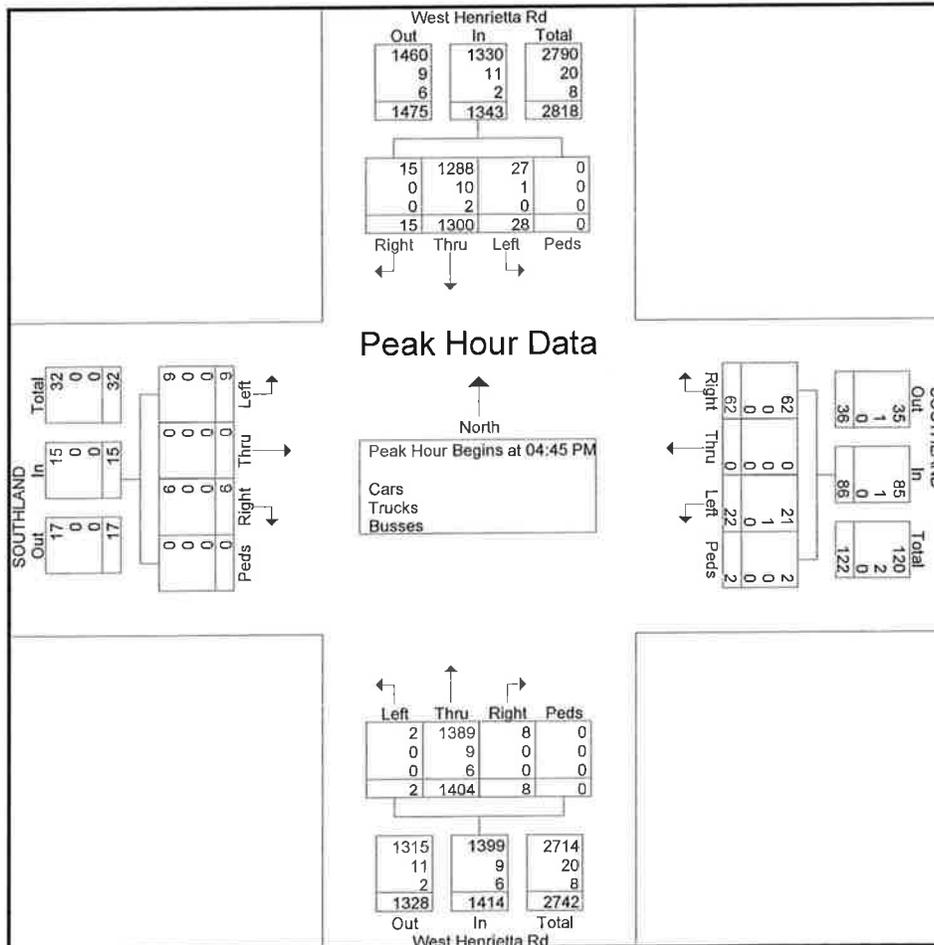
File Name : West Henrietta Rd & Southland_BusinessDev

Site Code : 00000000

Start Date : 12/3/2013

Page No : 3

Start Time	West Henrietta Rd Southbound					SOUTHLAND Westbound					West Henrietta Rd Northbound					SOUTHLAND Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:45 PM	4	330	7	0	341	14	0	5	0	19	3	395	1	0	399	1	0	1	0	2	761
05:00 PM	3	307	6	0	316	26	0	8	2	36	3	313	0	0	316	2	0	6	0	8	676
05:15 PM	5	338	9	0	352	11	0	4	0	15	2	343	0	0	345	0	0	0	0	0	712
05:30 PM	3	325	6	0	334	11	0	5	0	16	0	353	1	0	354	3	0	2	0	5	709
Total Volume	15	1300	28	0	1343	62	0	22	2	86	8	1404	2	0	1414	6	0	9	0	15	2858
% App. Total	1.1	96.8	2.1	0		72.1	0	25.6	2.3		0.6	99.3	0.1	0		40	0	60	0		
PHF	.750	.962	.778	.000	.954	.596	.000	.688	.250	.597	.667	.889	.500	.000	.886	.500	.000	.375	.000	.469	.939
Cars	15	1288									1389										
% Cars	100	99.1	96.4	0	99.0	100	0	95.5	100	98.8	100	98.9	100	0	98.9	100	0	100	0	100	99.0
Trucks	0	10	1	0	11	0	0	1	0	1	0	9	0	0	9	0	0	0	0	0	0
% Trucks	0	0.8	3.6	0	0.8	0	0	4.5	0	1.2	0	0.6	0	0	0.6	0	0	0	0	0	0.7
Busses	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	8
% Busses	0	0.2	0	0	0.1	0	0	0	0	0	0	0.4	0	0	0.4	0	0	0	0	0	0.3

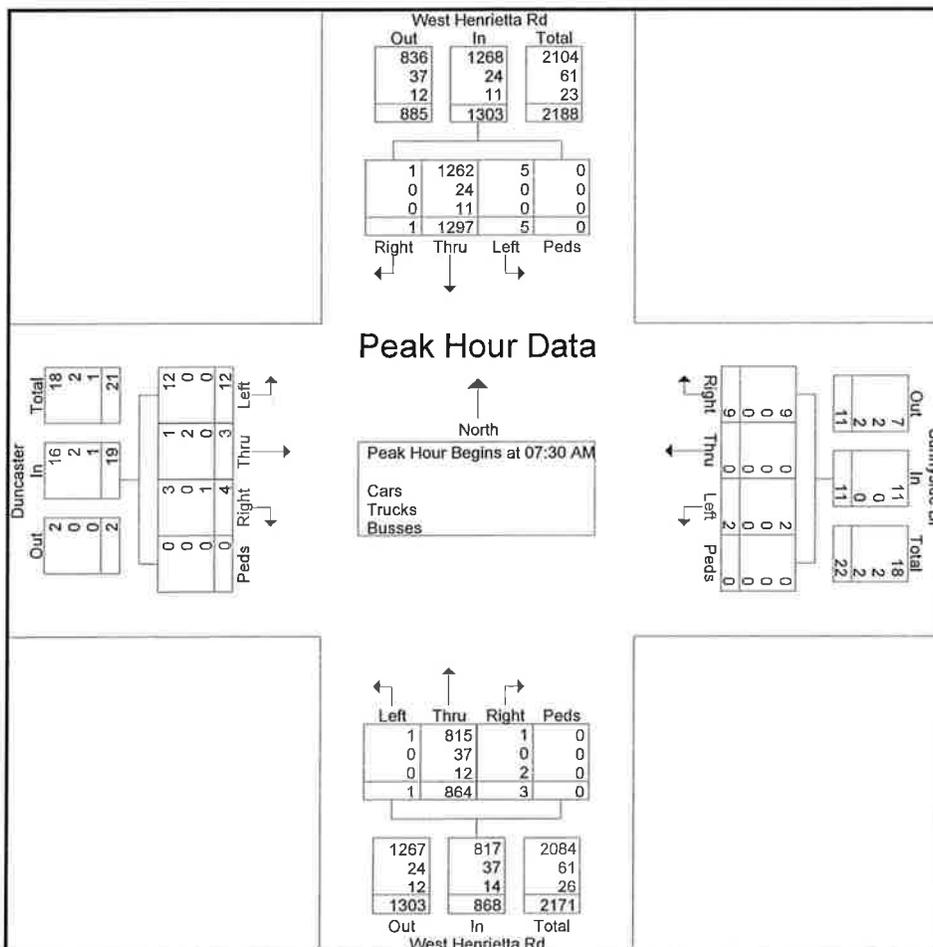


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255 East Avenue
Rochester, NY 14604

File Name : West Henrietta Rd & Doncaster_Sunnyside Dr
Site Code : 00000000
Start Date : 12/4/2013
Page No : 2

Start Time	West Henrietta Rd Southbound					Sunnyside Dr Westbound					West Henrietta Rd Northbound					Doncaster Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	320	0	0	320	1	0	1	0	2	0	218	0	0	218	2	1	2	0	5	545
07:45 AM	0	359	2	0	361	4	0	1	0	5	2	238	0	0	240	1	0	5	0	6	612
08:00 AM	1	340	1	0	342	3	0	0	0	3	0	210	1	0	211	0	0	1	0	1	557
08:15 AM	0	278	2	0	280	1	0	0	0	1	1	198	0	0	199	1	2	4	0	7	487
Total Volume	1	1297	5	0	1303	9	0	2	0	11	3	864	1	0	868	4	3	12	0	19	2201
% App. Total	0.1	99.5	0.4	0		81.8	0	18.2	0		0.3	99.5	0.1	0		21.1	15.8	63.2	0		
PHF	.250	.903	.625	.000	.902	.563	.000	.500	.000	.550	.375	.908	.250	.000	.904	.500	.375	.600	.000	.679	.899
Cars	1	1262																			
% Cars	100	97.3	100	0	97.3	100	0	100	0	100	33.3	94.3	100	0	94.1	75.0	33.3	100	0	84.2	96.0
Trucks	0	24	0	0	24	0	0	0	0	0	0	37	0	0	37	0	2	0	0	2	63
% Trucks	0	1.9	0	0	1.8	0	0	0	0	0	0	4.3	0	0	4.3	0	66.7	0	0	10.5	2.9
Busses	0	11	0	0	11	0	0	0	0	0	2	12	0	0	14	1	0	0	0	1	26
% Busses	0	0.8	0	0	0.8	0	0	0	0	0	66.7	1.4	0	0	1.6	25.0	0	0	0	5.3	1.2

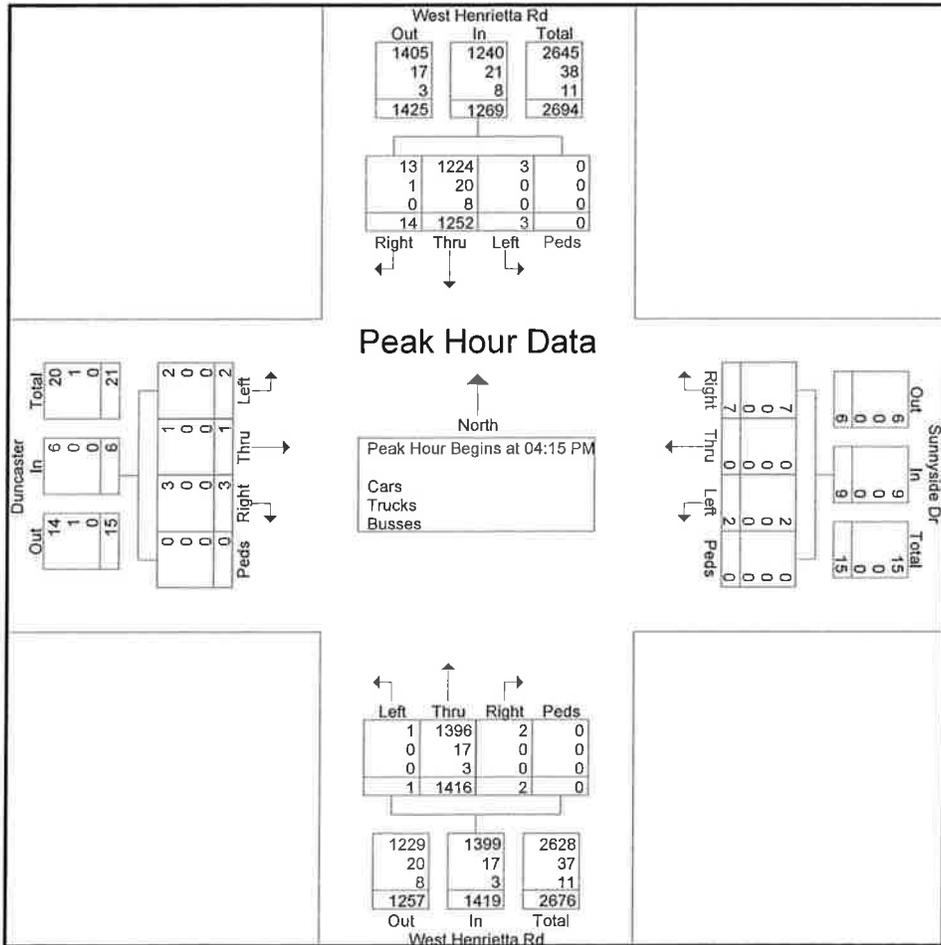


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255 East Avenue
Rochester, NY 14604

File Name : West Henrietta Rd & Doncaster_Sunnyside Dr
Site Code : 00000000
Start Date : 12/4/2013
Page No : 3

Start Time	West Henrietta Rd Southbound					Sunnyside Dr Westbound					West Henrietta Rd Northbound					Duncaster Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 12:00 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	4	264	1	0	269	0	0	0	0	0	0	352	0	0	352	0	0	0	0	0	621
04:30 PM	2	313	2	0	317	2	0	1	0	3	1	354	1	0	356	0	0	1	0	1	677
04:45 PM	4	351	0	0	355	4	0	1	0	5	0	353	0	0	353	1	1	1	0	3	716
05:00 PM	4	324	0	0	328	1	0	0	0	1	1	357	0	0	358	2	0	0	0	2	689
Total Volume	14	1252	3	0	1269	7	0	2	0	9	2	1416	1	0	1419	3	1	2	0	6	2703
% App. Total	1.1	98.7	0.2	0		77.8	0	22.2	0		0.1	99.8	0.1	0		50	16.7	33.3	0		
PHF	.875	.892	.375	.000	.894	.438	.000	.500	.000	.450	.500	.992	.250	.000	.991	.375	.250	.500	.000	.500	.944
Cars	13	1224										1396									
% Cars	92.9	97.8	100	0	97.7	100	0	100	0	100	100	98.6	100	0	98.6	100	100	100	0	100	98.2
Trucks	1	20	0	0	21	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	38
% Trucks	7.1	1.6	0	0	1.7	0	0	0	0	0	0	1.2	0	0	1.2	0	0	0	0	0	1.4
Busses	0	8	0	0	8	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	11
% Busses	0	0.6	0	0	0.6	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0.4

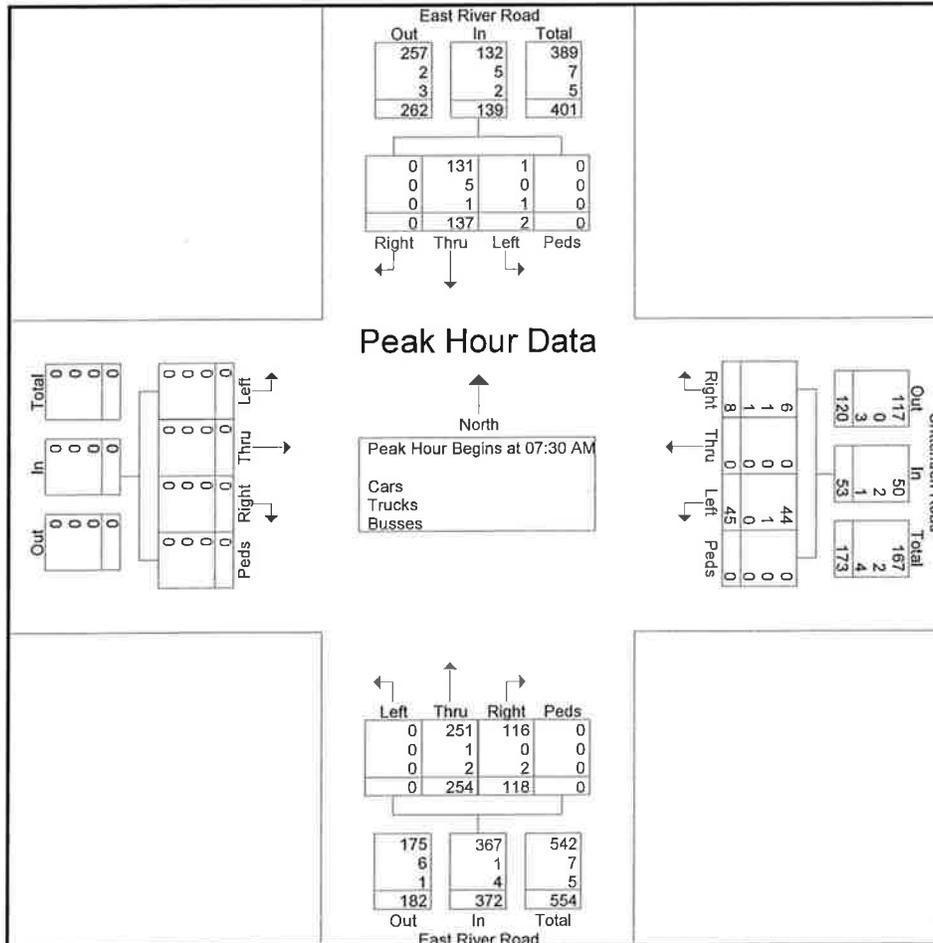


T.Y. Lin International

255 East Avenue
Rochester, NY 14604

File Name : East River Rd & Crittenden Rd AM Peak
Site Code : 00000000
Start Date : 12/3/2013
Page No : 2

Start Time	East River Road Southbound					Crittenden Road Westbound					East River Road Northbound					Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	29	0	0	29	2	0	9	0	11	38	70	0	0	108	0	0	0	0	0	148
07:45 AM	0	37	0	0	37	2	0	12	0	14	41	67	0	0	108	0	0	0	0	0	159
08:00 AM	0	34	2	0	36	2	0	19	0	21	23	65	0	0	88	0	0	0	0	0	145
08:15 AM	0	37	0	0	37	2	0	5	0	7	16	52	0	0	68	0	0	0	0	0	112
Total Volume	0	137	2	0	139	8	0	45	0	53	118	254	0	0	372	0	0	0	0	0	564
% App. Total	0	98.6	1.4	0		15.1	0	84.9	0		31.7	68.3	0	0		0	0	0	0		
PHF	.000	.926	.250	.000	.939	1.000	.000	.592	.000	.631	.720	.907	.000	.000	.861	.000	.000	.000	.000	.000	.887
Cars	0	131	1	0	132	6	0	44	0	50	116	251	0	0	367	0	0	0	0	0	549
% Cars	0	95.6	50.0	0	95.0	75.0	0	97.8	0	94.3	98.3	98.8	0	0	98.7	0	0	0	0	0	97.3
Trucks	0	5	0	0	5	1	0	1	0	2	0	1	0	0	1	0	0	0	0	0	8
% Trucks	0	3.6	0	0	3.6	12.5	0	2.2	0	3.8	0	0.4	0	0	0.3	0	0	0	0	0	1.4
Busses	0	1	1	0	2	1	0	0	0	1	2	2	0	0	4	0	0	0	0	0	7
% Busses	0	0.7	50.0	0	1.4	12.5	0	0	0	1.9	1.7	0.8	0	0	1.1	0	0	0	0	0	1.2

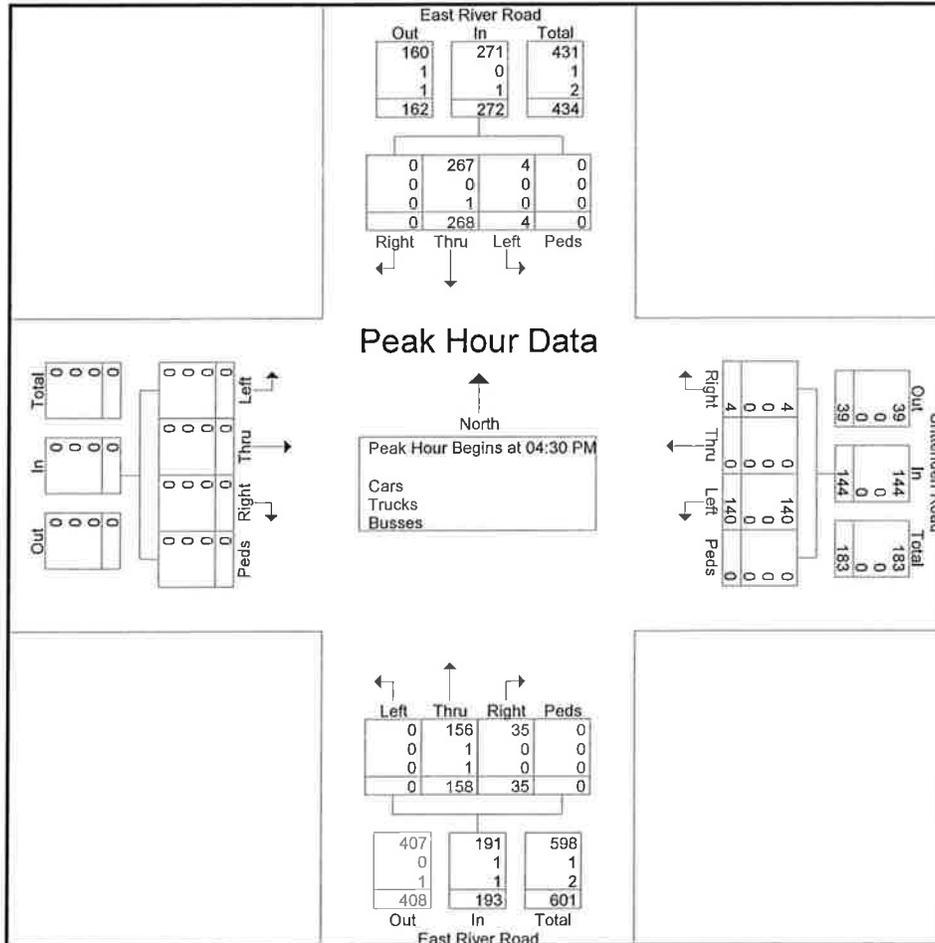


T.Y. Lin International

255 East Avenue
Rochester, NY 14604

File Name : East River Rd & Crittenden Rd PM Peak
Site Code : 00000000
Start Date : 12/3/2013
Page No : 2

Start Time	East River Road Southbound					Crittenden Road Westbound					East River Road Northbound					Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	62	0	0	62	0	0	28	0	28	12	36	0	0	48	0	0	0	0	0	138
04:45 PM	0	67	3	0	70	0	0	41	0	41	8	50	0	0	58	0	0	0	0	0	169
05:00 PM	0	76	0	0	76	3	0	36	0	39	8	45	0	0	53	0	0	0	0	0	168
05:15 PM	0	63	1	0	64	1	0	35	0	36	7	27	0	0	34	0	0	0	0	0	134
Total Volume	0	268	4	0	272	4	0	140	0	144	35	158	0	0	193	0	0	0	0	0	609
% App. Total	0	98.5	1.5	0		2.8	0	97.2	0		18.1	81.9	0	0		0	0	0	0		
PHF	.000	.882	.333	.000	.895	.333	.000	.854	.000	.878	.729	.790	.000	.000	.832	.000	.000	.000	.000	.000	.901
Cars	0	267	4	0	271	4	0	140	0	144	35	156	0	0	191	0	0	0	0	0	606
% Cars	0	99.6	100	0	99.6	100	0	100	0	100	100	98.7	0	0	99.0	0	0	0	0	0	99.5
Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0.5	0	0	0	0	0	0.2
Busses	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Busses	0	0.4	0	0	0.4	0	0	0	0	0	0	0.6	0	0	0.5	0	0	0	0	0	0.3





Department of Transportation

Monroe County, New York

Maggie Brooks
County Executive

Terrence J. Rice, P.E.
Director

MEMORANDUM

TO: Terrence J. Rice, P.E., Director of Transportation

FROM: James R. Pond, P.E., PTOE, Associate Traffic Engineer *JRP*

DATE: April 2, 2013

RE: **MONROE COUNTY TRAFFIC VOLUME TRENDS**

To help us in identifying appropriate traffic volume growth rates for traffic studies on County roads and City streets, we have evaluated historical traffic volume trends based on the Monroe County Traffic Summary Average Daily Traffic (ADT) counts taken in 2012. The calculated traffic volume trends for each Town and the City of Rochester over this time period are listed in Table 1.

The percent per year trend shown in Table 1 was calculated based on a linear regression through the ADT counts taken at each of our program count stations in 2012. The regression used the oldest available count during the 2001 to 2012 time period as the base, and only counts that were included in the 2012 machine count cycle were included in the calculations. The table has been sorted in descending order of trend by town, with the overall City/County values at the bottom.

In general, the data in Table 1 reflects a County-wide decline in traffic volume on County roads and City streets in every location except the Town of Pittsford. Possible reasons for this decline include the shrinking of Rochester's largest manufacturing sector employers, the ongoing economic downturn, an aging population, and continued high gas prices. The decline was first observed in the 2009 count cycle and was found again in 2012.

Because the longer term trend has been one of vehicular travel consistently increasing over time, the decreasing volume trend that we found may not extend into the future. If volumes do rebound, the percent increases could be relatively large because they would be coming from suppressed numbers. Therefore, although the data shown in Table 1 reflects a generally decreasing trend, we used the information as a way to predict potential future growth by location. To do this, we first assigned each locality to a "Growth Category" which serves to group together the locations that experienced similar volume trends. Growth Category 1 was assigned to locations that either gained or lost less than 1.0% of volume. Growth Category 2 was assigned to locations that lost from 1.0% to 2.0% of volume. Growth Category 3 was assigned to locations that lost from 2.0% to 3.0% of volume. Finally, Growth Category 4 was assigned to locations that lost more than 3.0% of volume. The thresholds were based on natural break points in the percentages.

MONROE COUNTY TRAFFIC VOLUME TRENDS

April 2, 2013

Page 2

Table 1 – Historical Traffic Volume Growth By Locality		
Locality	Traffic Volume Trend (% per year)	Assigned Growth Category (see explanation below)
Town of Pittsford	1.3	1
Town of Henrietta	-0.1	1
Town of Penfield	-0.4	1
Town of Riga	-0.6	1
Town of Mendon	-0.7	1
Town of Gates	-0.8	1
Town of Hamlin	-0.8	1
Town of Wheatland	-1.1	2
Town of Rush	-1.2	2
City of Rochester	-1.3	2
Town of Clarkson	-1.5	2
Town of Greece	-1.5	2
Town of Parma	-1.5	2
Town of Brighton	-1.6	2
Town of Ogden	-1.7	2
Town of Webster	-1.7	2
Town of Sweden	-1.9	2
Town of Perinton	-2.6	3
Town of Chili	-2.7	3
Town of Irondequoit	-4.2	4
City Only	-1.3	2
County Only (All Towns)	-1.5	2
City + County Combined	-1.5	2

The “Growth Category” indicates which locations either grew or had relatively small declines, as compared to others which declined faster. They are defined as follows:

- Growth Category 1 is assigned to locations that either gained or lost less than 1.0% of volume.
- Growth Category 2 is assigned to locations that lost from 1.0% to 2.0% of volume.
- Growth Category 3 is assigned to locations that lost from 2.0% to 3.0% of volume.
- Growth Category 4 is assigned to locations that lost more than 3.0% of volume.

MONROE COUNTY TRAFFIC VOLUME TRENDS

April 2, 2013

Page 3

The next step was to assign a representative linear growth rate for each category. A conservative value often used in the past was 1.5% of growth per year. We assigned this value to each location in Growth Category 1, where the volumes grew or held nearly steady during a period of general decline. For the remaining locations with declines, we assumed that the future growth would be increasingly less where the declines were increasingly greater. Values of 1.0% per year, 0.5% per year, and 0.5% per year were assigned to Growth Categories 2, 3, and 4 respectively. Note that a 0.0% growth rate would not allow for any additional vehicles, and a value of less than 0.0 % should never be used for a design because the facility would not have enough capacity when it is built.

The resulting recommended annual growth rates, in alphabetical order by locality name, are shown in Table 2. These growth rates are straight rates, and are not intended to be compounded.

Table 2 – Recommended Future Annual Growth Rates By Locality		
Locality	Assigned Growth Category (from Table 1)	Recommended Annual Straight Growth Rate (% per year)
Town of Brighton	2	1.0
Town of Chili	3	0.5
Town of Clarkson	2	1.0
Town of Gates	1	1.5
Town of Greece	2	1.0
Town of Hamlin	1	1.5
Town of Henrietta	1	1.5
Town of Irondequoit	4	0.5
Town of Mendon	1	1.5
Town of Ogden	2	1.0
Town of Parma	2	1.0
Town of Penfield	1	1.5
Town of Perinton	3	0.5
Town of Pittsford	1	1.5
Town of Riga	1	1.5
City of Rochester *	2	1.0 *
Town of Rush	2	1.0
Town of Sweden	2	1.0
Town of Webster	2	1.0
Town of Wheatland	2	1.0

* Judgment is needed when selecting an annual growth rate for City streets within the City of Rochester. Instead of using a uniform 1.0% per year rate throughout the City, the growth rate of the nearest adjacent suburb may be more appropriate. For areas on the west side, Gates' 1.5% per year may be appropriate. We also recommend 1.5% per year growth around the University of Rochester area. For areas on the northeast side, Irondequoit's 0.5% per year may be appropriate. 1.0% per year is suitable for the other areas within the City, including the CBD.

MONROE COUNTY TRAFFIC VOLUME TRENDS

April 2, 2013

Page 4

The recommended annual growth rates shown in Table 2 are appropriate for projecting future traffic volumes on County roads and City streets when more specific growth data is not available. As noted in the discussion above, they should be applied as straight annual growth rates and not compounded.

JRP/dph

cc: T. Rice

S. Leathersich

T. Frelier

B. Penwarden

B. Mansouri

K. Cox

R. Kozarits

H. Herdzik

T. Frys

R. Perrin, GTC

D. Goehring, NYSDOT

H:\Sub\T\TRAFFIC VOLUME TRENDS\County Volume Trends 2012 Summary jrp memo.doc



Planning | Designing | Building

Turning Movement Counts

File Name : East@Crittenden

Site Code : 00000000

Start Date : 2/1/2007

Page No : 1

Groups Printed- Cars - Trucks - Busses

Start Time	Southbound					Westbound					Northbound					Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	14	0	10	0	24	23	0	0	0	23	0	0	0	0	0	0	0	10	0	10	57
07:15 AM	16	0	6	0	22	23	0	0	0	23	0	0	0	0	0	0	0	7	0	7	52
07:30 AM	19	0	25	0	44	32	0	0	0	32	0	0	0	0	0	0	0	16	0	16	92
07:45 AM	25	0	18	0	43	42	0	0	0	42	0	0	0	0	0	0	0	16	0	16	101
Total	74	0	59	0	133	120	0	0	0	120	0	0	0	0	0	0	0	49	0	49	302
08:00 AM	25	0	21	0	46	32	0	0	0	32	0	0	0	0	0	0	0	16	0	16	94
08:15 AM	16	0	7	0	23	31	0	0	0	31	0	0	0	0	0	0	0	17	0	17	71
08:30 AM	19	0	13	0	32	23	0	0	0	23	0	0	0	0	0	0	0	9	0	9	64
08:45 AM	9	0	13	0	22	29	0	0	0	29	0	0	0	0	0	0	0	17	0	17	68
Total	69	0	54	0	123	115	0	0	0	115	0	0	0	0	0	0	0	59	0	59	297

*** BREAK ***

04:00 PM	23	0	25	0	48	20	0	0	0	20	0	0	0	0	0	0	0	17	0	17	85
04:15 PM	24	0	28	0	52	12	0	0	0	12	0	0	0	0	0	0	0	13	0	13	77
30 PM	25	0	23	0	48	19	0	0	0	19	0	0	0	0	0	0	0	9	0	9	76
45 PM	19	0	27	0	46	16	0	0	0	16	0	0	0	0	0	0	0	13	0	13	75
Total	91	0	103	0	194	67	0	0	0	67	0	0	0	0	0	0	0	52	0	52	313
05:00 PM	28	0	32	0	60	15	0	0	0	15	0	0	0	0	0	0	0	15	0	15	90
05:15 PM	25	0	33	0	58	19	0	0	0	19	0	0	0	0	0	0	0	15	0	15	92
05:30 PM	22	0	31	0	53	8	0	0	0	8	0	0	0	0	0	0	0	15	0	15	76
05:45 PM	7	0	21	0	28	11	0	0	0	11	0	0	0	0	0	0	0	5	0	5	44
Total	82	0	117	0	199	53	0	0	0	53	0	0	0	0	0	0	0	50	0	50	302
Grand Total	316	0	333	0	649	355	0	0	0	355	0	0	0	0	0	0	0	210	0	210	1214
Apprch %	48.7	0	51.3	0		100	0	0	0		0	0	0	0	0	0	0	100	0		
Total %	26	0	27.4	0	53.5	29.2	0	0	0	29.2	0	0	0	0	0	0	0	17.3	0	17.3	
Cars	281	0	325	0	606	350	0	0	0	350	0	0	0	0	0	0	0	206	0	206	1162
% Cars	88.9	0	97.6	0	93.4	98.6	0	0	0	98.6	0	0	0	0	0	0	0	98.1	0	98.1	95.7
Trucks	1	0	3	0	4	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	6
% Trucks	0.3	0	0.9	0	0.6	0.6	0	0	0	0.6	0	0	0	0	0	0	0	0	0	0	0.5
Busses	34	0	5	0	39	3	0	0	0	3	0	0	0	0	0	0	0	4	0	4	46
% Busses	10.8	0	1.5	0	6	0.8	0	0	0	0.8	0	0	0	0	0	0	0	1.9	0	1.9	3.8

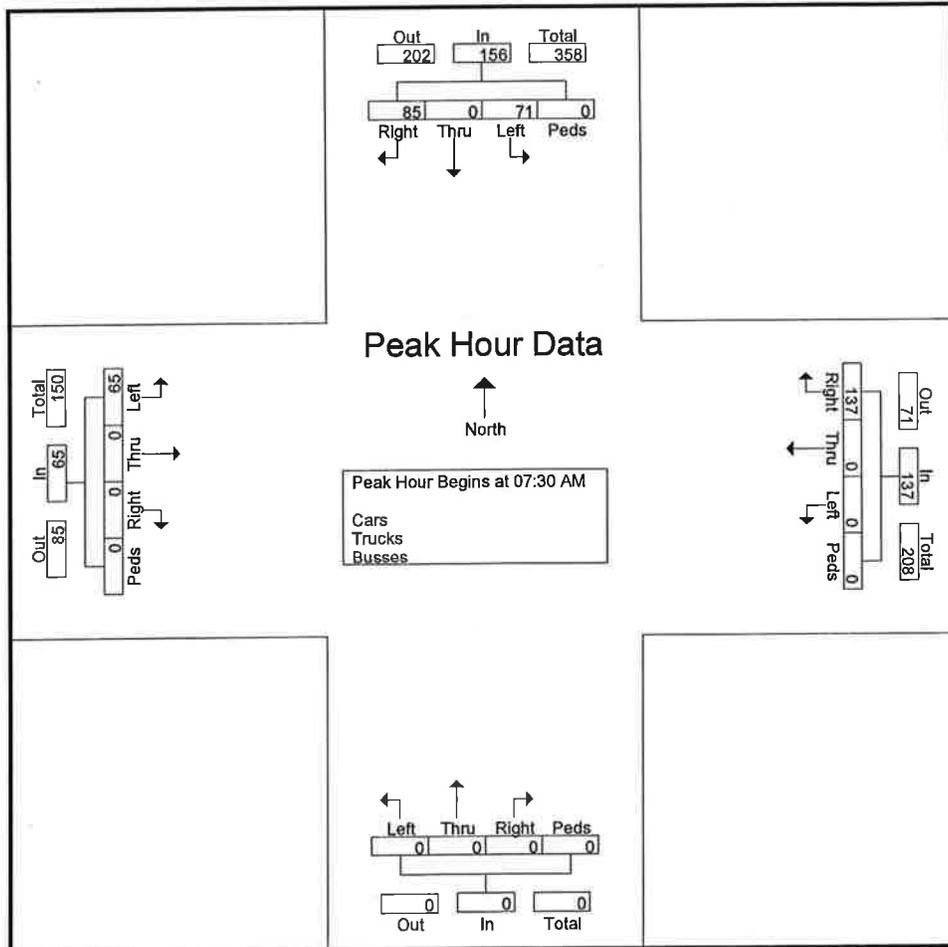


Planning | Designing | Building

Turning Movement Counts

File Name : East@Crittenden
 Site Code : 00000000
 Start Date : 2/1/2007
 Page No : 2

Start Time	Southbound					Westbound					Northbound					Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	19	0	25	0	44	32	0	0	0	32	0	0	0	0	0	0	0	16	0	16	92
07:45 AM	25	0	18	0	43	42	0	0	0	42	0	0	0	0	0	0	0	16	0	16	101
08:00 AM	25	0	21	0	46	32	0	0	0	32	0	0	0	0	0	0	0	16	0	16	94
08:15 AM	16	0	7	0	23	31	0	0	0	31	0	0	0	0	0	0	0	17	0	17	71
Total Volume	85	0	71	0	156	137	0	0	0	137	0	0	0	0	0	0	0	65	0	65	358
% App. Total	54.5	0	45.5	0		100	0	0	0		0	0	0	0		0	0	100	0		
PHF	.850	.000	.710	.000	.848	.815	.000	.000	.000	.815	.000	.000	.000	.000	.000	.000	.000	.956	.000	.956	.886





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Turning Movement Counts

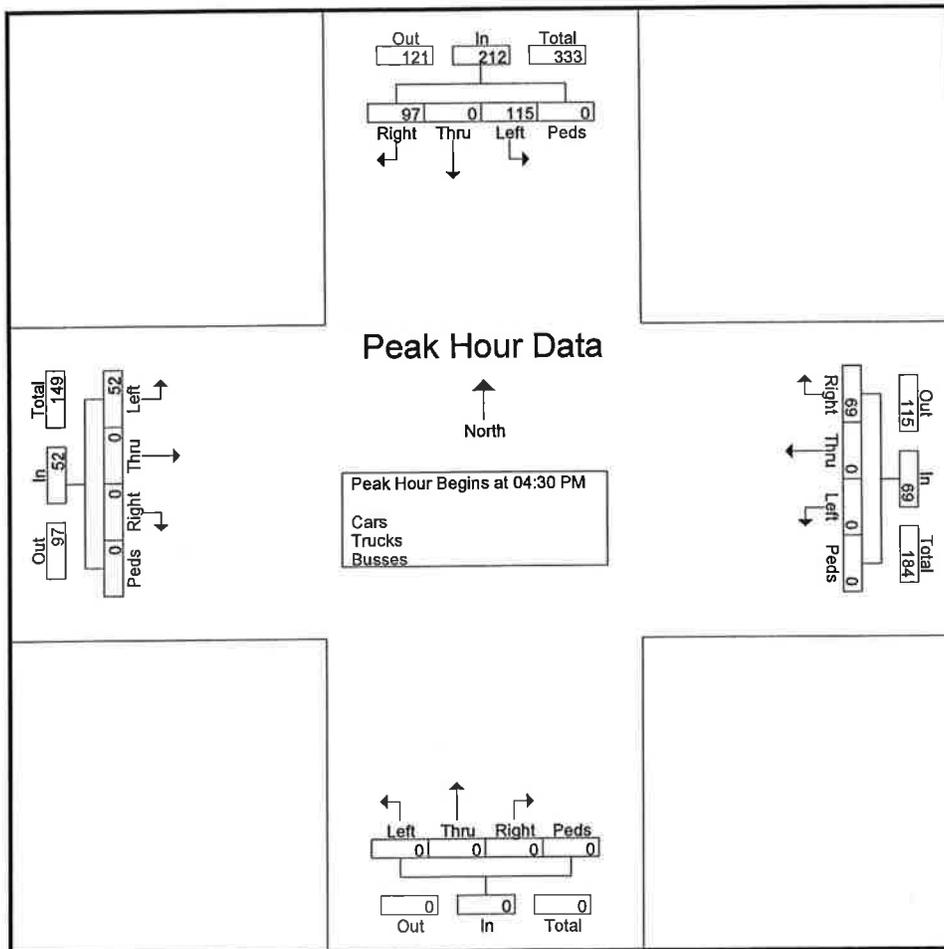
File Name : East@Crittenden

Site Code : 00000000

Start Date : 2/1/2007

Page No : 3

Start Time	Southbound					Westbound					Northbound					Eastbound					
	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Right	Thr u	Left	Peds	App. Total	Right	Thr u	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	25	0	23	0	48	19	0	0	0	19	0	0	0	0	0	0	0	9	0	9	76
04:45 PM	19	0	27	0	46	16	0	0	0	16	0	0	0	0	0	0	0	13	0	13	75
05:00 PM	28	0	32	0	60	15	0	0	0	15	0	0	0	0	0	0	0	15	0	15	90
05:15 PM	25	0	33	0	58	19	0	0	0	19	0	0	0	0	0	0	0	15	0	15	92
Total Volume	97	0	115	0	212	69	0	0	0	69	0	0	0	0	0	0	0	52	0	52	333
% App. Total	45.8	0	54.2	0		100	0	0	0		0	0	0	0		0	0	100	0		
PHF	.866	.000	.871	.000	.883	.908	.000	.000	.000	.908	.000	.000	.000	.000	.000	.000	.867	.000	.867	.905	



FRA, a TY Lin Internation Company
 530 Summit Point Drive
 Rochester, NY 14467

File Name : East@Elmwood
 Site Code : 00000000
 Start Date : 2/1/2007
 Page No : 1

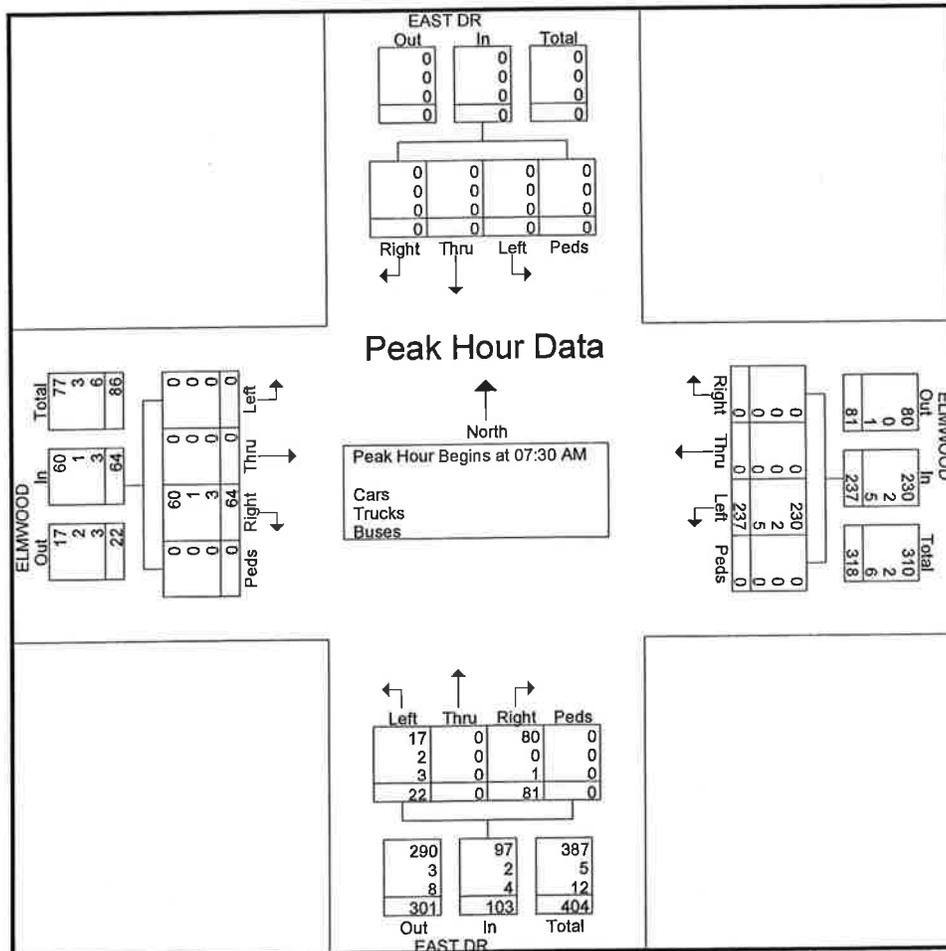
Groups Printed- Cars - Trucks - Buses

Start Time	EAST DR Southbound					ELMWOOD Westbound					EAST DR Northbound					ELMWOOD Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	0	0	0	0	0	31	0	0	0	31	2	0	6	0	8	0	0	13	0	13	52
07:15 AM	0	0	0	0	0	43	0	0	0	43	6	0	19	0	25	0	0	15	0	15	83
07:30 AM	0	0	0	0	0	55	0	0	0	55	4	0	21	0	25	0	0	14	0	14	94
07:45 AM	0	0	0	0	0	58	0	0	0	58	7	0	22	0	29	0	0	21	0	21	108
Total	0	0	0	0	0	187	0	0	0	187	19	0	68	0	87	0	0	63	0	63	337
08:00 AM	0	0	0	0	0	69	0	0	0	69	4	0	24	0	28	0	0	14	0	14	111
08:15 AM	0	0	0	0	0	55	0	0	0	55	7	0	14	0	21	0	0	15	0	15	91
08:30 AM	0	0	0	0	0	58	0	0	0	58	4	0	11	0	15	0	0	15	0	15	88
08:45 AM	0	0	0	0	0	45	0	0	0	45	8	0	11	0	19	0	0	12	0	12	76
Total	0	0	0	0	0	227	0	0	0	227	23	0	60	0	83	0	0	56	0	56	366
*** BREAK ***																					
04:00 PM	0	0	0	0	0	17	0	0	0	17	18	0	32	0	50	0	0	12	0	12	79
04:15 PM	0	0	0	0	0	21	0	0	0	21	9	0	31	0	40	0	0	12	0	12	73
04:30 PM	0	0	0	0	0	18	0	0	0	18	14	0	35	0	49	0	0	10	0	10	77
04:45 PM	0	0	0	0	0	24	0	0	0	24	13	0	35	0	48	0	0	11	0	11	83
Total	0	0	0	0	0	80	0	0	0	80	54	0	133	0	187	0	0	45	0	45	312
05:00 PM	0	0	0	0	0	14	0	0	0	14	14	0	42	0	56	0	0	14	0	14	84
05:15 PM	0	0	0	0	0	17	0	0	0	17	14	0	44	0	58	0	0	3	0	3	78
05:30 PM	0	0	0	0	0	14	0	0	0	14	11	0	40	0	51	0	0	9	0	9	74
05:45 PM	0	0	0	0	0	10	0	0	0	10	9	0	24	0	33	0	0	5	0	5	48
Total	0	0	0	0	0	55	0	0	0	55	48	0	150	0	198	0	0	31	0	31	284
Grand Total	0	0	0	0	0	549	0	0	0	549	144	0	411	0	555	0	0	195	0	195	1299
Approch %	0	0	0	0	0	100	0	0	0	100	25.9	0	74.1	0	100	0	0	100	0	100	
Total %	0	0	0	0	0	42.3	0	0	0	42.3	11.1	0	31.6	0	42.7	0	0	15	0	15	
Cars	0	0	0	0	0	527	0	0	0	527	137	0	410	0	547	0	0	171	0	171	1245
% Cars	0	0	0	0	0	96	0	0	0	96	95.1	0	99.8	0	98.6	0	0	87.7	0	87.7	95.8
Trucks	0	0	0	0	0	3	0	0	0	3	3	0	0	0	3	0	0	5	0	5	11
% Trucks	0	0	0	0	0	0.5	0	0	0	0.5	2.1	0	0	0	0.5	0	0	2.6	0	2.6	0.8
Buses	0	0	0	0	0	19	0	0	0	19	4	0	1	0	5	0	0	19	0	19	43
% Buses	0	0	0	0	0	3.5	0	0	0	3.5	2.8	0	0.2	0	0.9	0	0	9.7	0	9.7	3.3

FRA, a TY Lin Internation Company
 530 Summit Point Drive
 Rochester, NY 14467

File Name : East@Elmwood
 Site Code : 00000000
 Start Date : 2/1/2007
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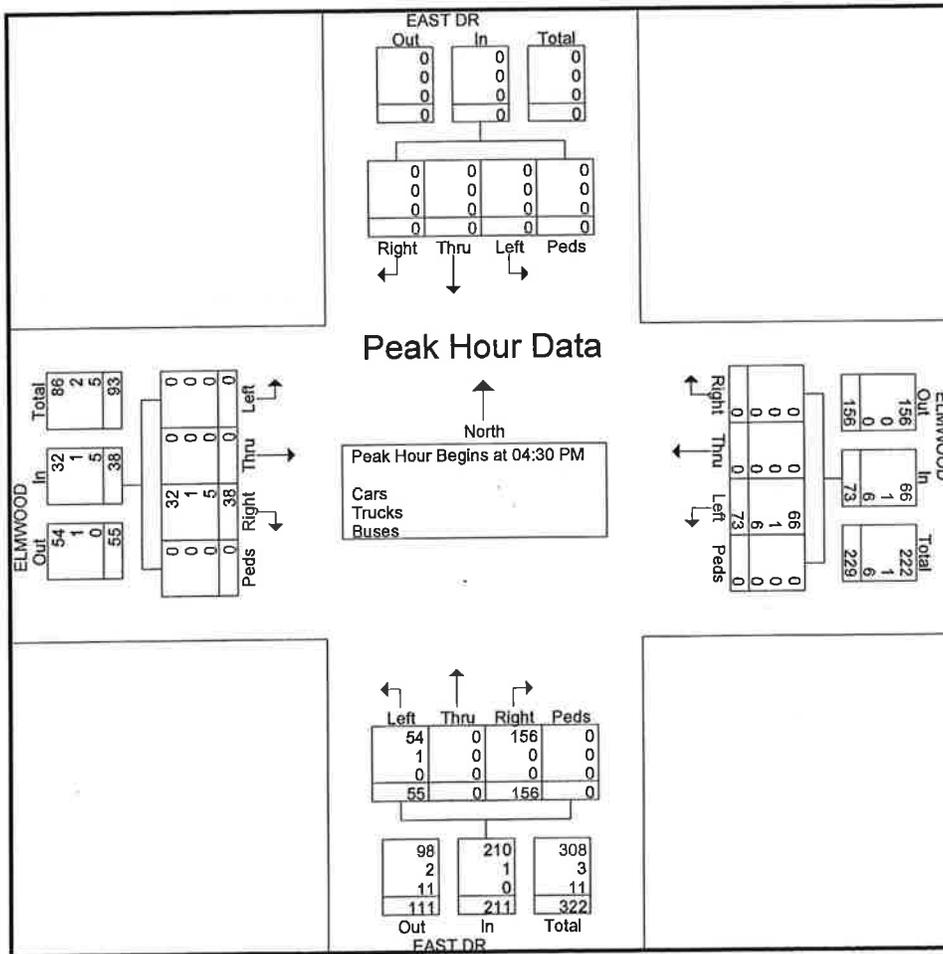
Start Time	EAST DR Southbound					ELMWOOD Westbound					EAST DR Northbound					ELMWOOD Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	55	0	0	0	55	4	0	21	0	25	0	0	14	0	14	94
07:45 AM	0	0	0	0	0	58	0	0	0	58	7	0	22	0	29	0	0	21	0	21	108
08:00 AM	0	0	0	0	0	69	0	0	0	69	4	0	24	0	28	0	0	14	0	14	111
08:15 AM	0	0	0	0	0	55	0	0	0	55	7	0	14	0	21	0	0	15	0	15	91
Total Volume	0	0	0	0	0	237	0	0	0	237	22	0	81	0	103	0	0	64	0	64	404
% App. Total	0	0	0	0	0	100	0	0	0	100	21.4	0	78.6	0	100	0	0	100	0	100	91
PHF	.000	.000	.000	.000	.000	.859	.000	.000	.000	.859	.786	.000	.844	.000	.888	.000	.000	.762	.000	.762	.910
Cars	0	0	0	0	0	230	0	0	0	230	17	0	80	0	97	0	0	60	0	60	387
% Cars	0	0	0	0	0	97.0	0	0	0	97.0	77.3	0	98.8	0	94.2	0	0	93.8	0	93.8	95.8
Trucks	0	0	0	0	0	2	0	0	0	2	2	0	0	0	2	0	0	1	0	1	5
% Trucks	0	0	0	0	0	0.8	0	0	0	0.8	9.1	0	0	0	1.9	0	0	1.6	0	1.6	1.2
Buses	0	0	0	0	0	5	0	0	0	5	3	0	1	0	4	0	0	3	0	3	12
% Buses	0	0	0	0	0	2.1	0	0	0	2.1	13.6	0	1.2	0	3.9	0	0	4.7	0	4.7	3.0



FRA, a TY Lin Internation Company
 530 Summit Point Drive
 Rochester, NY 14467

File Name : East@Elmwood
 Site Code : 00000000
 Start Date : 2/1/2007
 Page No : 3

Start Time	EAST DR Southbound					ELMWOOD Westbound					EAST DR Northbound					ELMWOOD Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	18	0	0	0	18	14	0	35	0	49	0	0	10	0	10	77
04:45 PM	0	0	0	0	0	24	0	0	0	24	13	0	35	0	48	0	0	11	0	11	83
05:00 PM	0	0	0	0	0	14	0	0	0	14	14	0	42	0	56	0	0	14	0	14	84
05:15 PM	0	0	0	0	0	17	0	0	0	17	14	0	44	0	58	0	0	3	0	3	78
Total Volume	0	0	0	0	0	73	0	0	0	73	55	0	156	0	211	0	0	38	0	38	322
% App. Total	0	0	0	0	0	100	0	0	0	100	26.1	0	73.9	0	100	0	0	100	0	100	
PHF	.000	.000	.000	.000	.000	.760	.000	.000	.000	.760	.982	.000	.886	.000	.909	.000	.000	.679	.000	.679	.958
Cars	0	0	0	0	0	66	0	0	0	66	54	0	156	0	210	0	0	32	0	32	308
% Cars	0	0	0	0	0	90.4	0	0	0	90.4	98.2	0	100	0	99.5	0	0	84.2	0	84.2	95.7
Trucks	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	1	0	1	3
% Trucks	0	0	0	0	0	1.4	0	0	0	1.4	1.8	0	0	0	0.5	0	0	2.6	0	2.6	0.9
Buses	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	0	0	5	0	5	11
% Buses	0	0	0	0	0	8.2	0	0	0	8.2	0	0	0	0	0	0	0	13.2	0	13.2	3.4



IRA ENGINEERING, PC

530 Summit Point Drive
Henrietta, NY 14467

File Name : E. Hen & Westfall_AM_All legs
Site Code : 00000000
Start Date : 11/17/2006
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

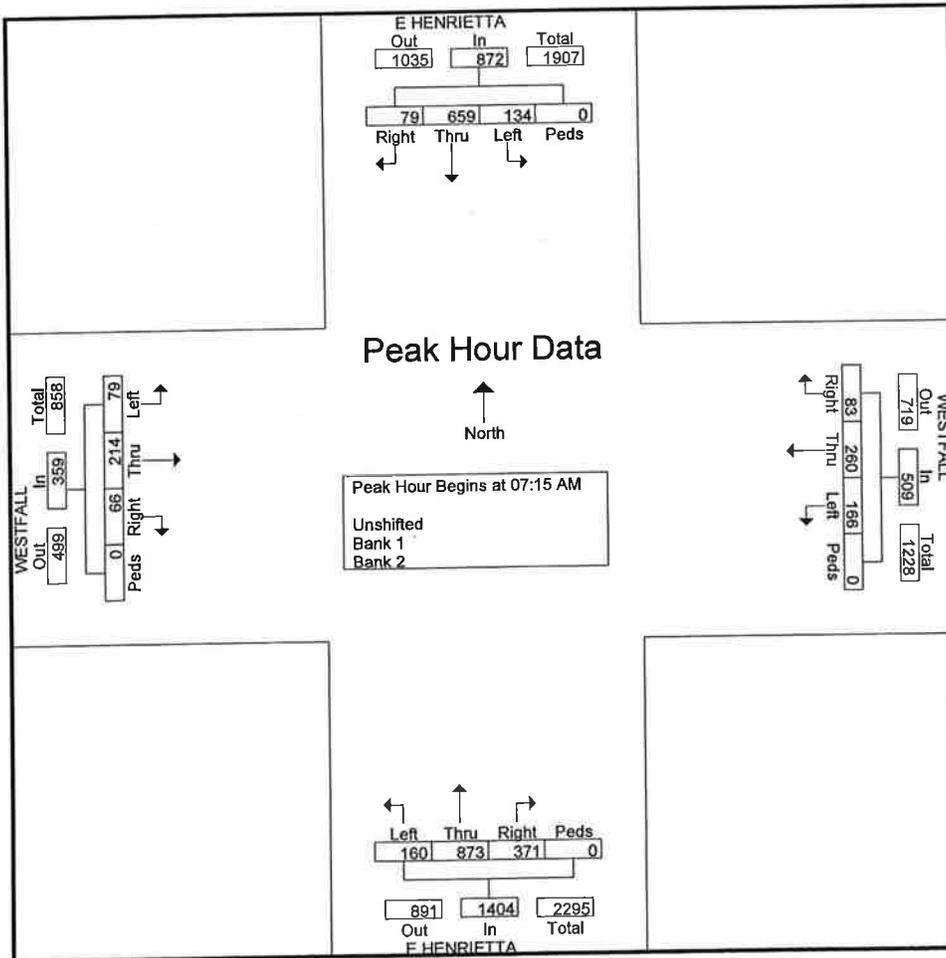
Start Time	E HENRIETTA Southbound					WESTFALL Westbound					E HENRIETTA Northbound					WESTFALL Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	13	132	33	0	178	16	48	38	0	102	43	159	23	0	225	5	35	12	0	52	557
07:15 AM	18	144	38	0	200	13	56	46	0	115	91	244	38	0	373	11	43	16	0	70	758
07:30 AM	20	154	29	0	203	23	66	44	0	133	109	218	51	0	378	22	63	13	0	98	812
07:45 AM	17	174	33	0	224	23	66	42	0	131	93	210	35	0	338	22	59	23	0	104	797
Total	68	604	133	0	805	75	236	170	0	481	336	831	147	0	1314	60	200	64	0	324	2924
08:00 AM	24	187	34	0	245	24	72	34	0	130	78	201	36	0	315	11	49	27	0	87	777
08:15 AM	27	187	27	0	241	28	81	35	0	144	42	83	17	0	142	4	26	12	0	42	569
08:30 AM	22	188	44	0	254	16	70	50	0	136	92	190	47	0	329	17	51	20	0	88	807
08:45 AM	21	165	28	0	214	25	58	45	0	128	95	210	45	0	350	26	58	27	0	111	803
Total	94	727	133	0	954	93	281	164	0	538	307	684	145	0	1136	58	184	86	0	328	2956
Grand Total	162	1331	266	0	1759	168	517	334	0	1019	643	1515	292	0	2450	118	384	150	0	652	5880
Apprch %	9.2	75.7	15.1	0		16.5	50.7	32.8	0		26.2	61.8	11.9	0		18.1	58.9	23	0		
Total %	2.8	22.6	4.5	0	29.9	2.9	8.8	5.7	0	17.3	10.9	25.8	5	0	41.7	2	6.5	2.6	0	11.1	
Unshifted	159	1277	257	0	1693	163	499	318	0	980	635	1446	290	0	2371	112	370	142	0	624	5668
% Unshifted	98.1	95.9	96.6	0	96.2	97	96.5	95.2	0	96.2	98.8	95.4	99.3	0	96.8	94.9	96.4	94.7	0	95.7	96.4
Bank 1	1	31	4	0	36	1	6	12	0	19	3	34	2	0	39	1	7	1	0	9	103
% Bank 1	0.6	2.3	1.5	0	2	0.6	1.2	3.6	0	1.9	0.5	2.2	0.7	0	1.6	0.8	1.8	0.7	0	1.4	1.8
Bank 2	2	23	5	0	30	4	12	4	0	20	5	35	0	0	40	5	7	7	0	19	109
% Bank 2	1.2	1.7	1.9	0	1.7	2.4	2.3	1.2	0	2	0.8	2.3	0	0	1.6	4.2	1.8	4.7	0	2.9	1.9

TRA ENGINEERING, PC

530 Summit Point Drive
Henrietta, NY 14467

File Name : E. Hen & Westfall_AM_All legs
Site Code : 00000000
Start Date : 11/17/2006
Page No : 2

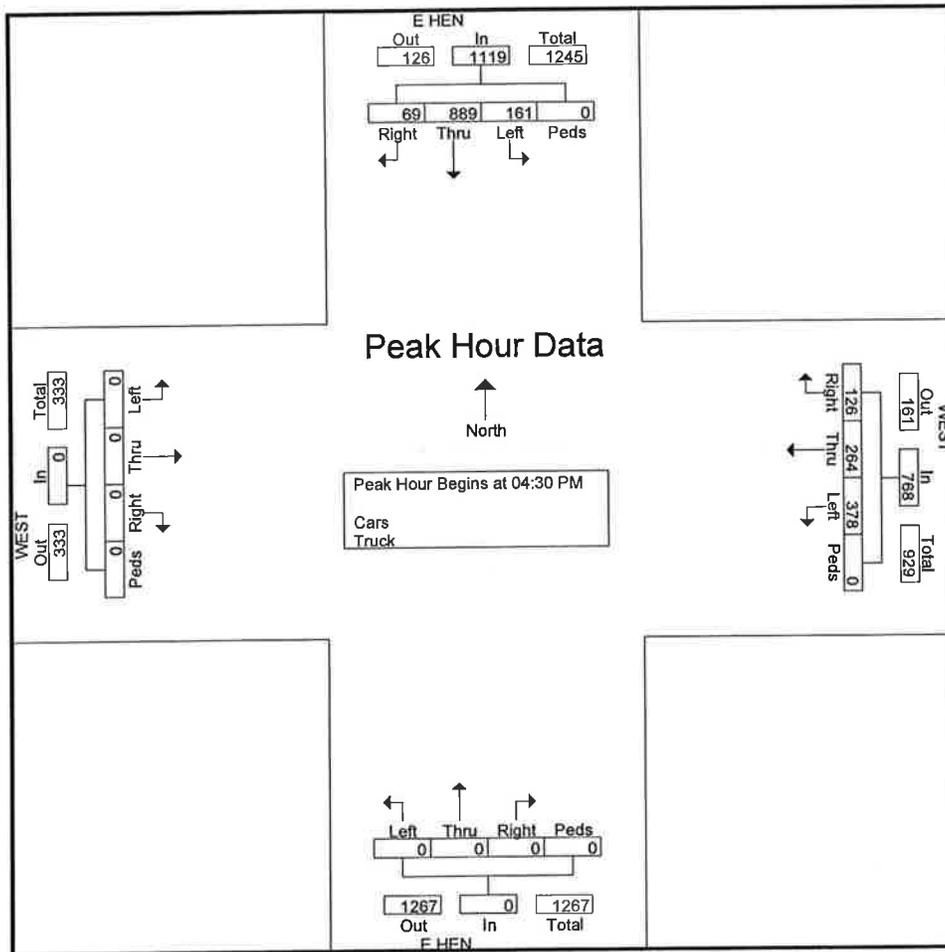
Start Time	E HENRIETTA Southbound					WESTFALL Westbound					E HENRIETTA Northbound					WESTFALL Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	18	144	38	0	200	13	56	46	0	115	91	244	38	0	373	11	43	16	0	70	758
07:30 AM	20	154	29	0	203	23	66	44	0	133	109	218	51	0	378	22	63	13	0	98	812
07:45 AM	17	174	33	0	224	23	66	42	0	131	93	210	35	0	338	22	59	23	0	104	797
08:00 AM	24	187	34	0	245	24	72	34	0	130	78	201	36	0	315	11	49	27	0	87	777
Total Volume	79	659	134	0	872	83	260	166	0	509	371	873	160	0	1404	66	214	79	0	359	3144
% App. Total	9.1	75.6	15.4	0		16.3	51.1	32.6	0		26.4	62.2	11.4	0		18.4	59.6	22	0		
PHF	.823	.881	.882	.000	.890	.865	.903	.902	.000	.957	.851	.894	.784	.000	.929	.750	.849	.731	.000	.863	.968



FRA, a TY Lin Internation Company
 530 Summit Point Drive
 Rochester, NY 14467

File Name : E. Hen & Westfall_PM_SW
 Site Code : 00000000
 Start Date : 11/17/2006
 Page No : 2

Start Time	E HEN Southbound					WEST Westbound					E HEN Northbound					WEST Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	30	224	14	0	268	111	82	23	0	216	0	0	0	0	0	0	0	0	0	0	484
04:45 PM	54	230	26	0	310	86	67	39	0	192	0	0	0	0	0	0	0	0	0	0	502
05:00 PM	37	213	18	0	268	103	64	38	0	205	0	0	0	0	0	0	0	0	0	0	473
05:15 PM	40	222	11	0	273	78	51	26	0	155	0	0	0	0	0	0	0	0	0	0	428
Total Volume	161	889	69	0	1119	378	264	126	0	768	0	0	0	0	0	0	0	0	0	0	1887
% App. Total																					
PHF	.745	.966	.663	.000	.902	.851	.805	.808	.000	.889	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.940

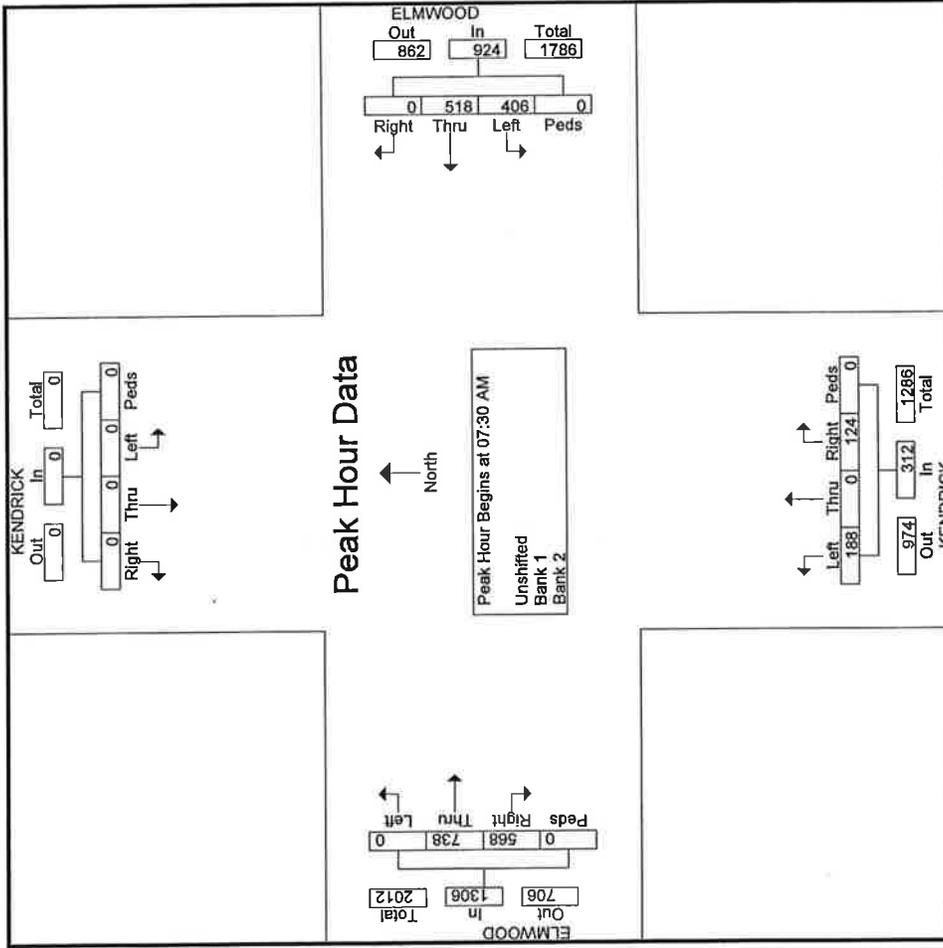


FBI E.M.G. J.W.E.F.R.I.N.G., PC

530 Summit Drive
Henrietta, N.Y. 14467

File Name : Elmwood and Kendrick 11-15-06 AM
Site Code : 00000000
Start Date : 11/15/2006
Page No : 1

Start Time	Groups Printed- Unshifted - Bank 1 - Bank 2												Int. Total							
	KENDRICK Southbound				ELMWOOD Westbound				KENDRICK Northbound					ELMWOOD Eastbound						
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru		Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total
07:00 AM	0	0	0	0	0	0	84	43	0	127	19	0	35	0	54	68	109	0	0	177
07:15 AM	0	0	0	0	0	0	99	74	0	173	18	0	29	0	47	112	165	0	0	277
07:30 AM	0	0	0	0	0	0	127	88	0	215	27	0	39	0	66	164	172	0	0	336
07:45 AM	0	0	0	0	0	0	142	131	0	273	31	0	40	0	71	171	199	0	0	370
Total	0	0	0	0	0	0	452	336	0	788	95	0	143	0	238	515	645	0	0	1160
08:00 AM	0	0	0	0	0	0	134	99	0	233	32	0	61	0	93	121	212	0	0	333
08:15 AM	0	0	0	0	0	0	115	88	0	203	34	0	48	0	82	112	155	0	0	267
08:30 AM	0	0	0	0	0	0	143	65	0	208	38	0	48	0	86	112	179	0	0	291
08:45 AM	0	0	0	0	0	0	117	50	0	167	20	0	52	0	72	104	147	0	0	251
Total	0	0	0	0	0	0	509	302	0	811	124	0	209	0	333	449	693	0	0	1142
Grand Total	0	0	0	0	0	0	961	638	0	1599	219	0	352	0	571	964	1338	0	0	2302
Approch %	0	0	0	0	0	0	60.1	39.9	0	35.8	38.4	0	61.6	0	12.8	41.9	58.1	0	0	51.5
Total %	0	0	0	0	0	0	21.5	14.3	0	35.8	4.9	0	7.9	0	12.8	21.6	29.9	0	0	51.5
Unshifted	0	0	0	0	0	0	930	636	0	1566	214	0	321	0	535	928	1277	0	0	2205
% Unshifted	0	0	0	0	0	0	96.8	99.7	0	97.9	97.7	0	91.2	0	93.7	96.3	95.4	0	0	95.8
Bank 1	0	0	0	0	0	0	8	1	0	9	3	0	6	0	9	6	25	0	0	31
% Bank 1	0	0	0	0	0	0	0.8	0.2	0	0.6	1.4	0	1.7	0	1.6	0.6	1.9	0	0	1.3
Bank 2	0	0	0	0	0	0	23	1	0	24	2	0	25	0	27	30	36	0	0	66
% Bank 2	0	0	0	0	0	0	2.4	0.2	0	1.5	0.9	0	7.1	0	4.7	3.1	2.7	0	0	2.9



TRA ENGINEERING, PC

530 Summit Point Drive
Henrietta, NY 14467

File Name : Elm-South_AM_All Legs
Site Code : 00000000
Start Date : 11/17/2006
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Groups Printed- Unshifted - Bank 1 - Bank 2

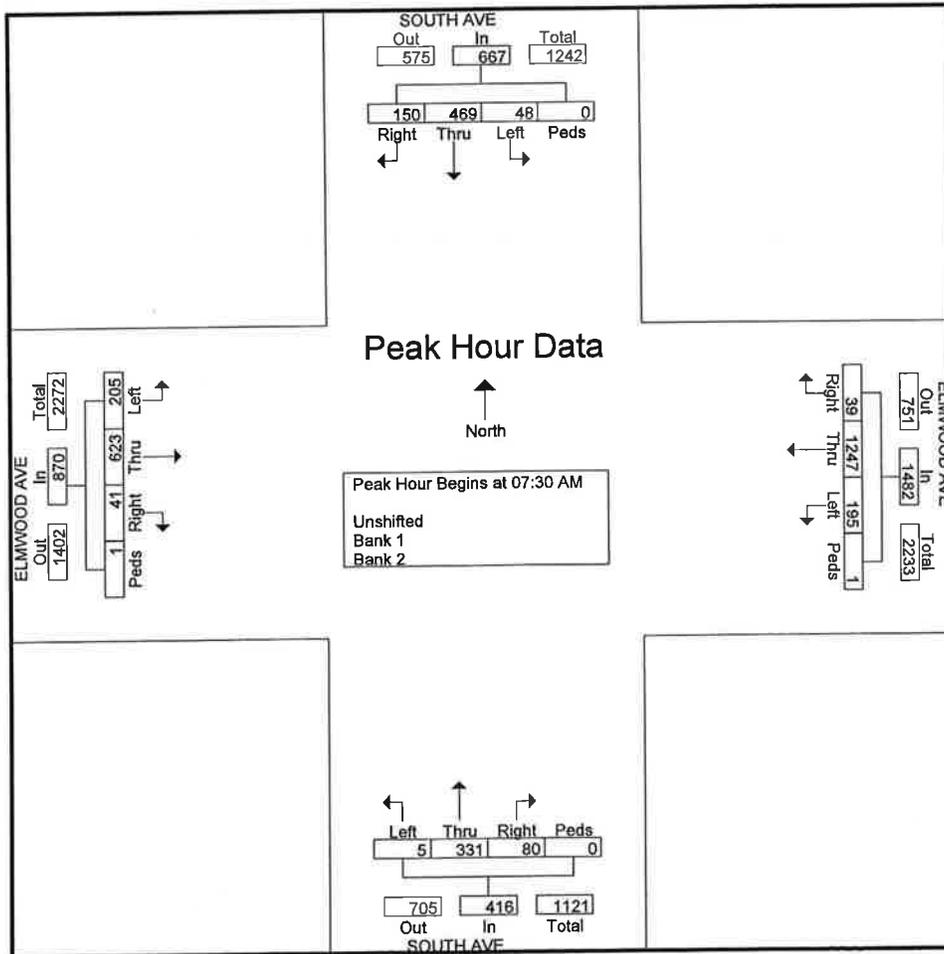
Start Time	SOUTH AVE Southbound					ELMWOOD AVE Westbound					SOUTH AVE Northbound					ELMWOOD AVE Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	27	51	6	0	84	7	149	19	1	176	13	49	1	0	63	4	85	24	0	113	436
07:15 AM	24	70	11	0	105	13	224	21	0	258	21	74	0	0	95	23	77	23	0	123	581
07:30 AM	41	108	12	0	161	12	303	37	0	352	18	64	1	0	83	7	126	30	0	163	759
07:45 AM	45	139	10	0	194	12	358	57	0	427	18	87	2	0	107	10	205	63	0	278	1006
Total	137	368	39	0	544	44	1034	134	1	1213	70	274	4	0	348	44	493	140	0	677	2782
08:00 AM	37	99	12	0	148	7	253	47	0	307	22	88	1	0	111	9	151	57	0	217	783
08:15 AM	27	123	14	0	164	8	333	54	1	396	22	92	1	0	115	15	141	55	1	212	887
08:30 AM	38	88	8	0	134	12	236	54	0	302	17	106	5	0	128	9	110	27	0	146	710
08:45 AM	41	112	10	0	163	7	227	58	0	292	14	101	6	0	121	10	119	34	0	163	739
Total	143	422	44	0	609	34	1049	213	1	1297	75	387	13	0	475	43	521	173	1	738	3119
Grand Total	280	790	83	0	1153	78	2083	347	2	2510	145	661	17	0	823	87	1014	313	1	1415	5901
Approch %	24.3	68.5	7.2	0		3.1	83	13.8	0.1		17.6	80.3	2.1	0		6.1	71.7	22.1	0.1		
Total %	4.7	13.4	1.4	0	19.5	1.3	35.3	5.9	0	42.5	2.5	11.2	0.3	0	13.9	1.5	17.2	5.3	0	24	
Unshifted	258	753	63	0	1074	71	2061	342	1	2475	137	611	13	0	761	82	977	292	1	1352	5662
% Unshifted	92.1	95.3	75.9	0	93.1	91	98.9	98.6	50	98.6	94.5	92.4	76.5	0	92.5	94.3	96.4	93.3	100	95.5	95.9
Bank 1	9	8	1	0	18	2	8	3	0	13	3	13	2	0	18	3	16	6	0	25	74
% Bank 1	3.2	1	1.2	0	1.6	2.6	0.4	0.9	0	0.5	2.1	2	11.8	0	2.2	3.4	1.6	1.9	0	1.8	1.3
Bank 2	13	29	19	0	61	5	14	2	1	22	5	37	2	0	44	2	21	15	0	38	165
% Bank 2	4.6	3.7	22.9	0	5.3	6.4	0.7	0.6	50	0.9	3.4	5.6	11.8	0	5.3	2.3	2.1	4.8	0	2.7	2.8

TRA ENGINEERING, PC

530 Summit Point Drive
Henrietta, NY 14467

File Name : Elm-South_AM_All Legs
Site Code : 00000000
Start Date : 11/17/2006
Page No : 2

Start Time	SOUTH AVE Southbound					ELMWOOD AVE Westbound					SOUTH AVE Northbound					ELMWOOD AVE Eastbound					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	In. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	41	108	12	0	161	12	303	37	0	352	18	64	1	0	83	7	126	30	0	163	759
07:45 AM	45	139	10	0	194	12	358	57	0	427	18	87	2	0	107	10	205	63	0	278	1006
08:00 AM	37	99	12	0	148	7	253	47	0	307	22	88	1	0	111	9	151	57	0	217	783
08:15 AM	27	123	14	0	164	8	333	54	1	396	22	92	1	0	115	15	141	55	1	212	887
Total Volume	150	469	48	0	667	39	1247	195	1	1482	80	331	5	0	416	41	623	205	1	870	3435
% App. Total	22.5	70.3	7.2	0		2.6	84.1	13.2	0.1		19.2	79.6	1.2	0		4.7	71.6	23.6	0.1		
PHF	.833	.844	.857	.000	.860	.813	.871	.855	.250	.868	.909	.899	.625	.000	.904	.683	.760	.813	.250	.782	.854



FRA ENGINEERING, PC

530 Summit Point Drive
Henrietta, NY 14467

File Name : Elm-South_PM
Site Code : 00000000
Start Date : 11/15/2006
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Groups Printed- Unshifted - Bank 1 - Bank 2

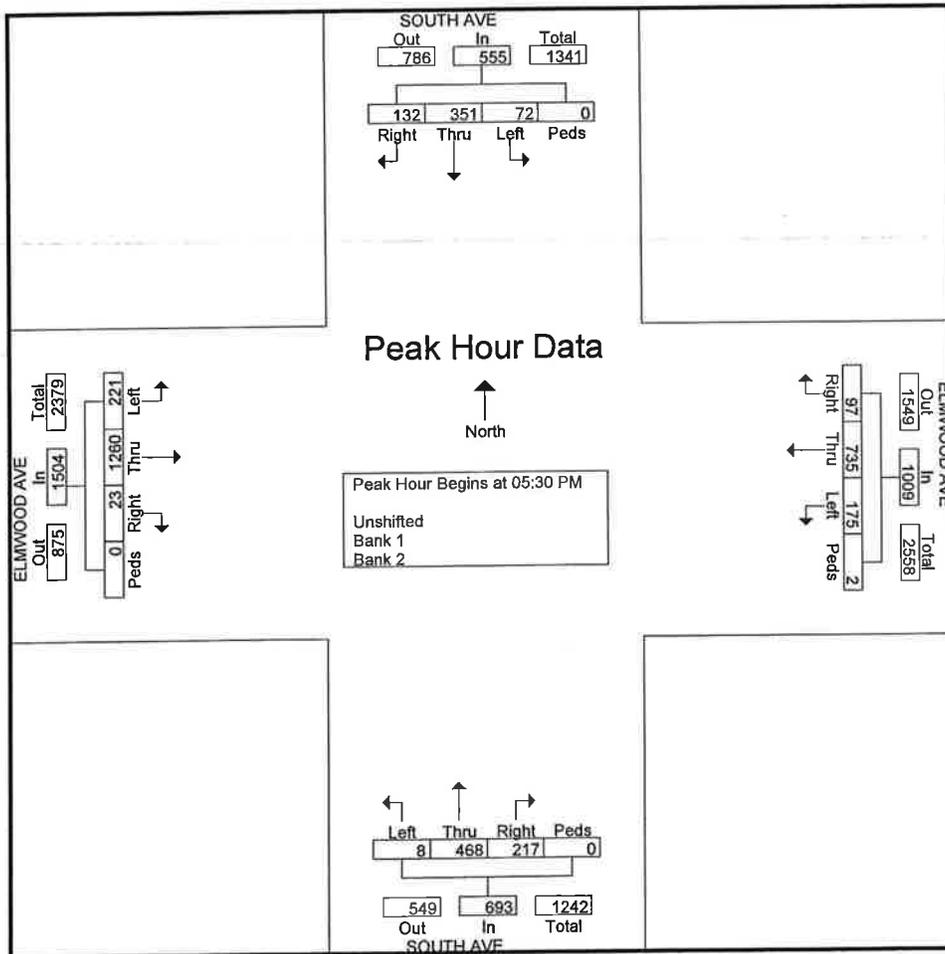
Start Time	SOUTH AVE Southbound					ELMWOOD AVE Westbound					SOUTH AVE Northbound					ELMWOOD AVE Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
05:00 PM	37	82	22	0	141	6	146	31	0	183	35	94	2	0	131	3	214	43	0	260	715
05:15 PM	26	88	18	0	132	12	187	49	0	248	50	97	2	0	149	3	229	27	0	259	788
05:30 PM	38	93	19	0	150	27	198	43	2	270	67	93	3	0	163	3	258	44	0	305	888
05:45 PM	31	86	17	0	134	23	181	54	0	258	42	103	2	0	147	1	296	45	0	342	881
Total	132	349	76	0	557	68	712	177	2	959	194	387	9	0	590	10	997	159	0	1166	3272
06:00 PM	30	87	21	0	138	24	163	39	0	226	46	114	2	0	162	10	343	46	0	399	925
06:15 PM	33	85	15	0	133	23	193	39	0	255	62	158	1	0	221	9	363	86	0	458	1067
06:30 PM	39	101	12	0	152	17	139	38	0	194	43	82	2	0	127	10	270	34	0	314	787
06:45 PM	25	66	20	0	111	15	121	39	0	175	34	95	0	1	130	11	190	29	0	230	646
Total	127	339	68	0	534	79	616	155	0	850	185	449	5	1	640	40	1166	195	0	1401	3425
Grand Total	259	688	144	0	1091	147	1328	332	2	1809	379	836	14	1	1230	50	2163	354	0	2567	6697
Apprch %	23.7	63.1	13.2	0		8.1	73.4	18.4	0.1		30.8	68	1.1	0.1		1.9	84.3	13.8	0		
Total %	3.9	10.3	2.2	0	16.3	2.2	19.8	5	0	27	5.7	12.5	0.2	0	18.4	0.7	32.3	5.3	0	38.3	
Unshifted	251	674	130	0	1055	137	1317	330	2	1786	375	819	13	1	1208	49	2151	353	0	2553	6602
% Unshifted	96.9	98	90.3	0	96.7	93.2	99.2	99.4	100	98.7	98.9	98	92.9	100	98.2	98	99.4	99.7	0	99.5	98.6
Bank 1	3	5	0	0	8	1	5	2	0	8	2	5	0	0	7	1	5	1	0	7	30
% Bank 1	1.2	0.7	0	0	0.7	0.7	0.4	0.6	0	0.4	0.5	0.6	0	0	0.6	2	0.2	0.3	0	0.3	0.4
Bank 2	5	9	14	0	28	9	6	0	0	15	2	12	1	0	15	0	7	0	0	7	65
% Bank 2	1.9	1.3	9.7	0	2.6	6.1	0.5	0	0	0.8	0.5	1.4	7.1	0	1.2	0	0.3	0	0	0.3	1

FRA ENGINEERING, PC

530 Summit Point Drive
Henrietta, NY 14467

File Name : Elm-South_PM
Site Code : 00000000
Start Date : 11/15/2006
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Start Time	SOUTH AVE Southbound					ELMWOOD AVE Westbound					SOUTH AVE Northbound					ELMWOOD AVE Eastbound					In Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 05:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:30 PM																					
05:30 PM	38	93	19	0	150	27	198	43	2	270	67	93	3	0	163	3	258	44	0	305	888
05:45 PM	31	86	17	0	134	23	181	54	0	258	42	103	2	0	147	1	296	45	0	342	881
06:00 PM	30	87	21	0	138	24	163	39	0	226	46	114	2	0	162	10	343	46	0	399	925
06:15 PM	33	85	15	0	133	23	193	39	0	255	62	158	1	0	221	9	363	86	0	458	1067
Total Volume	132	351	72	0	555	97	735	175	2	1009	217	468	8	0	693	23	1260	221	0	1504	3761
% App. Total	23.8	63.2	13	0		9.6	72.8	17.3	0.2		31.3	67.5	1.2	0		1.5	83.8	14.7	0		
PHF	.868	.944	.857	.000	.925	.898	.928	.810	.250	.934	.810	.741	.667	.000	.784	.575	.868	.642	.000	.821	.881





530 Summit Point Drive
Henrietta, NY 14467

File Name : Kendrick-East River_AM
Site Code : 00000000
Start Date : 11/16/2006
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Groups Printed- Cars - Trucks - Bus

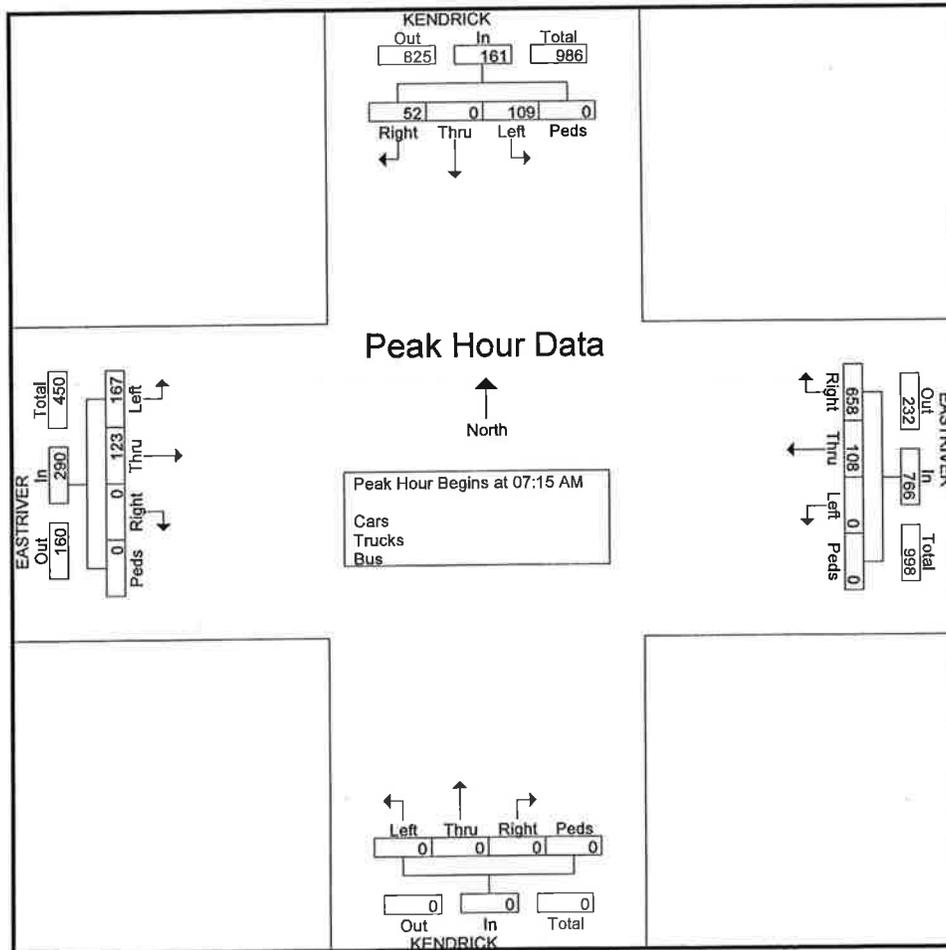
Start Time	KENDRICK Southbound					EASTRIVER Westbound					KENDRICK Northbound					EASTRIVER Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	5	0	10	0	15	81	11	0	0	92	0	0	0	0	0	0	18	23	0	41	148
07:15 AM	14	0	21	0	35	140	23	0	0	163	0	0	0	0	0	0	23	42	0	65	263
07:30 AM	9	0	33	0	42	180	32	0	0	212	0	0	0	0	0	0	26	43	0	69	323
07:45 AM	14	0	28	0	42	198	25	0	0	223	0	0	0	0	0	0	42	41	0	83	348
Total	42	0	92	0	134	599	91	0	0	690	0	0	0	0	0	0	109	149	0	258	1082
08:00 AM	15	0	27	0	42	140	28	0	0	168	0	0	0	0	0	0	32	41	0	73	283
08:15 AM	10	0	19	0	29	105	22	0	0	127	0	0	0	0	0	0	32	27	0	59	215
08:30 AM	18	0	24	0	42	123	27	0	0	150	0	0	0	0	0	0	25	33	0	58	250
08:45 AM	11	0	34	0	45	123	31	0	0	154	0	0	0	0	0	0	15	18	0	33	232
Total	54	0	104	0	158	491	108	0	0	599	0	0	0	0	0	0	104	119	0	223	980
Grand Total	96	0	196	0	292	1090	199	0	0	1289	0	0	0	0	0	0	213	268	0	481	2062
Apprch %	32.9	0	67.1	0		84.6	15.4	0	0		0	0	0	0	0	0	44.3	55.7	0		
Total %	4.7	0	9.5	0	14.2	52.9	9.7	0	0	62.5	0	0	0	0	0	0	10.3	13	0	23.3	
Cars	96	0	181	0	277	1076	196	0	0	1272	0	0	0	0	0	0	210	268	0	478	2027
% Cars	100	0	92.3	0	94.9	98.7	98.5	0	0	98.7	0	0	0	0	0	0	98.6	100	0	99.4	98.3
Trucks	0	0	6	0	6	5	3	0	0	8	0	0	0	0	0	0	1	0	0	1	15
% Trucks	0	0	3.1	0	2.1	0.5	1.5	0	0	0.6	0	0	0	0	0	0	0.5	0	0	0.2	0.7
Bus	0	0	9	0	9	9	0	0	0	9	0	0	0	0	0	0	2	0	0	2	20
% Bus	0	0	4.6	0	3.1	0.8	0	0	0	0.7	0	0	0	0	0	0	0.9	0	0	0.4	1



530 Summit Point Drive
Henrietta, NY 14467

File Name : Kendrick-East River_AM
Site Code : 00000000
Start Date : 11/16/2006
Page No : 2

Start Time	KENDRICK Southbound					EASTRIVER Westbound					KENDRICK Northbound					EASTRIVER Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	14	0	21	0	35	140	23	0	0	163	0	0	0	0	0	0	23	42	0	65	263
07:30 AM	9	0	33	0	42	180	32	0	0	212	0	0	0	0	0	0	26	43	0	69	323
07:45 AM	14	0	28	0	42	198	25	0	0	223	0	0	0	0	0	0	42	41	0	83	348
08:00 AM	15	0	27	0	42	140	28	0	0	168	0	0	0	0	0	0	32	41	0	73	283
Total Volume	52	0	109	0	161	658	108	0	0	766	0	0	0	0	0	0	123	167	0	290	1217
% App. Total	32.3	0	67.7	0		85.9	14.1	0	0		0	0	0	0		0	42.4	57.6	0		
PHF	.867	.000	.826	.000	.958	.831	.844	.000	.000	.859	.000	.000	.000	.000	.000	.000	.732	.971	.000	.873	.874





530 Summit Point Drive
Henrietta, NY 14467

File Name : Kendrick and East River Road 11-14-06 PM
Site Code : 00000000
Start Date : 11/14/2006
Page No : 1

Groups Printed- Car - Truck - Bus

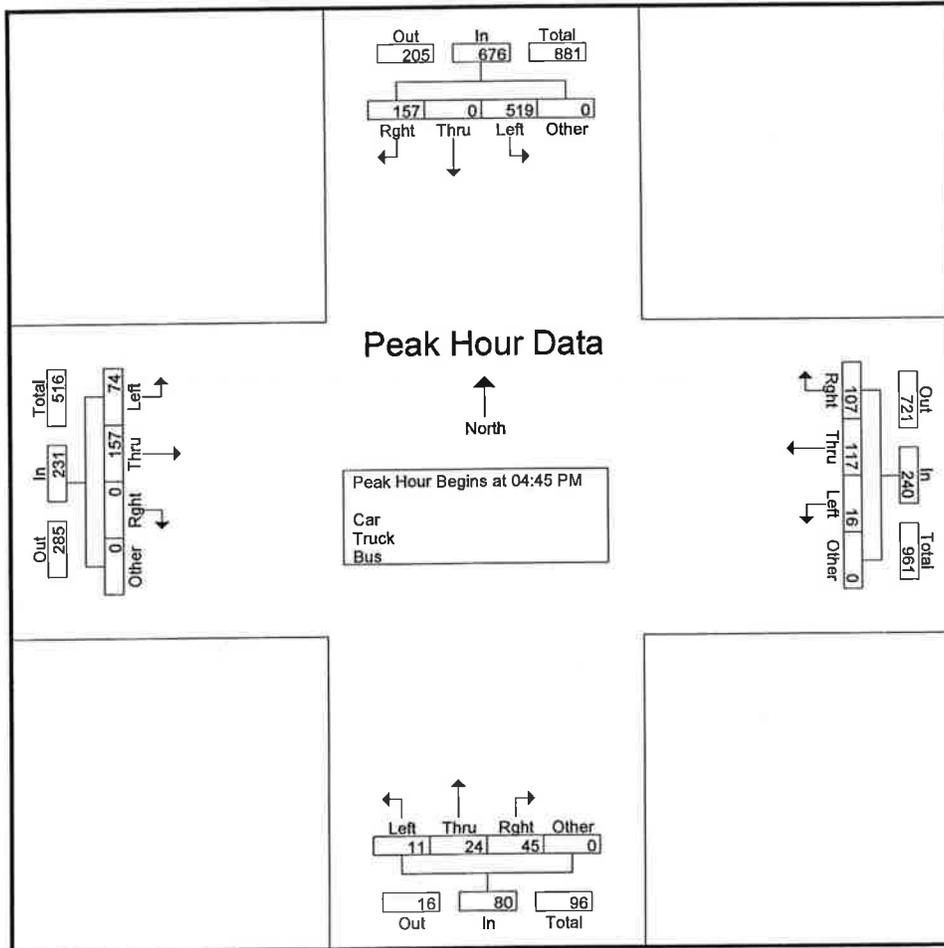
Start Time	Southbound					Westbound					Northbound					Eastbound					Int. Total
	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	
04:00 PM	20	0	74	0	94	24	19	0	0	43	7	5	7	0	19	0	26	22	0	48	204
04:15 PM	32	0	82	0	114	29	26	3	0	58	5	4	1	0	10	1	32	8	0	41	223
04:30 PM	44	0	129	0	173	27	24	4	0	55	8	10	3	0	21	0	21	19	0	40	289
04:45 PM	39	0	128	0	167	29	32	1	0	62	15	5	1	0	21	0	24	19	0	43	293
Total	135	0	413	0	548	109	101	8	0	218	35	24	12	0	71	1	103	68	0	172	1009
05:00 PM	44	0	148	0	192	24	23	2	0	49	9	7	4	0	20	0	47	17	0	64	325
05:15 PM	44	0	132	0	176	23	19	11	0	53	9	6	1	0	16	0	37	25	0	62	307
05:30 PM	30	0	111	0	141	31	43	2	0	76	12	6	5	0	23	0	49	13	0	62	302
05:45 PM	21	0	91	0	112	26	18	6	0	50	18	8	2	0	28	0	46	10	0	56	246
Total	139	0	482	0	621	104	103	21	0	228	48	27	12	0	87	0	179	65	0	244	1180
Grand Total	274	0	895	0	1169	213	204	29	0	446	83	51	24	0	158	1	282	133	0	416	2189
Apprch %	23.4	0	76.6	0		47.8	45.7	6.5	0		52.5	32.3	15.2	0		0.2	67.8	32	0		
Total %	12.5	0	40.9	0	53.4	9.7	9.3	1.3	0	20.4	3.8	2.3	1.1	0	7.2	0	12.9	6.1	0	19	
Car	273	0	886	0	1159	212	201	29	0	442	78	47	24	0	149	1	276	133	0	410	2160
% Car	99.6	0	99	0	99.1	99.5	98.5	100	0	99.1	94	92.2	100	0	94.3	100	97.9	100	0	98.6	98.7
Truck	1	0	2	0	3	0	1	0	0	1	3	0	0	0	3	0	0	0	0	0	7
% Truck	0.4	0	0.2	0	0.3	0	0.5	0	0	0.2	3.6	0	0	0	1.9	0	0	0	0	0	0.3
Bus	0	0	7	0	7	1	2	0	0	3	2	4	0	0	6	0	6	0	0	6	22
% Bus	0	0	0.8	0	0.6	0.5	1	0	0	0.7	2.4	7.8	0	0	3.8	0	2.1	0	0	1.4	1



530 Summit Point Drive
Henrietta, NY 14467

File Name : Kendrick and East River Road 11-14-06 PM
Site Code : 00000000
Start Date : 11/14/2006
Page No : 2

Start Time	Southbound					Westbound					Northbound					Eastbound					Int. Total
	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	39	0	128	0	167	29	32	1	0	62	15	5	1	0	21	0	24	19	0	43	293
05:00 PM	44	0	148	0	192	24	23	2	0	49	9	7	4	0	20	0	47	17	0	64	325
05:15 PM	44	0	132	0	176	23	19	11	0	53	9	6	1	0	16	0	37	25	0	62	307
05:30 PM	30	0	111	0	141	31	43	2	0	76	12	6	5	0	23	0	49	13	0	62	302
Total Volume	157	0	519	0	676	107	117	16	0	240	45	24	11	0	80	0	157	74	0	231	1227
% App. Total	23.2	0	76.8	0		44.6	48.8	6.7	0		56.2	30	13.8	0		0	68	32	0		
PHF	.892	.000	.877	.000	.880	.863	.680	.364	.000	.789	.750	.857	.550	.000	.870	.000	.801	.740	.000	.902	.944





530 Summit Point Drive
Henrietta, NY 14467

File Name : Kendrick and Lattimore 11-14-06 AM
Site Code : 00000000
Start Date : 11/14/2006
Page No : 1

Groups Printed- Auto - Bus - Truck

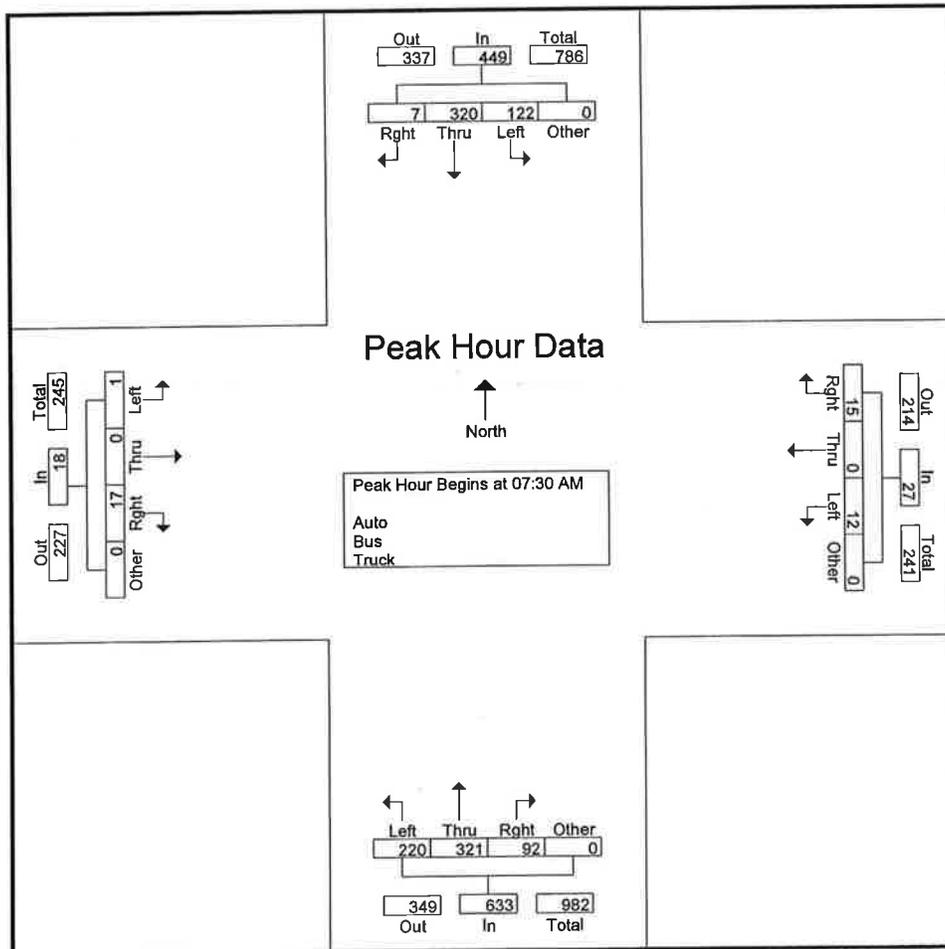
Start Time	Southbound					Westbound					Northbound					Eastbound					Int. Total
	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	
07:00 AM	0	41	30	0	71	8	0	2	0	10	26	96	33	0	155	1	0	0	0	1	237
07:15 AM	0	38	17	0	55	2	0	1	0	3	9	61	39	0	109	0	0	1	0	1	168
07:30 AM	0	78	31	0	109	0	0	3	0	3	24	79	75	0	178	6	0	0	0	6	296
07:45 AM	1	109	35	0	145	1	0	2	0	3	22	88	66	0	176	2	0	0	0	2	326
Total	1	266	113	0	380	11	0	8	0	19	81	324	213	0	618	9	0	1	0	10	1027
08:00 AM	2	79	28	0	109	7	0	4	0	11	28	72	46	0	146	6	0	1	0	7	273
08:15 AM	4	54	28	0	86	7	0	3	0	10	18	82	33	0	133	3	0	0	0	3	232
08:30 AM	6	60	16	0	82	7	0	6	0	13	29	85	63	0	177	9	0	0	0	9	281
08:45 AM	4	67	19	0	90	7	0	5	0	12	14	59	48	0	121	5	0	0	0	5	228
Total	16	260	91	0	367	28	0	18	0	46	89	298	190	0	577	23	0	1	0	24	1014
Grand Total	17	526	204	0	747	39	0	26	0	65	170	622	403	0	1195	32	0	2	0	34	2041
Apprch %	2.3	70.4	27.3	0		60	0	40	0		14.2	52.1	33.7	0		94.1	0	5.9	0		
Total %	0.8	25.8	10	0	36.6	1.9	0	1.3	0	3.2	8.3	30.5	19.7	0	58.5	1.6	0	0.1	0	1.7	
Auto	17	510	194	0	721	39	0	26	0	65	169	604	403	0	1176	32	0	2	0	34	1996
% Auto	100	97	95.1	0	96.5	100	0	100	0	100	99.4	97.1	100	0	98.4	100	0	100	0	100	97.8
Bus	0	13	9	0	22	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	36
% Bus	0	2.5	4.4	0	2.9	0	0	0	0	0	0	2.3	0	0	1.2	0	0	0	0	0	1.8
Truck	0	3	1	0	4	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	9
% Truck	0	0.6	0.5	0	0.5	0	0	0	0	0	0.6	0.6	0	0	0.4	0	0	0	0	0	0.4



530 Summit Point Drive
Henrietta, NY 14467

File Name : Kendrick and Lattimore 11-14-06 AM
Site Code : 00000000
Start Date : 11/14/2006
Page No : 2

Start Time	Southbound					Westbound					Northbound					Eastbound					Int. Total
	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	78	31	0	109	0	0	3	0	3	24	79	75	0	178	6	0	0	0	6	296
07:45 AM	1	109	35	0	145	1	0	2	0	3	22	88	66	0	176	2	0	0	0	2	326
08:00 AM	2	79	28	0	109	7	0	4	0	11	28	72	46	0	146	6	0	1	0	7	273
08:15 AM	4	54	28	0	86	7	0	3	0	10	18	82	33	0	133	3	0	0	0	3	232
Total Volume	7	320	122	0	449	15	0	12	0	27	92	321	220	0	633	17	0	1	0	18	1127
% App. Total	1.6	71.3	27.2	0		55.6	0	44.4	0		14.5	50.7	34.8	0		94.4	0	5.6	0		
PHF	.438	.734	.871	.000	.774	.536	.000	.750	.000	.614	.821	.912	.733	.000	.889	.708	.000	.250	.000	.643	.864





530 Summit Point Drive
Henrietta, NY 14467

File Name : Kendrick and Lattimore_PM
Site Code : 00000000
Start Date : 11/14/2006
Page No : 1

Groups Printed- Auto - Bus - Truck

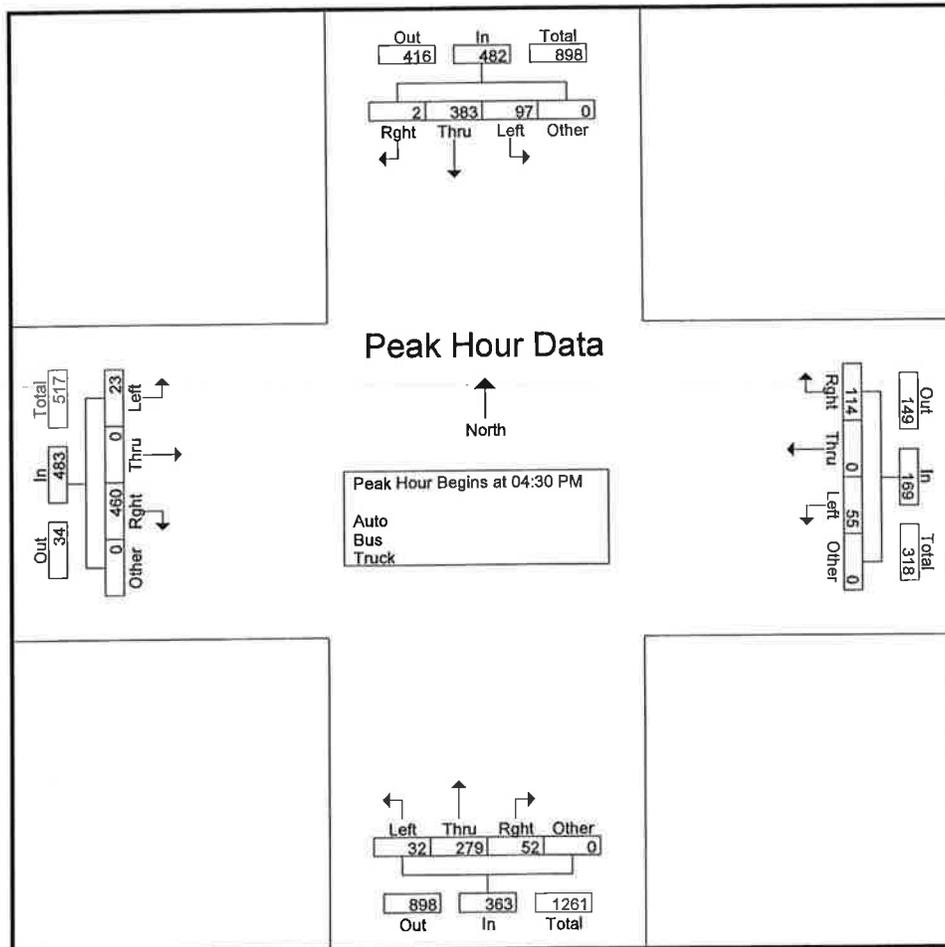
Start Time	Southbound					Westbound					Northbound					Eastbound					Int. Total	
	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total		
04:00 PM	1	77	22	0	100	32	0	6	0	38	8	62	4	0	74	47	0	0	0	47	259	
04:15 PM	1	77	15	0	93	21	0	9	0	30	5	65	3	0	73	59	0	0	0	59	255	
04:30 PM	2	112	23	0	137	22	0	10	0	32	14	68	13	0	95	80	0	8	0	88	352	
04:45 PM	0	104	23	0	127	43	0	10	0	53	14	76	9	0	99	135	0	3	0	138	417	
Total	4	370	83	0	457	118	0	35	0	153	41	271	29	0	341	321	0	11	0	332	1283	
05:00 PM	0	98	29	0	127	30	0	23	0	53	14	71	6	0	91	120	0	5	0	125	396	
05:15 PM	0	69	22	0	91	19	0	12	0	31	10	64	4	0	78	125	0	7	0	132	332	
05:30 PM	2	71	21	0	94	20	0	6	0	26	10	63	11	0	84	110	0	4	0	114	318	
05:45 PM	2	52	15	0	69	14	0	16	0	30	9	64	7	0	80	64	0	2	0	66	245	
Total	4	290	87	0	381	83	0	57	0	140	43	262	28	0	333	419	0	18	0	437	1291	
Grand Total	8	660	170	0	838	201	0	92	0	293	84	533	57	0	674	740	0	29	0	769	2574	
Apprch %	1	78.8	20.3	0		68.6	0	31.4	0		12.5	79.1	8.5	0		96.2	0	3.8	0			
Total %	0.3	25.6	6.6	0	32.6	7.8	0	3.6	0	11.4	3.3	20.7	2.2	0	26.2	28.7	0	1.1	0	29.9		
Auto	8	653	169	0	830	201	0	92	0	293	84	522	57	0	663	740	0	29	0	769	2555	
% Auto	100	98.9	99.4	0	99	100	0	100	0	100	100	97.9	100	0	98.4	100	0	100	0	100	99.3	
Bus	0	6	1	0	7	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	17
% Bus	0	0.9	0.6	0	0.8	0	0	0	0	0	0	1.9	0	0	1.5	0	0	0	0	0	0	0.7
Truck	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2
% Truck	0	0.2	0	0	0.1	0	0	0	0	0	0	0.2	0	0	0.1	0	0	0	0	0	0	0.1



530 Summit Point Drive
Henrietta, NY 14467

File Name : Kendrick and Lattimore_PM
Site Code : 00000000
Start Date : 11/14/2006
Page No : 2

Start Time	Southbound					Westbound					Northbound					Eastbound					Int. Total
	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	Rght	Thru	Left	Other	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	2	112	23	0	137	22	0	10	0	32	14	68	13	0	95	80	0	8	0	88	352
04:45 PM	0	104	23	0	127	43	0	10	0	53	14	76	9	0	99	135	0	3	0	138	417
05:00 PM	0	98	29	0	127	30	0	23	0	53	14	71	6	0	91	120	0	5	0	125	396
05:15 PM	0	69	22	0	91	19	0	12	0	31	10	64	4	0	78	125	0	7	0	132	332
Total Volume	2	383	97	0	482	114	0	55	0	169	52	279	32	0	363	460	0	23	0	483	1497
% App. Total	0.4	79.5	20.1	0		67.5	0	32.5	0		14.3	76.9	8.8	0		95.2	0	4.8	0		
PHF	.250	.855	.836	.000	.880	.663	.000	.598	.000	.797	.929	.918	.615	.000	.917	.852	.000	.719	.000	.875	.897





530 Summit Point Drive
Henrietta, NY 14467

File Name : Kendrick and Westmoreland 11-14-06 AM
Site Code : 00000000
Start Date : 11/14/2006
Page No : 1

Groups Printed- Car - Truck - Bus

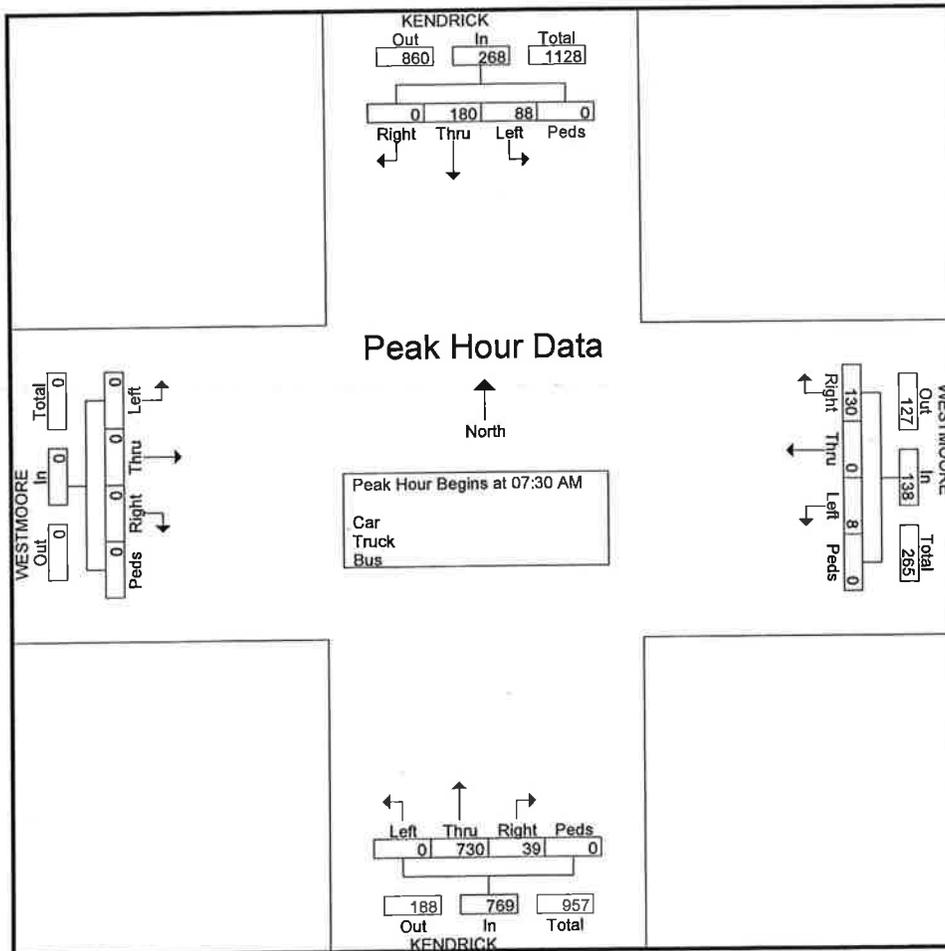
Start Time	KENDRICK Southbound					WESTMOORE Westbound					KENDRICK Northbound					WESTMOORE Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	18	5	0	23	26	0	2	0	28	12	119	0	0	131	0	0	0	0	0	182
07:15 AM	0	28	16	0	44	25	0	0	0	25	6	165	0	0	171	0	0	0	0	0	240
07:30 AM	0	51	24	0	75	40	0	3	0	43	8	220	0	0	228	0	0	0	0	0	346
07:45 AM	0	58	28	0	86	40	0	1	0	41	14	209	0	0	223	0	0	0	0	0	350
Total	0	155	73	0	228	131	0	6	0	137	40	713	0	0	753	0	0	0	0	0	1118
08:00 AM	0	41	23	0	64	20	0	0	0	20	7	144	0	0	151	0	0	0	0	0	235
08:15 AM	0	30	13	0	43	30	0	4	0	34	10	157	0	0	167	0	0	0	0	0	244
08:30 AM	0	42	15	0	57	30	0	2	0	32	7	140	0	0	147	0	0	0	0	0	236
08:45 AM	0	45	12	0	57	31	0	3	0	34	9	141	0	0	150	0	0	0	0	0	241
Total	0	158	63	0	221	111	0	9	0	120	33	582	0	0	615	0	0	0	0	0	956
Grand Total	0	313	136	0	449	242	0	15	0	257	73	1295	0	0	1368	0	0	0	0	0	2074
Apprch %	0	69.7	30.3	0		94.2	0	5.8	0		5.3	94.7	0	0		0	0	0	0		
Total %	0	15.1	6.6	0	21.6	11.7	0	0.7	0	12.4	3.5	62.4	0	0	66	0	0	0	0	0	
Car	0	300	135	0	435	239	0	14	0	253	73	1284	0	0	1357	0	0	0	0	0	2045
% Car	0	95.8	99.3	0	96.9	98.8	0	93.3	0	98.4	100	99.2	0	0	99.2	0	0	0	0	0	98.6
Truck	0	2	0	0	2	1	0	1	0	2	0	2	0	0	2	0	0	0	0	0	6
% Truck	0	0.6	0	0	0.4	0.4	0	6.7	0	0.8	0	0.2	0	0	0.1	0	0	0	0	0	0.3
Bus	0	11	1	0	12	2	0	0	0	2	0	9	0	0	9	0	0	0	0	0	23
% Bus	0	3.5	0.7	0	2.7	0.8	0	0	0	0.8	0	0.7	0	0	0.7	0	0	0	0	0	1.1



530 Summit Point Drive
Henrietta, NY 14467

File Name : Kendrick and Westmoreland 11-14-06 AM
Site Code : 00000000
Start Date : 11/14/2006
Page No : 2

Start Time	KENDRICK Southbound					WESTMOORE Westbound					KENDRICK Northbound					WESTMOORE Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	51	24	0	75	40	0	3	0	43	8	220	0	0	228	0	0	0	0	0	346
07:45 AM	0	58	28	0	86	40	0	1	0	41	14	209	0	0	223	0	0	0	0	0	350
08:00 AM	0	41	23	0	64	20	0	0	0	20	7	144	0	0	151	0	0	0	0	0	235
08:15 AM	0	30	13	0	43	30	0	4	0	34	10	157	0	0	167	0	0	0	0	0	244
Total Volume	0	180	88	0	268	130	0	8	0	138	39	730	0	0	769	0	0	0	0	0	1175
% App. Total	0	67.2	32.8	0		94.2	0	5.8	0		5.1	94.9	0	0		0	0	0	0	0	
PHF	.000	.776	.786	.000	.779	.813	.000	.500	.000	.802	.696	.830	.000	.000	.843	.000	.000	.000	.000	.000	.839





530 Summit Point Drive
Henrietta, NY 14467

File Name : Westmoerland and Kendrick 11-15-06 PM
Site Code : 00000000
Start Date : 11/15/2006
Page No : 1

Groups Printed- Cars - Trucks - Bus

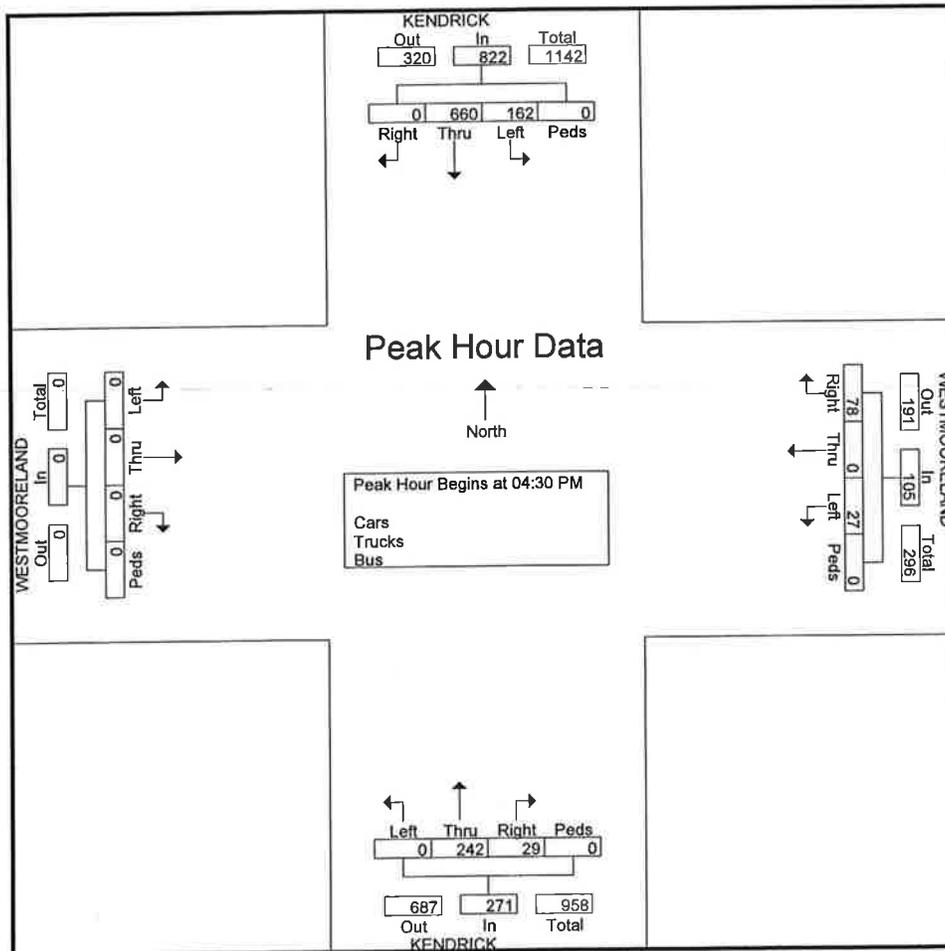
Start Time	KENDRICK Southbound					WESTMOORELAND Westbound					KENDRICK Northbound					WESTMOORELAND Eastbound					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
04:00 PM	0	101	37	0	138	22	0	8	0	30	6	40	0	0	46	0	0	0	0	0	0	214
04:15 PM	0	105	30	0	135	17	0	6	0	23	6	47	0	0	53	0	0	0	0	0	0	211
04:30 PM	0	199	47	0	246	17	0	6	0	23	9	59	0	0	68	0	0	0	0	0	0	337
04:45 PM	0	145	47	0	192	20	0	5	0	25	7	70	0	0	77	0	0	0	0	0	0	294
Total	0	550	161	0	711	76	0	25	0	101	28	216	0	0	244	0	0	0	0	0	0	1056
05:00 PM	0	171	39	0	210	23	0	7	0	30	7	64	0	0	71	0	0	0	0	0	0	311
05:15 PM	0	145	29	0	174	18	0	9	0	27	6	49	0	0	55	0	0	0	0	0	0	256
05:30 PM	0	100	37	0	137	19	0	6	0	25	9	41	0	0	50	0	0	0	0	0	0	212
05:45 PM	0	104	25	0	129	9	0	1	0	10	6	65	0	0	71	0	0	0	0	0	0	210
Total	0	520	130	0	650	69	0	23	0	92	28	219	0	0	247	0	0	0	0	0	0	989
Grand Total	0	1070	291	0	1361	145	0	48	0	193	56	435	0	0	491	0	0	0	0	0	0	2045
Apprch %	0	78.6	21.4	0		75.1	0	24.9	0		11.4	88.6	0	0		0	0	0	0	0	0	
Total %	0	52.3	14.2	0	66.6	7.1	0	2.3	0	9.4	2.7	21.3	0	0	24	0	0	0	0	0	0	
Cars	0	1063	291	0	1354	143	0	48	0	191	56	430	0	0	486	0	0	0	0	0	0	2031
% Cars	0	99.3	100	0	99.5	98.6	0	100	0	99	100	98.9	0	0	99	0	0	0	0	0	0	99.3
Trucks	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Trucks	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bus	0	6	0	0	6	2	0	0	0	2	0	5	0	0	5	0	0	0	0	0	0	13
% Bus	0	0.6	0	0	0.4	1.4	0	0	0	1	0	1.1	0	0	1	0	0	0	0	0	0	0.6

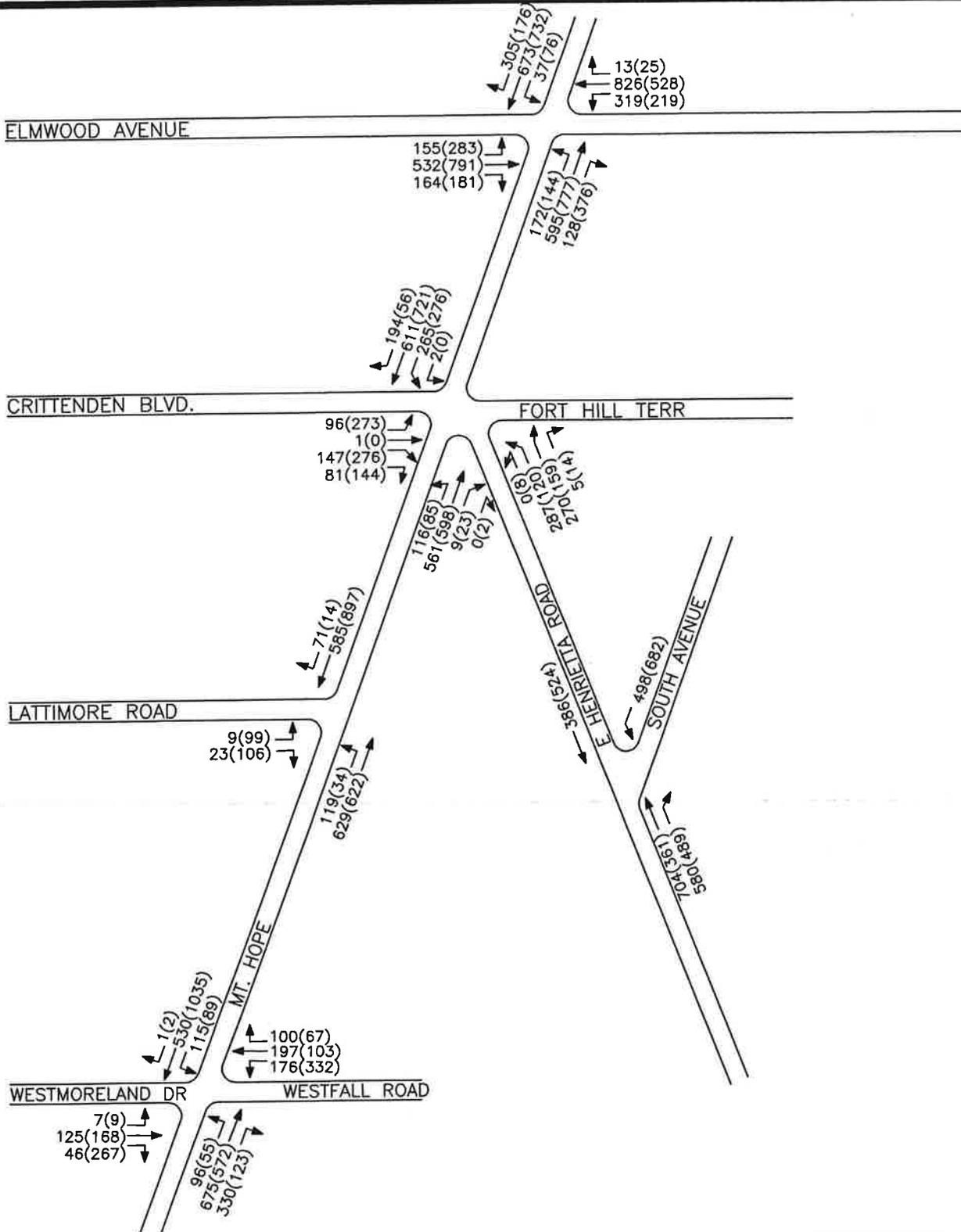


530 Summit Point Drive
Henrietta, NY 14467

File Name : Westmoerland and Kendrick 11-15-06 PM
Site Code : 00000000
Start Date : 11/15/2006
Page No : 2

Start Time	KENDRICK Southbound					WESTMOORELAND Westbound					KENDRICK Northbound					WESTMOORELAND Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	199	47	0	246	17	0	6	0	23	9	59	0	0	68	0	0	0	0	0	337
04:45 PM	0	145	47	0	192	20	0	5	0	25	7	70	0	0	77	0	0	0	0	0	294
05:00 PM	0	171	39	0	210	23	0	7	0	30	7	64	0	0	71	0	0	0	0	0	311
05:15 PM	0	145	29	0	174	18	0	9	0	27	6	49	0	0	55	0	0	0	0	0	256
Total Volume	0	660	162	0	822	78	0	27	0	105	29	242	0	0	271	0	0	0	0	0	1198
% App. Total	0	80.3	19.7	0		74.3	0	25.7	0		10.7	89.3	0	0		0	0	0	0		
PHF	.000	.829	.862	.000	.835	.848	.000	.750	.000	.875	.806	.864	.000	.000	.880	.000	.000	.000	.000	.000	.889





REVISED 9/13/06



N

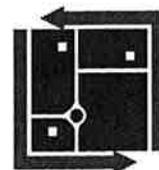
KEY

00(00) = AM(PM)

FIGURE X

PEAK HOUR VOLUMES
EXISTING CONDITIONS

MT. HOPE / E. HENRIETTA STUDY
CITY OF ROCHESTER, NEW YORK



SRF
ASSOCIATES

WWW.SRFA.NET

Traffic Engineering & Planning Consultants

D.A.S. ALL 6 SETS OF "MANUAL COUNTS" (Rtd. 9-19-06)

N.Y.S. Department of Transportation
1530 Jefferson Rd Rochester, N.Y.

Weather : Clear
Counted by : B. Bennett & B. Mase
Board # : T-481 & T-1051
Location : Rt390I&Rt15A NB OFF/ON RAMP

Data Services (585) 272-3424
or (585) 272-3410

File Name : RT390I&15A NB
Site Code : 00430092
Start Date : 3/17/2005
Page No : 1

Groups Printed - All Vehicles

Start Time	RT 15 A SB Southbound					RT 390 I NB OFF RAMP Westbound					RT 15A NB Northbound					RT 390 I NB ON RAMP Eastbound					Int. Total
	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:00 AM	20	98	0	0	118	155	112	68	1	336	0	165	23	0	188	0	0	0	1	1	643
07:15 AM	26	142	0	0	168	215	120	125	1	461	0	221	33	0	254	0	0	0	0	0	883
07:30 AM	34	200	0	0	234	191	178	199	0	568	0	234	37	0	271	0	0	0	0	0	1073
07:45 AM	28	230	0	0	258	184	158	180	1	523	0	261	45	0	306	0	0	0	0	0	1087
Total	108	670	0	0	778	745	568	572	3	1888	0	881	138	0	1019	0	0	0	1	1	3686
08:00 AM	28	173	0	0	201	154	144	144	1	443	0	188	47	0	235	0	0	0	0	0	879
08:15 AM	13	148	0	0	161	141	156	137	0	434	0	200	37	0	237	0	0	0	0	0	832
08:30 AM	19	151	0	0	170	149	145	173	0	467	0	162	30	0	192	0	0	0	0	0	829
08:45 AM	30	187	0	0	217	122	126	140	0	388	0	186	48	0	234	0	0	0	0	0	839
Total	90	659	0	0	749	566	571	594	1	1732	0	736	162	0	898	0	0	0	0	0	3379
12:00 PM	45	240	0	0	285	21	50	81	0	152	0	186	96	0	282	0	0	0	0	0	719
12:15 PM	41	247	0	0	288	21	56	107	1	185	0	204	115	0	319	0	0	0	1	1	793
12:30 PM	44	206	0	0	250	44	56	95	0	195	0	228	124	0	352	0	0	0	0	0	797
12:45 PM	57	195	0	0	252	53	71	73	0	197	0	202	102	0	304	0	0	0	0	0	753
Total	187	888	0	0	1075	139	233	356	1	729	0	820	437	0	1257	0	0	0	1	1	3062
02:00 PM	35	194	0	0	229	49	48	71	1	169	0	198	135	0	333	0	0	0	0	0	731
02:15 PM	58	206	0	1	265	43	46	63	0	152	0	218	122	0	340	0	0	0	0	0	757
02:30 PM	60	211	0	0	271	43	43	62	1	149	0	191	128	0	319	0	0	0	0	0	739
02:45 PM	62	232	0	0	294	47	51	82	0	180	0	195	95	0	290	0	0	0	0	0	764
Total	215	843	0	1	1059	182	188	278	2	650	0	802	480	0	1282	0	0	0	0	0	2991
03:00 PM	127	228	0	0	355	28	42	59	0	129	0	200	124	0	324	0	0	0	0	0	808
03:15 PM	74	269	0	0	343	35	42	74	1	152	0	203	121	0	324	0	0	0	0	0	819
03:30 PM	111	231	0	0	342	34	73	49	0	156	0	186	92	0	278	0	0	0	0	0	776
03:45 PM	106	327	0	0	433	43	61	74	3	181	0	197	102	0	299	0	0	0	0	0	913
Total	418	1055	0	0	1473	140	218	256	4	618	0	786	439	0	1225	0	0	0	0	0	3316
04:00 PM	109	222	0	0	331	31	62	61	0	154	0	159	121	0	280	0	0	0	0	0	765
04:15 PM	98	255	0	0	353	16	41	53	0	110	0	180	102	0	282	0	0	0	2	2	747
04:30 PM	137	276	0	0	413	24	59	62	1	146	0	149	75	0	224	0	0	0	1	1	784
04:45 PM	92	313	0	0	405	41	51	84	0	176	0	183	89	0	272	0	0	0	0	0	853
Total	436	1066	0	0	1502	112	213	260	1	586	0	671	387	0	1058	0	0	0	3	3	3149
05:00 PM	100	292	0	0	392	30	53	79	0	162	0	155	96	0	251	0	0	0	0	0	805
05:15 PM	95	303	0	0	398	32	60	64	1	157	0	185	104	0	289	0	0	0	1	1	845
Grand Total	164	577	0	1	7426	194	210	245	13	6522	0	503	224	0	7279	0	0	0	6	6	2123
Total	9	6				6	4	9				6	3								3
Apprch %	22.2	77.8	0.0	0.0		29.8	32.3	37.7	0.2		0.0	69.2	30.8	0.0		0.0	0.0	0.0	100.0		
Total %	7.8	27.2	0.0	0.0	35.0	9.2	9.9	11.6	0.1	30.7	0.0	23.7	10.6	0.0	34.3	0.0	0.0	0.0	0.0	0.0	0.0

430 30

424 1184

127 223 289

672 364

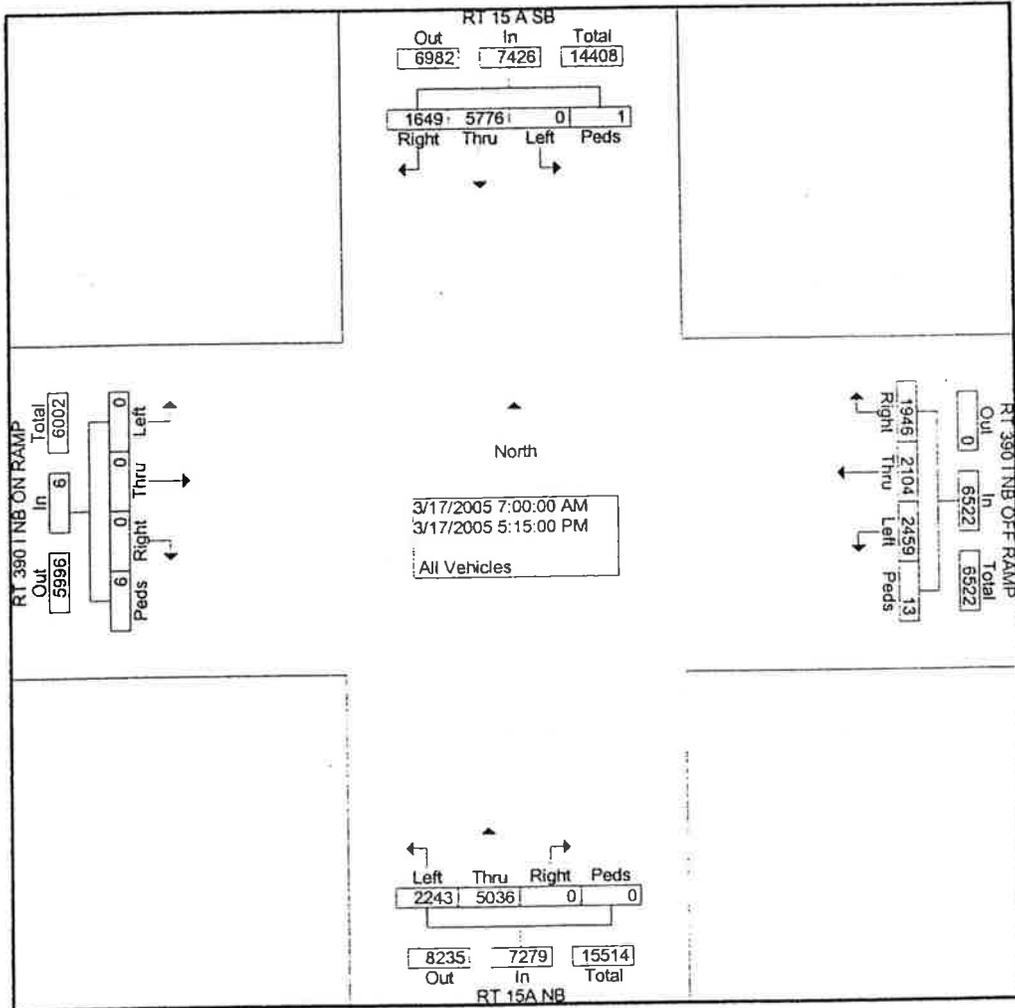
3283 P

N.Y.S. Department of Transportation
 1530 Jefferson Rd Rochester, N.Y.

Weather : Clear
 Counted by :B. Bennett & B. Mase
 Board # :T-481 & T-1051
 Location :Rt390I&Rt15A NB OFF/ON RAMP

Data Services (585) 272-3424
 or (585) 272-3410

File Name : RT390I&15A NB
 Site Code : 00430092
 Start Date : 3/17/2005
 Page No : 2

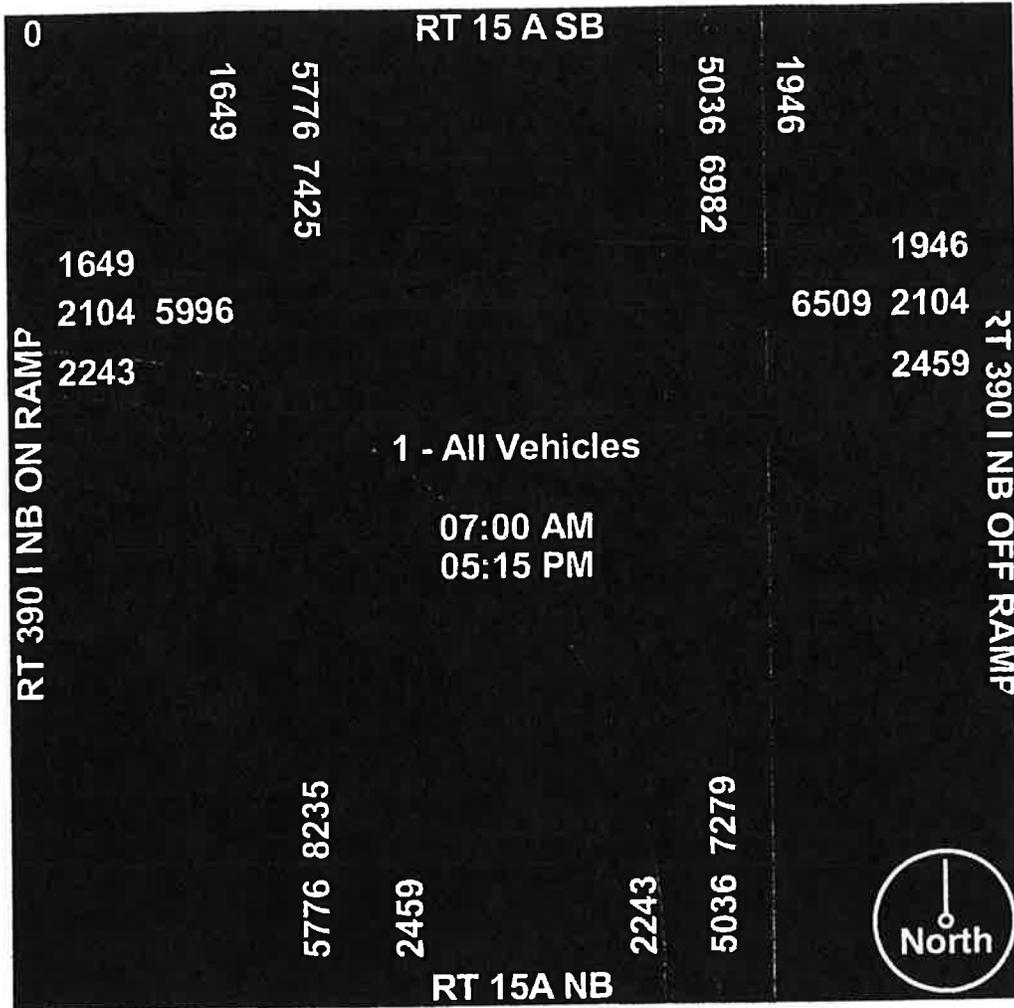


N.Y.S. Department of Transportation
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Start Date : 3/17/2005
Page No : 3

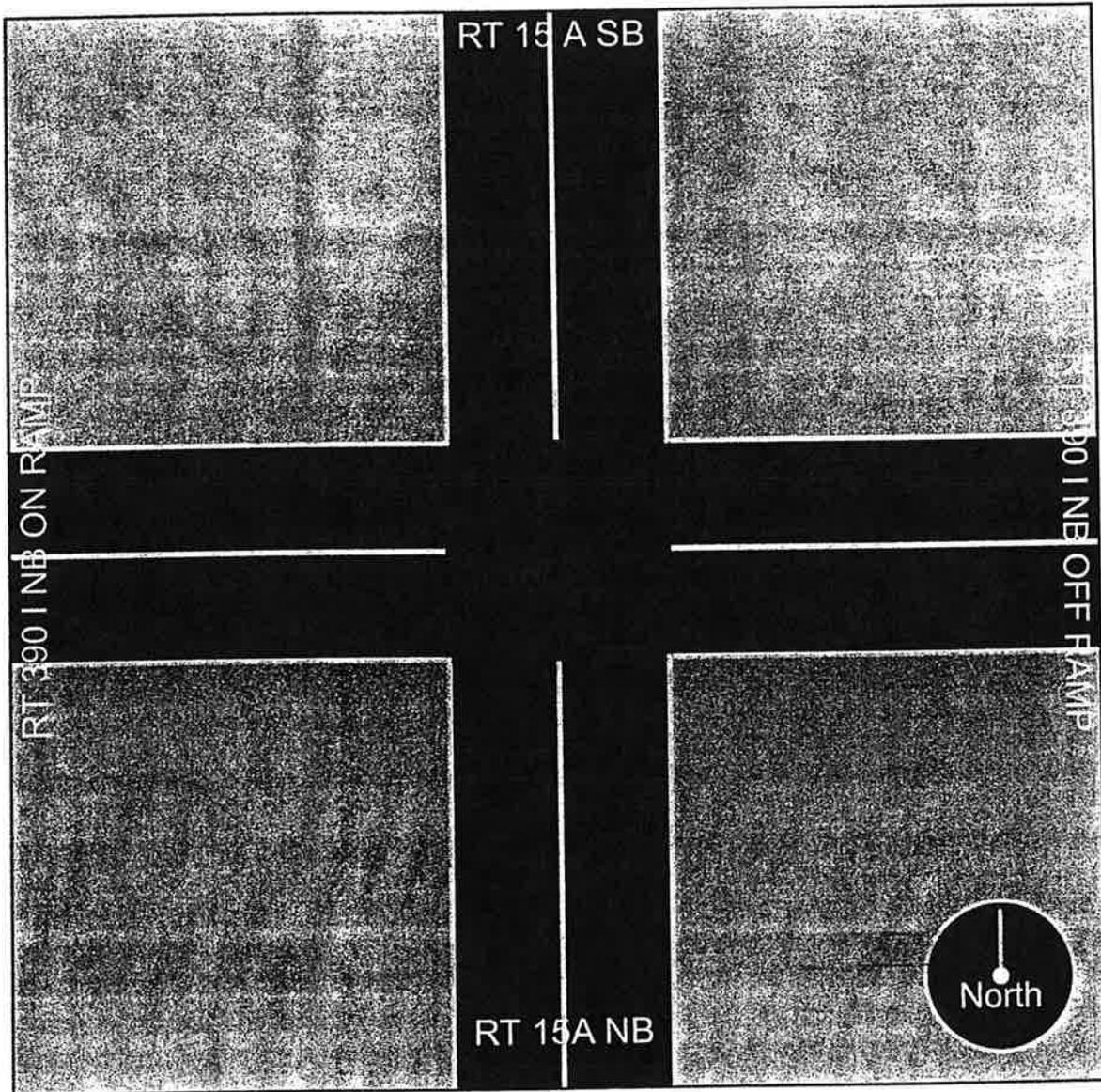


N.Y.S. Department of Transportation
1530 Jefferson Rd Rochester, N.Y.

Data Services (585) 272-3424
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File Name : RT390I&15A NB
Site Code : 00430092
Start Date : 3/17/2005
Page No : 4

Weather : Clear
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N.Y.S. Department of Transportation
1530 Jefferson Rd Rochester, N.Y.

Weather : Clear
Counted by :B. Bennett & B. Mase
Board # :T-481 & T-1051
Location :Rt390I&Rt15A NB OFF/ON RAMP

Data Services (585) 272-3424
or (585) 272-3410

File Name : RT390I&15A NB
Site Code : 00430092
Start Date : 3/17/2005
Page No : 1

Groups Printed- Large Trucks

Start Time	RT 15 A SB Southbound					RT 390 I NB OFF RAMP Westbound					RT 15A NB Northbound					RT 390 I NB ON RAMP Eastbound					Int. Total
	Rig ht	Thru	Left	Ped s	App. Total	Rig ht	Thru	Left	Ped s	App. Total	Rig ht	Thru	Left	Ped s	App. Total	Rig ht	Thru	Left	Ped s	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0
07:15 AM	2	0	0	0	2	2	0	2	0	4	0	1	5	0	6	0	0	0	0	0	0
07:30 AM	2	0	0	0	2	1	1	0	0	2	0	0	1	0	1	0	0	0	0	0	0
07:45 AM	1	2	0	0	3	1	0	0	0	1	0	1	4	0	5	0	0	0	0	0	0
Total	5	2	0	0	7	4	1	2	0	7	0	2	14	0	16	0	0	0	0	0	0
08:00 AM	0	4	0	0	4	0	1	0	0	1	0	3	0	0	3	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	1	0	1	0	0	2	0	2	0	0	0	0	0	0
08:30 AM	1	0	0	0	1	1	1	0	0	2	0	2	0	0	2	0	0	0	0	0	0
08:45 AM	0	2	0	0	2	1	2	1	0	4	0	4	0	0	4	0	0	0	0	0	0
Total	1	6	0	0	7	2	4	2	0	8	0	9	2	0	11	0	0	0	0	0	0
12:00 PM	0	1	0	0	1	0	3	2	0	5	0	0	1	0	1	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	1	1	0	2	0	0	2	0	2	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	1	3	0	4	0	0	1	0	1	0	0	0	0	0	0
12:45 PM	0	2	0	0	2	0	2	0	0	2	0	2	2	0	4	0	0	0	0	0	0
Total	0	3	0	0	3	0	7	6	0	13	0	2	6	0	8	0	0	0	0	0	0
02:00 PM	0	1	0	0	1	1	1	1	0	3	0	1	1	0	2	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	2	0	2	0	1	3	0	4	0	0	0	0	0	0
02:30 PM	1	0	0	0	1	0	1	2	0	3	0	1	2	0	3	0	0	0	0	0	0
02:45 PM	0	2	0	0	2	0	3	1	0	4	0	0	2	0	2	0	0	0	0	0	0
Total	1	3	0	0	4	1	5	6	0	12	0	3	8	0	11	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	2	1	0	3	0	1	1	0	2	0	0	0	0	0	0
03:15 PM	0	1	0	0	1	0	2	2	0	4	0	0	1	0	1	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	1	5	1	0	7	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	1	10	4	0	15	0	2	2	0	4	0	0	0	0	0	0
04:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	3	0	4	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0
Total	1	0	0	0	1	0	2	1	0	3	0	2	4	0	6	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	1	1	0	0	2	0	0	1	0	1	0	0	0	0	0	0
Grand Total	8	15	0	0	23	10	31	21	0	62	0	20	37	0	57	0	0	0	0	0	142
Apprch %	34.8	65.2	0.0	0.0		16.1	50.0	33.9	0.0		0.0	35.1	64.9	0.0		0.0	0.0	0.0	0.0		
Total %	5.6	10.6	0.0	0.0	16.2	7.0	21.8	14.8	0.0	43.7	0.0	14.1	26.1	0.0	40.1	0.0	0.0	0.0	0.0	0.0	

N.Y.S. Department of Transportation
 1530 Jefferson Rd Rochester, N.Y.

Data Services (585) 272-3424
 or (585) 272-3410

File Name : RT390I&15A NB

Site Code : 00430092

Start Date : 3/17/2005

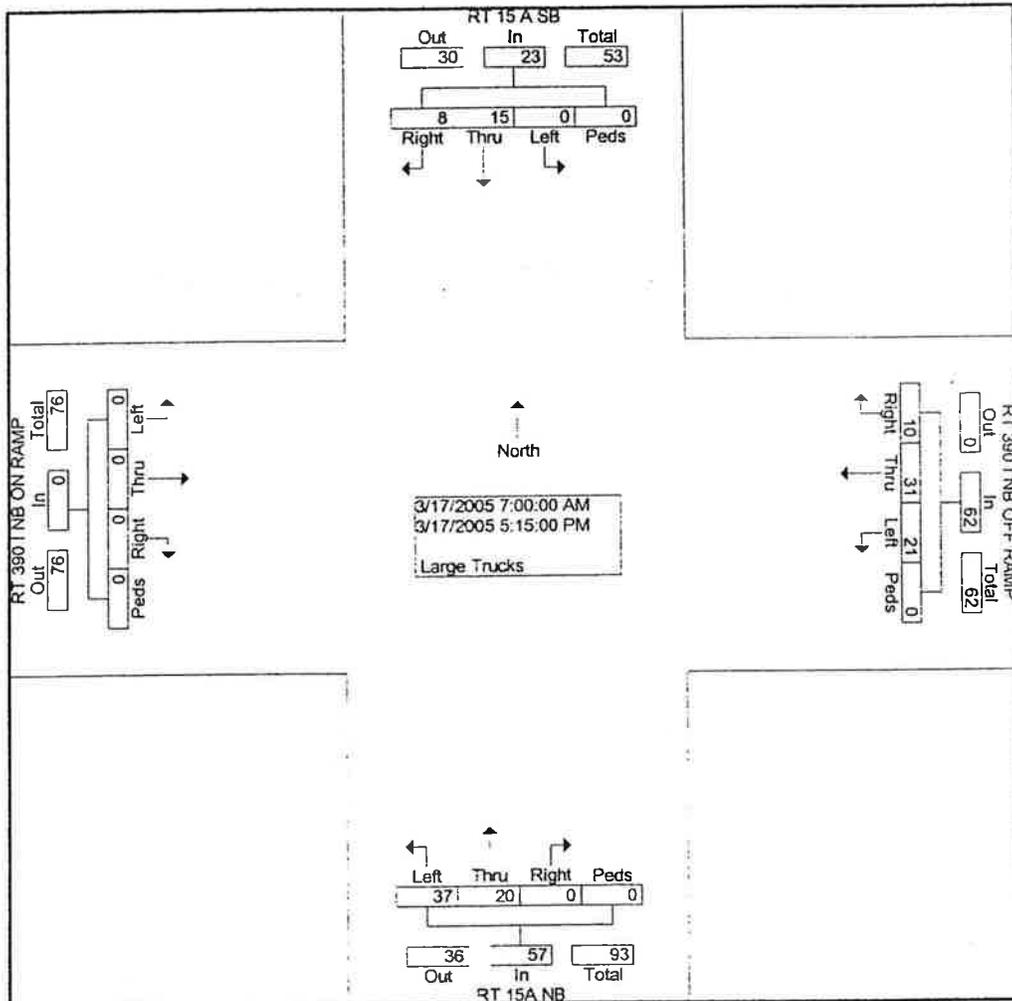
Page No : 2

Weather : Clear

Counted by : B. Bennett & B. Mase

Board # : T-481 & T-1051

Location : Rt390I&Rt15A NB OFF/ON RAMP



N.Y.S. Department of Transportation
1530 Jefferson Rd Rochester, N.Y.

Data Services (585) 272-3424
or (585) 272-3410

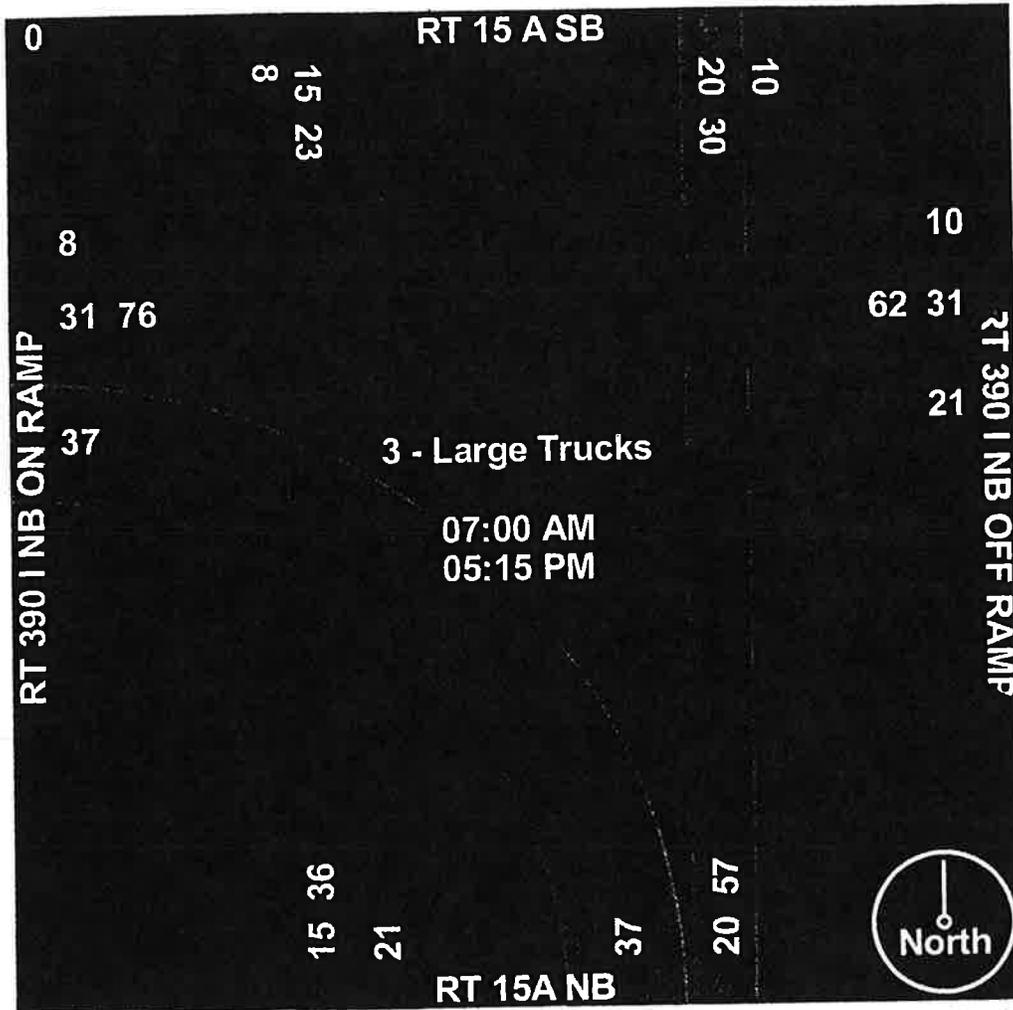
File Name : RT390I&15A NB
Site Code : 00430092
Start Date : 3/17/2005
Page No : 3

Weather : Clear

Counted by :B. Bennett & B. Mase

Board # :T-481 & T-1051

Location :Rt390I&Rt15A NB OFF/ON RAMP



N.Y.S. Department of Transportation
1530 Jefferson Rd Rochester, N.Y.

Weather : Clear

Counted by :B. Bennett & B. Mase

Board # :T-481 & T-1051

Location :Rt390I&Rt15A NB OFF/ON RAMP

Data Services (585) 272-3424

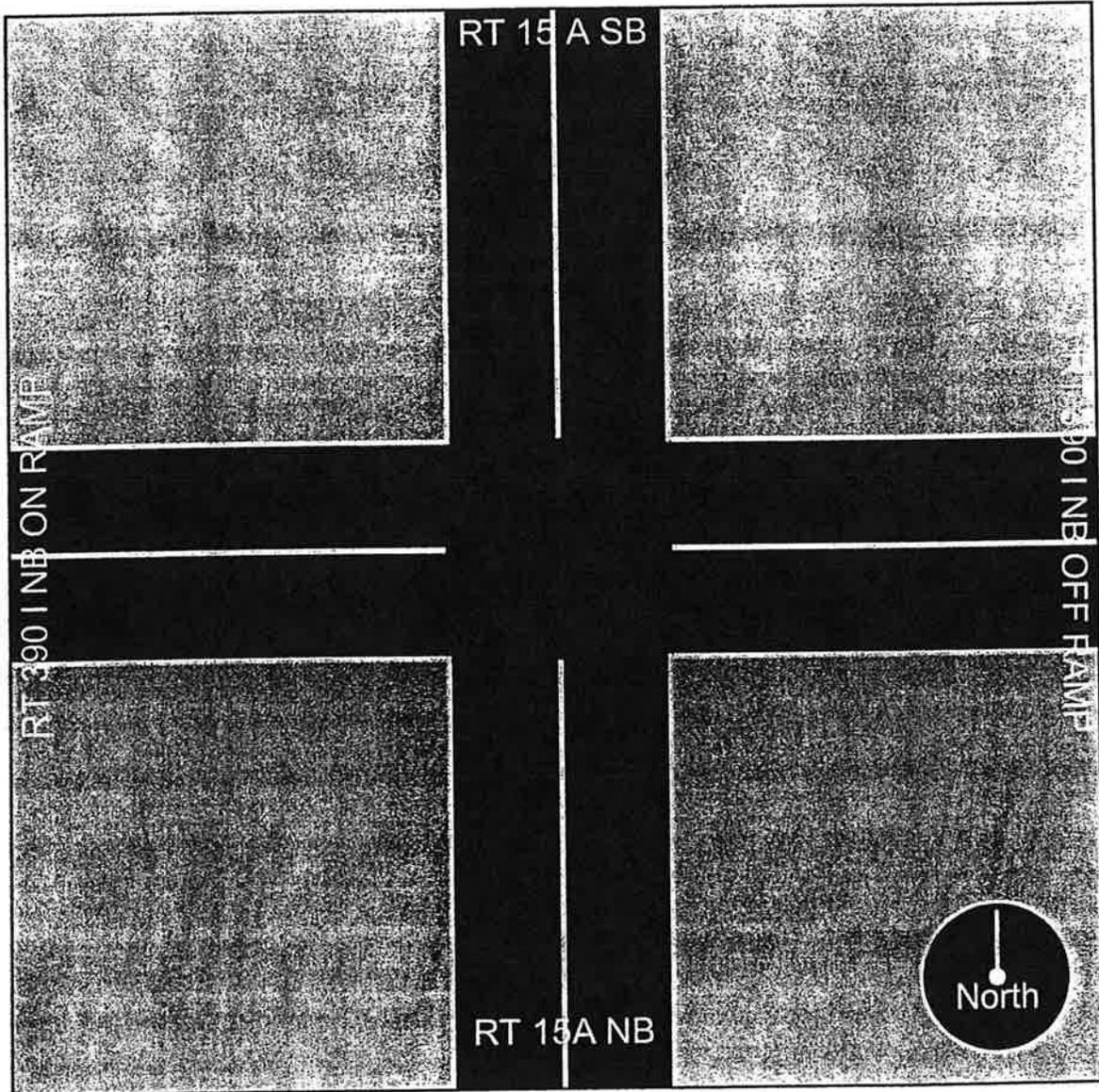
or (585) 272-3410

File Name : RT390I&15A NB

Site Code : 00430092

Start Date : 3/17/2005

Page No : 4



N.Y.S. Department of Transportation
1530 Jefferson Rd Rochester, N.Y.

Weather : Clear
Counted by : B. Bennett & B. Mase
Board # : T-481 & T-1051
Location : Rt390I&Rt15A NB OFF/ON RAMP

Data Services (585) 272-3424
or (585) 272-3410

File Name : RT390I&15A NB
Site Code : 00430092
Start Date : 3/17/2005
Page No : 1

Groups Printed: Right on Reds

Start Time	RT 15 A SB Southbound					RT 390 I NB OFF RAMP Westbound					RT 15A NB Northbound					RT 390 I NB ON RAMP Eastbound					Int. Total
	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:15 AM	0	0	0	0	0	11	0	0	0	11	0	0	0	0	0	0	0	0	0	0	11
07:30 AM	0	0	0	0	0	65	0	0	0	65	0	0	0	0	0	0	0	0	0	0	65
07:45 AM	0	0	0	0	0	62	0	0	0	62	0	0	0	0	0	0	0	0	0	0	62
Total	0	0	0	0	0	138	0	0	0	138	0	0	0	0	0	0	0	0	0	0	138
08:00 AM	0	0	0	0	0	65	0	0	0	65	0	0	0	0	0	0	0	0	0	0	65
08:15 AM	0	0	0	0	0	51	0	0	0	51	0	0	0	0	0	0	0	0	0	0	51
08:30 AM	0	0	0	0	0	53	0	0	0	53	0	0	0	0	0	0	0	0	0	0	53
08:45 AM	0	0	0	0	0	56	0	0	0	56	0	0	0	0	0	0	0	0	0	0	56
Total	0	0	0	0	0	225	0	0	0	225	0	0	0	0	0	0	0	0	0	0	225
12:00 PM	0	0	0	0	0	42	0	0	0	42	0	0	0	0	0	0	0	0	0	0	42
12:15 PM	0	0	0	0	0	52	0	0	0	52	0	0	0	0	0	0	0	0	0	0	52
12:30 PM	0	0	0	0	0	36	0	0	0	36	0	0	0	0	0	0	0	0	0	0	36
12:45 PM	0	0	0	0	0	57	0	0	0	57	0	1	0	0	1	0	0	0	0	0	58
Total	0	0	0	0	0	187	0	0	0	187	0	1	0	0	1	0	0	0	0	0	188
2:00 PM	0	0	0	0	0	40	0	0	0	40	0	0	0	0	0	0	0	0	0	0	40
02:15 PM	0	0	0	0	0	37	0	0	0	37	0	0	0	0	0	0	0	0	0	0	37
02:30 PM	0	0	0	0	0	49	0	0	0	49	0	0	0	0	0	0	0	0	0	0	49
02:45 PM	0	0	0	0	0	43	0	0	1	44	0	0	0	0	0	0	0	0	0	0	44
Total	0	0	0	0	0	169	0	0	1	170	0	0	0	0	0	0	0	0	0	0	170
03:00 PM	0	0	0	0	0	49	0	0	0	49	0	0	0	0	0	0	0	0	0	0	49
03:15 PM	0	0	0	0	0	54	0	0	0	54	0	0	0	0	0	0	0	0	0	0	54
03:30 PM	0	0	0	0	0	40	0	0	0	40	0	0	0	0	0	0	0	0	0	0	40
03:45 PM	0	0	0	0	0	48	0	0	1	49	0	0	0	0	0	0	0	0	0	0	49
Total	0	0	0	0	0	191	0	0	1	192	0	0	0	0	0	0	0	0	0	0	192
04:00 PM	0	0	0	0	0	46	0	0	0	46	0	0	0	0	0	0	0	0	0	0	46
04:15 PM	0	0	0	0	0	41	0	0	0	41	0	0	0	0	0	0	0	0	0	0	41
04:30 PM	0	0	0	0	0	34	0	0	0	34	0	0	0	0	0	0	0	0	0	0	34
04:45 PM	0	0	0	0	0	42	0	0	0	42	0	0	0	0	0	0	0	0	0	0	42
Total	0	0	0	0	0	163	0	0	0	163	0	0	0	0	0	0	0	0	0	0	163
05:00 PM	0	0	0	0	0	51	0	0	0	51	0	0	0	0	0	0	0	0	0	0	51
05:15 PM	0	0	0	0	0	42	0	0	0	42	0	0	0	0	0	0	0	0	0	0	42
Grand Total	0	0	0	0	0	1166	0	0	2	1168	0	1	0	0	1	0	0	0	0	0	1169
Apprch %	0.0	0.0	0.0	0.0		99.8	0.0	0.0	0.2		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	99.7	0.0	0.0	0.2	99.9	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	

N.Y.S. Department of Transportation
 1530 Jefferson Rd Rochester, N.Y.

Data Services (585) 272-3424
 or (585) 272-3410

File Name : RT390I&15A NB

Site Code : 00430092

Start Date : 3/17/2005

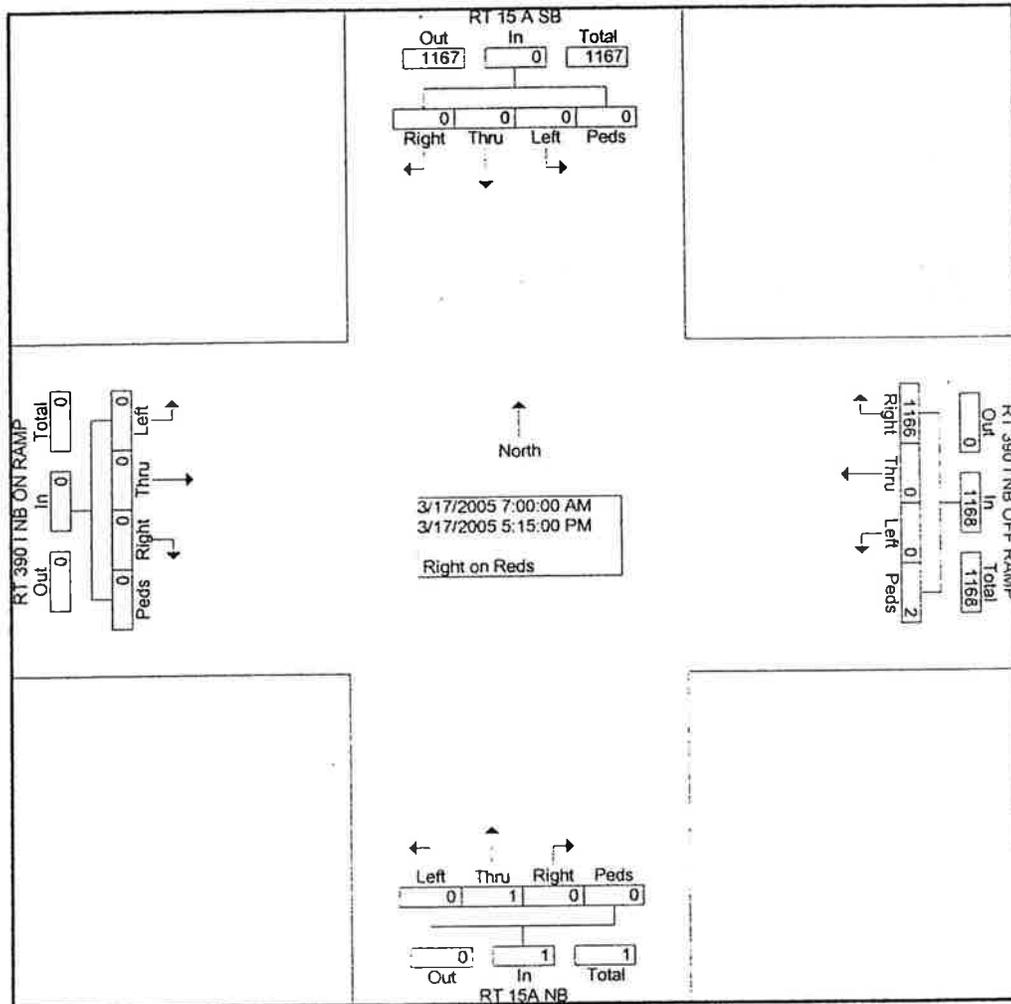
Page No : 2

Weather : Clear

Counted by : B. Bennett & B. Mase

Board # : T-481 & T-1051

Location : Rt390I&Rt15A NB OFF/ON RAMP

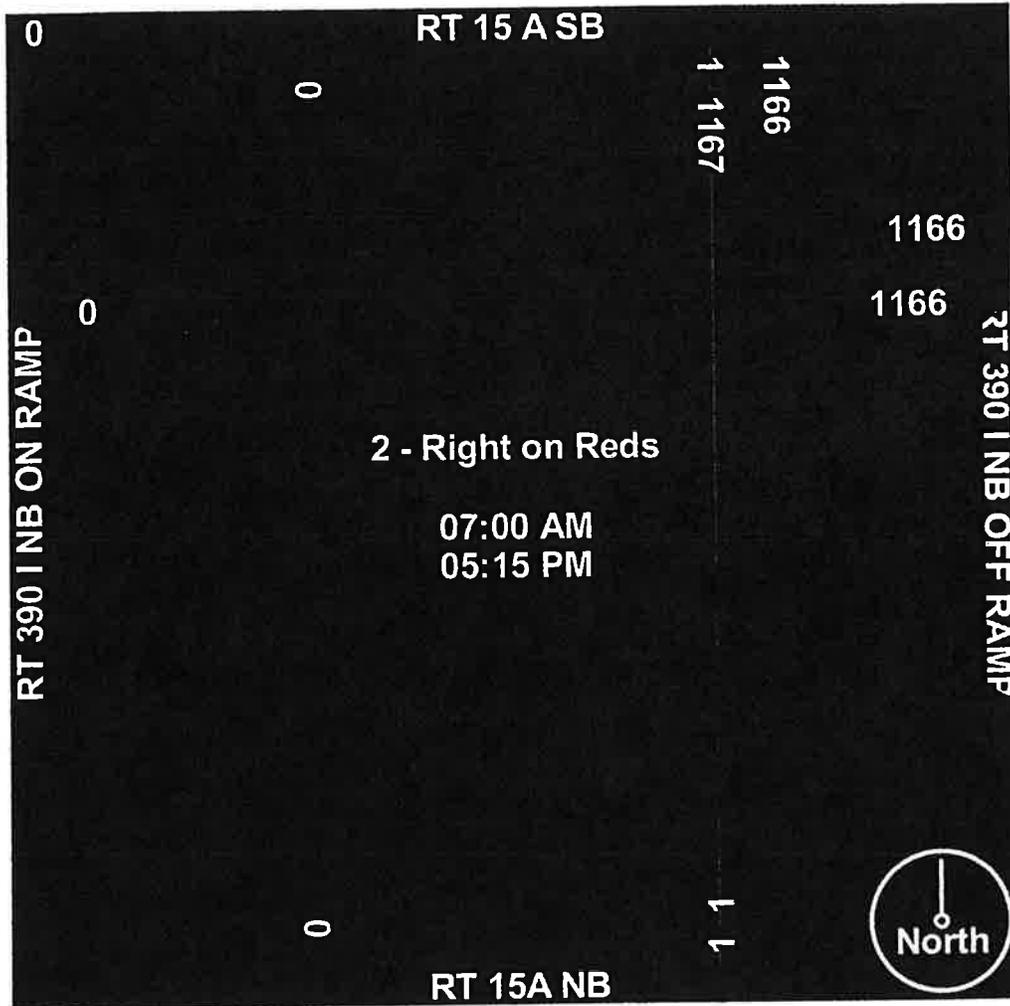


N.Y.S. Department of Transportation
1530 Jefferson Rd Rochester, N.Y.

Data Services (585) 272-3424
or (585) 272-3410

File Name : RT390I&15A NB
Site Code : 00430092
Start Date : 3/17/2005
Page No : 3

Weather : Clear
Mounted by : B. Bennett & B. Mase
Board # : T-481 & T-1051
Location : Rt390I&Rt15A NB OFF/ON RAMP



N.Y.S. Department of Transportation
1530 Jefferson Rd Rochester, N.Y.

Data Services (585) 272-3424
or (585) 272-3410

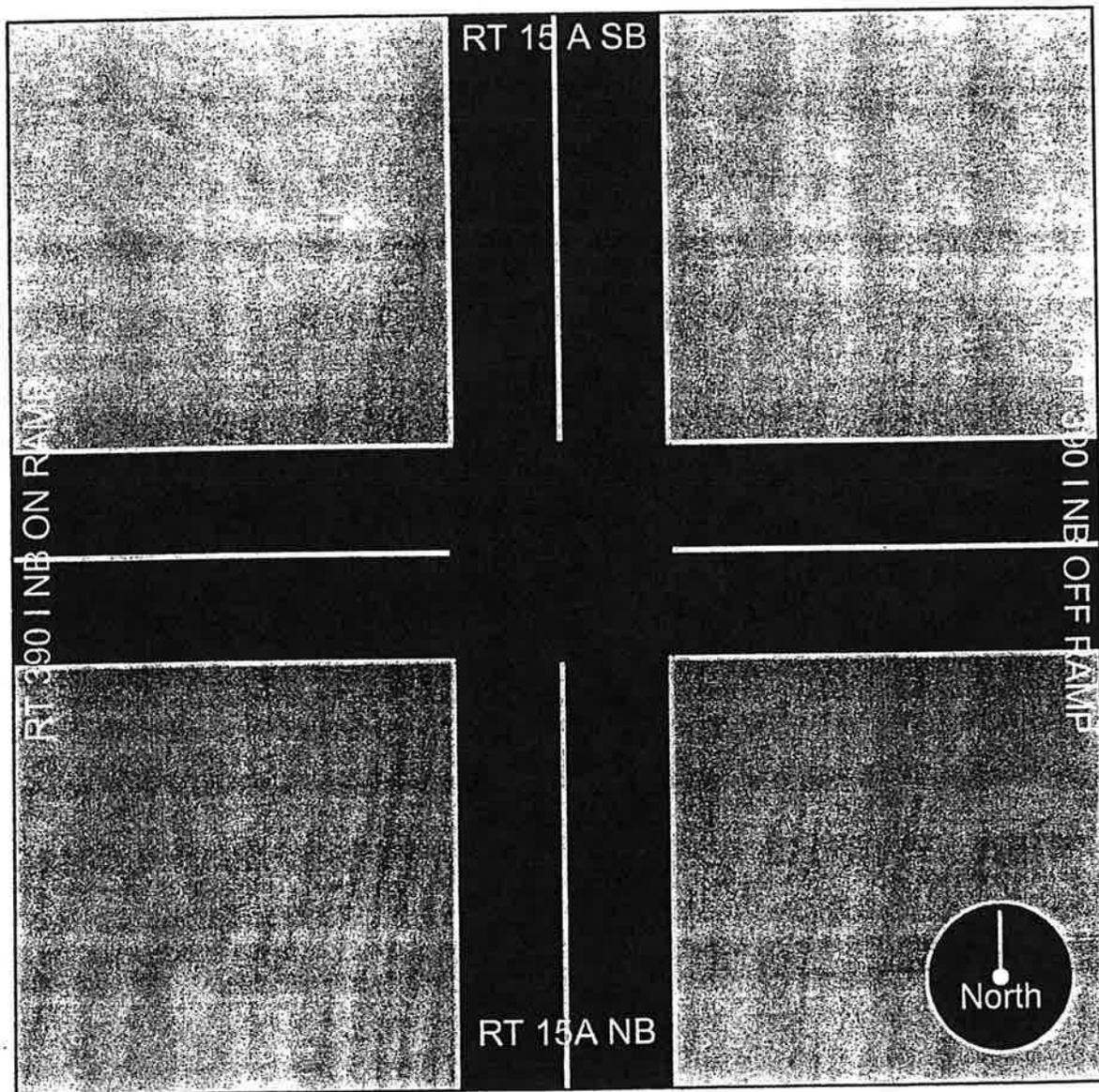
File Name : RT390I&15A NB
Site Code : 00430092
Start Date : 3/17/2005
Page No : 4

Weather : Clear

Counted by : B. Bennett & B. Mase

Board # : T-481 & T-1051

Location : Rt390I&Rt15A NB OFF/ON RAMP

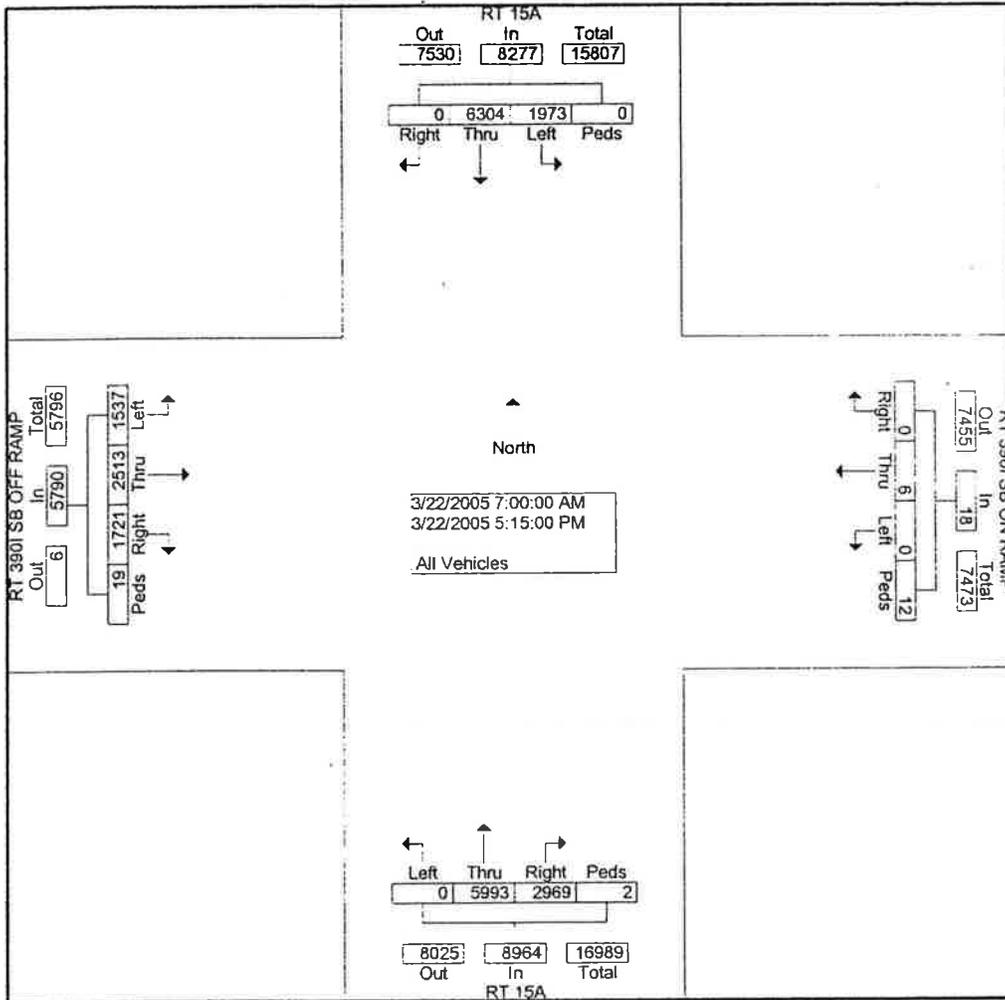


N.Y.S. Department of Transportation
 1530 Jefferson Rd Rochester, N.Y.

Weather : Clear
 Counted by : B. Bennett & B. Mase
 Board # : T-1051 & T-481
 Location : RT390I SB Ramps & 15A

Data Services (585) 272-3424
 or (585) 272-3410

File Name : RT390ISB&15A
 Site Code : 00430092
 Start Date : 3/22/2005
 Page No : 2

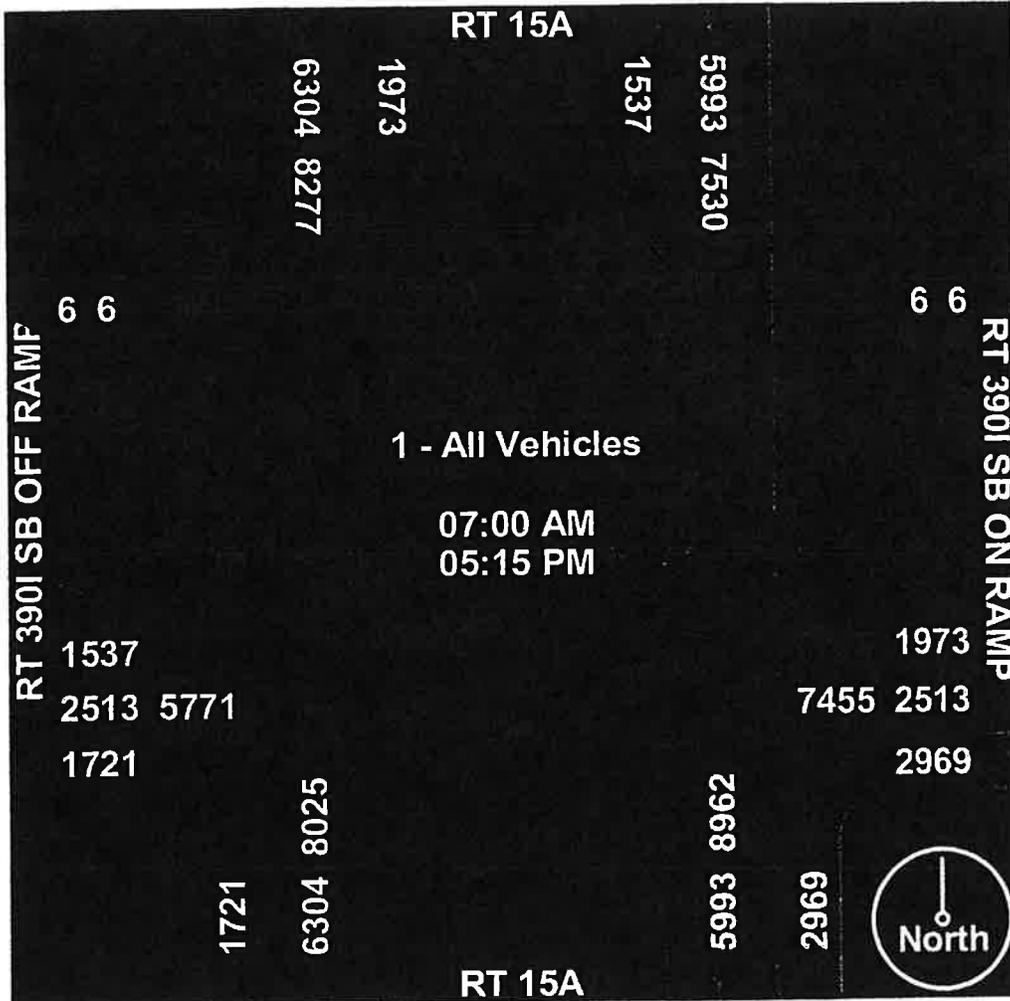


N.Y.S. Department of Transportation
1530 Jefferson Rd Rochester, N.Y.

Data Services (585) 272-3424
or (585) 272-3410

File Name : RT390ISB&15A
Site Code : 00430092
Start Date : 3/22/2005
Page No : 3

Weather : Clear
Mounted by : B. Bennett & B. Mase
Board # : T-1051 & T-481
Location : RT390I SB Ramps & 15A

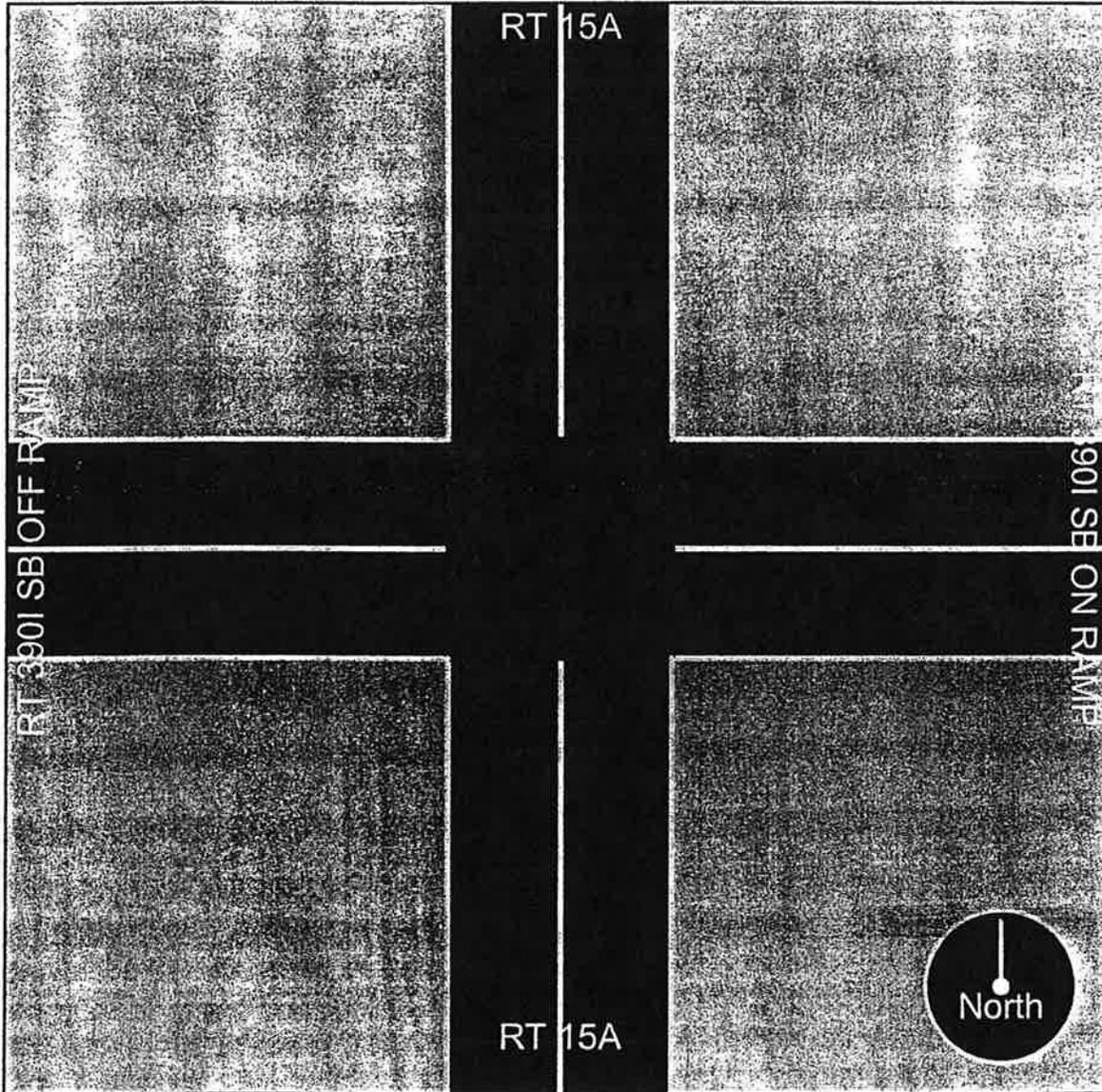


N.Y.S. Department of Transportation
1530 Jefferson Rd Rochester, N.Y.

Weather : Clear
Counted by : B. Bennett & B. Mase
Board # : T-1051 & T-481
Location : RT390I SB Ramps & 15A

Data Services (585) 272-3424
or (585) 272-3410

File Name : RT390ISB&15A
Site Code : 00430092
Start Date : 3/22/2005
Page No : 4



N.Y.S. Department of Transportation
1530 Jefferson Rd Rochester, N.Y.

Data Services (585) 272-3424
or (585) 272-3410

File Name : RT390ISB&15A
Site Code : 00430092
Start Date : 3/22/2005
Page No : 1

Weather : Clear
Counted by : B. Bennett & B. Mase
Board # : T-1051 & T-481
Location : RT390I SB Ramps & 15A

Groups Printed- Right on Reds

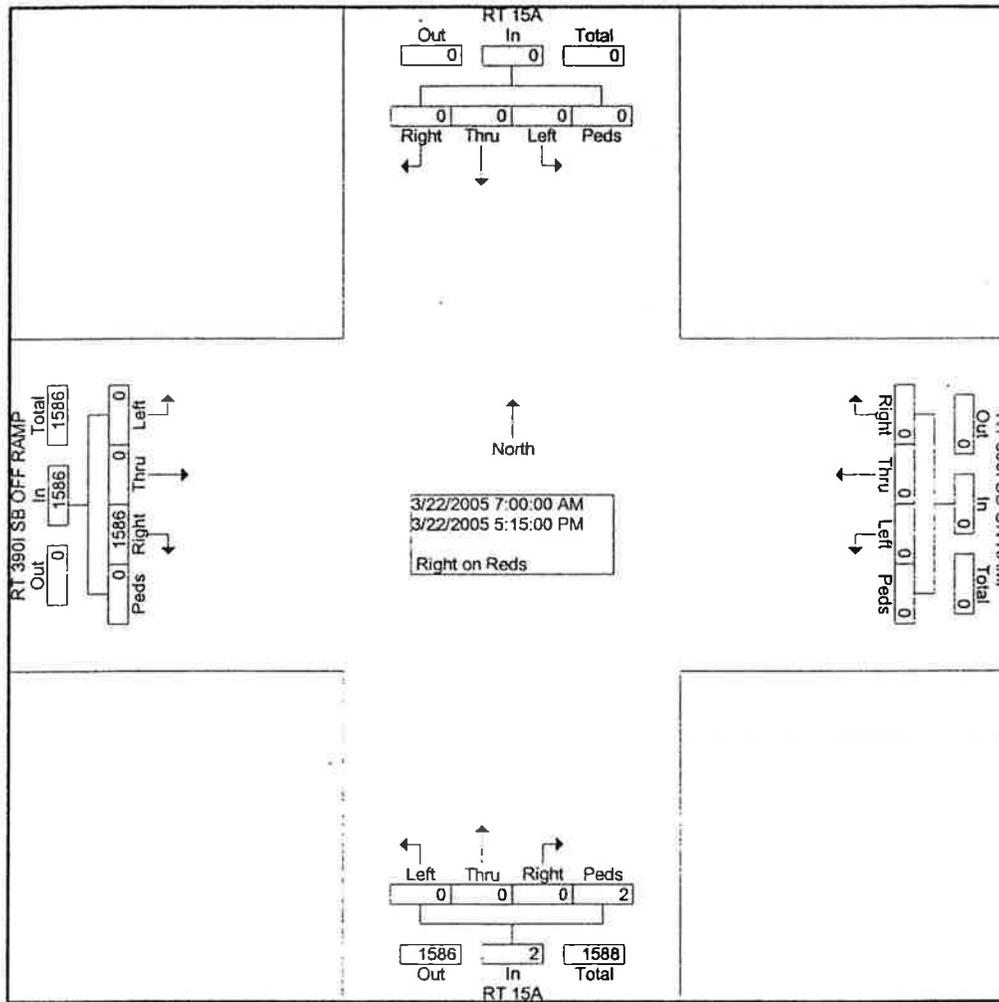
Start Time	RT 15A Southbound					RT 390I SB ON RAMP Westbound					RT 15A Northbound					RT 390I SB OFF RAMP Eastbound					Int. Total
	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	79	0	0	0	79	80
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	136	0	0	0	136	136
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	107	0	0	0	107	107
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	0	0	0	74	74
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	396	0	0	0	396	397
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	0	0	0	74	74
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	0	0	0	70	70
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	0	0	0	85	85
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88	0	0	0	88	88
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	317	0	0	0	317	317
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49	0	0	0	49	49
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	0	0	59	59
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51	0	0	0	51	51
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	0	0	0	47	47
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	206	0	0	0	206	206
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	0	0	0	56	56
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0	0	0	35	35
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91	0	0	0	91	91
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0	0	0	32	32
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	214	0	0	0	214	214
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0	0	0	32	32
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49	0	0	0	49	49
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	0	0	0	44	44
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0	0	0	48	48
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	173	0	0	0	173	173
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0	0	0	45	45
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	0	0	0	47	47
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	0	0	59	59
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	44	0	0	0	44	45
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	195	0	0	0	195	196
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0	0	0	37	37
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0	0	0	48	48
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1586	0	0	0	1586	1588
Apprch %	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	100.0		100.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	99.9	0.0	0.0	0.0	99.9	

N.Y.S. Department of Transportation
 1530 Jefferson Rd Rochester, N.Y.

Weather : Clear
 Counted by : B. Bennett & B. Mase
 Board # : T-1051 & T-481
 Location : RT390I SB Ramps & 15A

Data Services (585) 272-3424
 or (585) 272-3410

File Name : RT390ISB&15A
 Site Code : 00430092
 Start Date : 3/22/2005
 Page No : 2

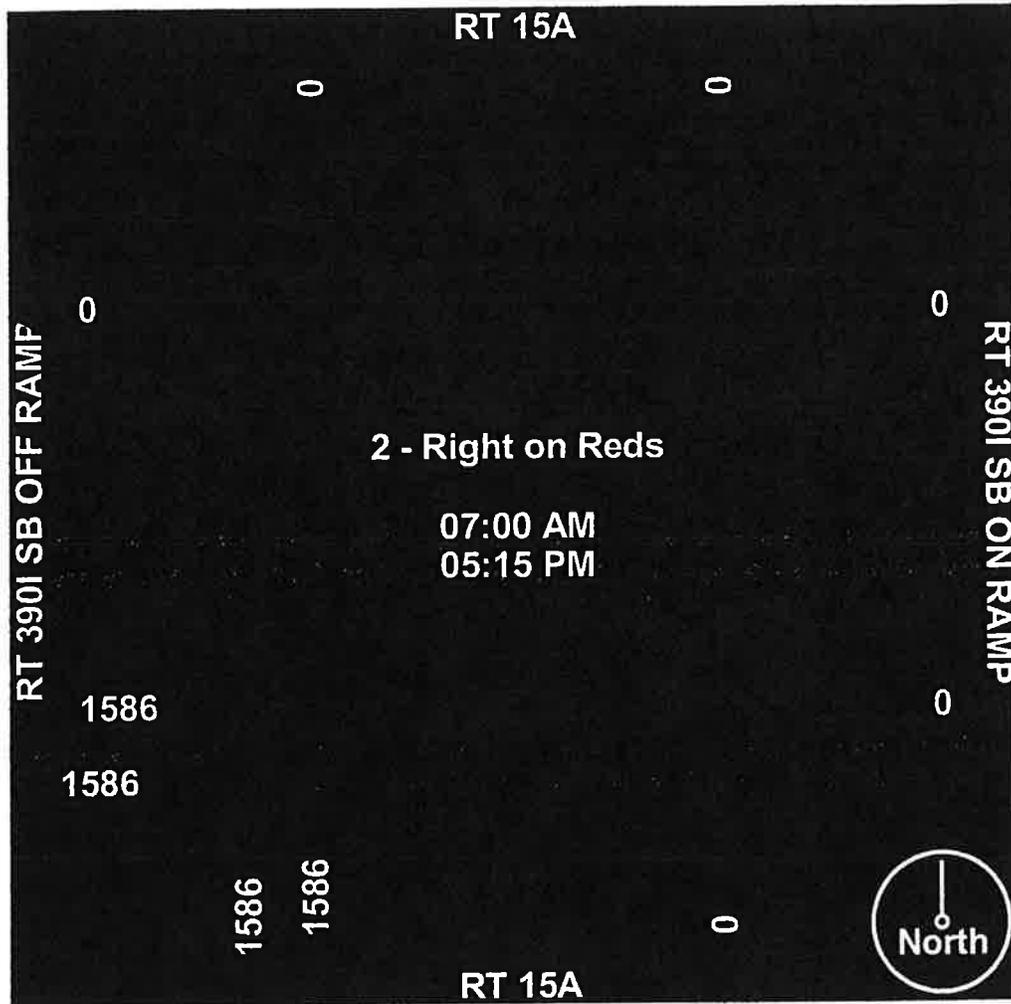


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Start Date : 3/22/2005
Page No : 3

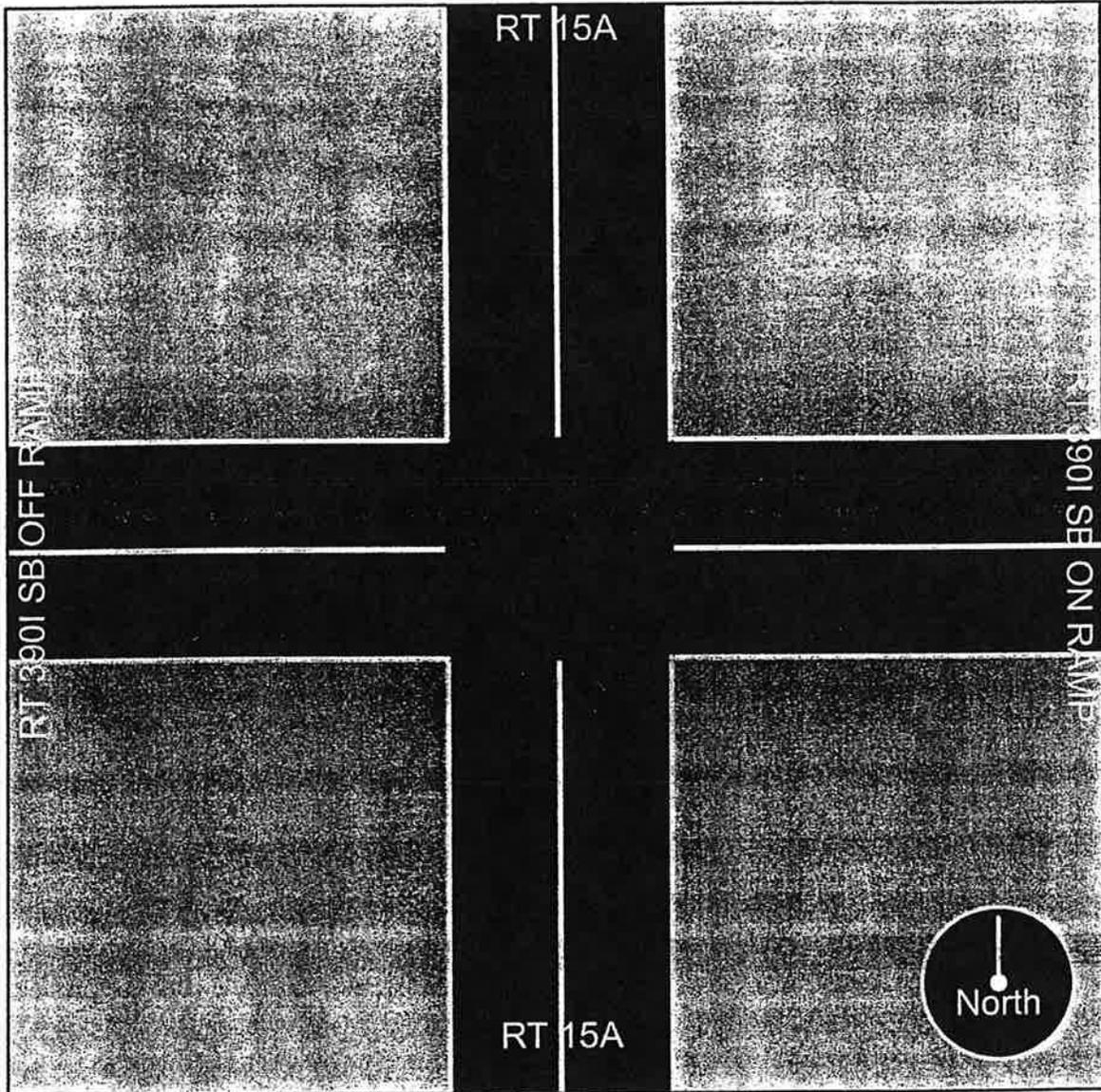


N.Y.S. Department of Transportation
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N.Y.S. Department of Transportation
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File Name : RT390ISB&15A
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Start Date : 3/22/2005
Page No : 1

Groups Printed - Large Trucks

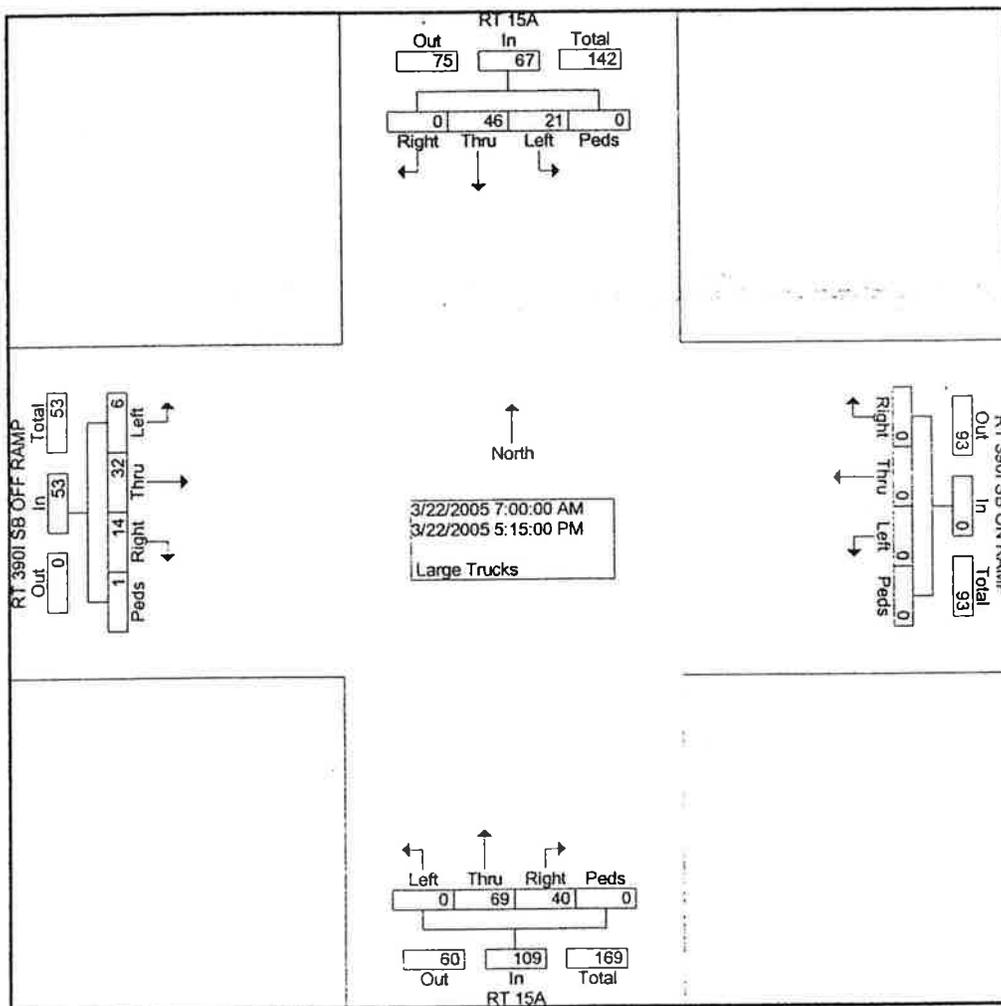
Start Time	RT 15A Southbound					RT 390I SB ON RAMP Westbound					RT 15A Northbound					RT 390I SB OFF RAMP Eastbound					Int. Total
	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	Rig ht	Thr u	Left	Ped s	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:00 AM	0	3	0	0	3	0	0	0	0	0	4	9	0	0	13	0	0	0	0	0	16
07:15 AM	0	3	0	0	3	0	0	0	0	0	1	8	0	0	9	1	1	0	0	2	14
07:30 AM	0	2	0	0	2	0	0	0	0	0	3	5	0	0	8	0	2	0	0	2	12
07:45 AM	0	1	3	0	4	0	0	0	0	0	4	6	0	0	10	0	2	0	0	2	16
Total	0	9	3	0	12	0	0	0	0	0	12	28	0	0	40	1	5	0	0	6	58
08:00 AM	0	4	3	0	7	0	0	0	0	0	5	6	0	0	11	2	3	2	0	7	25
08:15 AM	0	1	2	0	3	0	0	0	0	0	3	7	0	0	10	1	3	1	0	5	18
08:30 AM	0	2	2	0	4	0	0	0	0	0	2	5	0	0	7	2	3	1	0	6	17
08:45 AM	0	1	0	0	1	0	0	0	0	0	1	5	0	0	6	0	0	0	0	0	7
Total	0	8	7	0	15	0	0	0	0	0	11	23	0	0	34	5	9	4	0	18	67
12:00 PM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	1	2	0	0	3	7
12:15 PM	0	2	0	0	2	0	0	0	0	0	2	1	0	0	3	1	1	0	0	2	7
12:30 PM	0	5	1	0	6	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	8
12:45 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
Total	0	11	1	0	12	0	0	0	0	0	2	4	0	0	6	2	5	0	0	7	25
02:00 PM	0	1	1	0	2	0	0	0	0	0	2	4	0	0	6	0	3	0	0	3	11
02:15 PM	0	2	1	0	3	0	0	0	0	0	2	2	0	0	4	1	0	0	0	1	8
02:30 PM	0	1	1	0	2	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	5
02:45 PM	0	2	1	0	3	0	0	0	0	0	2	3	0	0	5	1	0	0	1	2	10
Total	0	6	4	0	10	0	0	0	0	0	6	11	0	0	17	3	3	0	1	7	34
03:00 PM	0	1	1	0	2	0	0	0	0	0	3	0	0	0	3	0	1	0	0	1	6
03:15 PM	0	1	1	0	2	0	0	0	0	0	1	1	0	0	2	0	1	0	0	1	5
03:30 PM	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	3
03:45 PM	0	1	1	0	2	0	0	0	0	0	1	1	0	0	2	0	1	0	0	1	5
Total	0	3	4	0	7	0	0	0	0	0	6	2	0	0	8	0	4	0	0	4	19
04:00 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	4
04:15 PM	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	1	1	1	0	3	6
04:30 PM	0	2	0	0	2	0	0	0	0	0	2	0	0	0	2	0	1	0	0	1	5
04:45 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	4
Total	0	7	2	0	9	0	0	0	0	0	2	0	0	0	2	2	5	1	0	8	19
05:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	3
05:15 PM	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	0	1	0	0	1	4
Grand Total	0	46	21	0	67	0	0	0	0	0	40	69	0	0	109	14	32	6	1	53	229
Apprch %	0.0	68.7	31.3	0.0		0.0	0.0	0.0	0.0		36.7	63.3	0.0	0.0		26.4	60.4	11.3	1.9		
Total %	0.0	20.1	9.2	0.0	29.3	0.0	0.0	0.0	0.0	0.0	17.5	30.1	0.0	0.0	47.6	6.1	14.0	2.6	0.4	23.1	

N.Y.S. Department of Transportation
 1530 Jefferson Rd Rochester, N.Y.

Weather : Clear
 Counted by : B. Bennett & B. Mase
 Board # : T-1051 & T-481
 Location : RT390I SB Ramps & 15A

Data Services (585) 272-3424
 or (585) 272-3410

File Name : RT390ISB&15A
 Site Code : 00430092
 Start Date : 3/22/2005
 Page No : 2

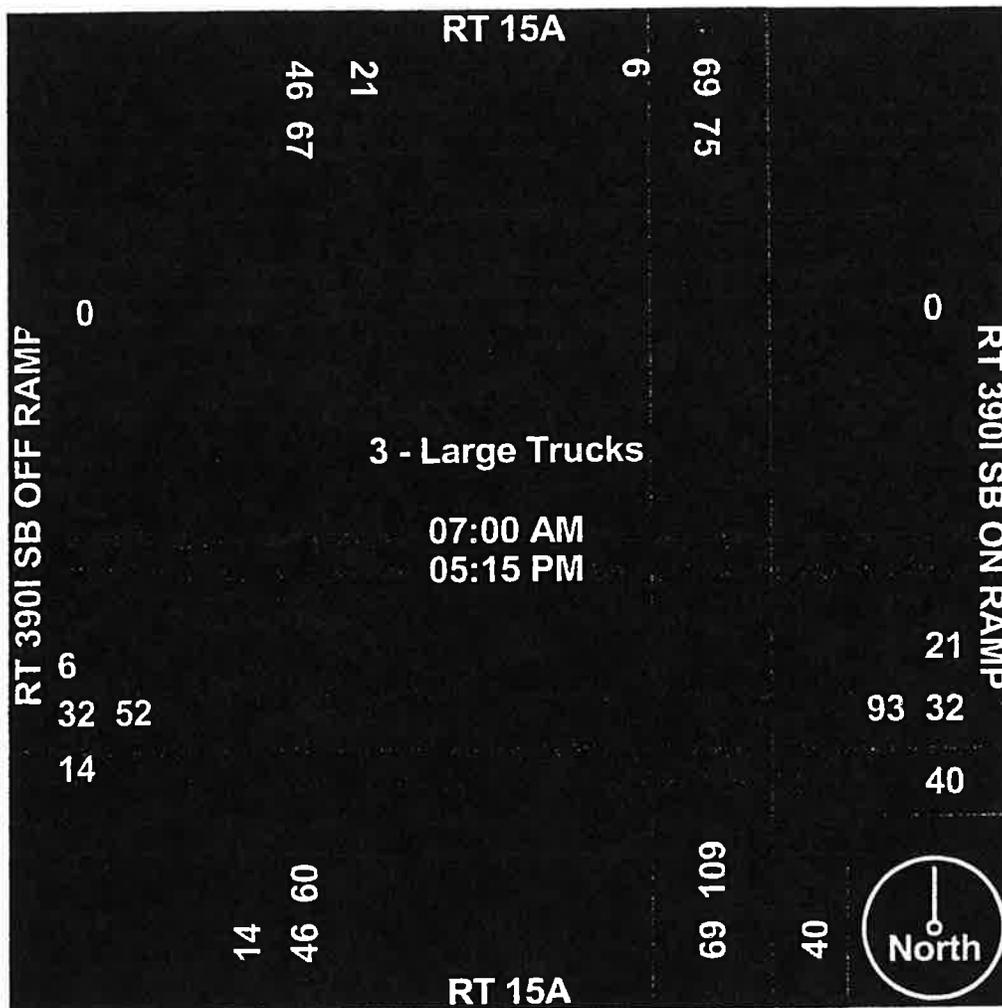


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Counted by : B. Bennett & B. Mase
Board # : T-1051 & T-481
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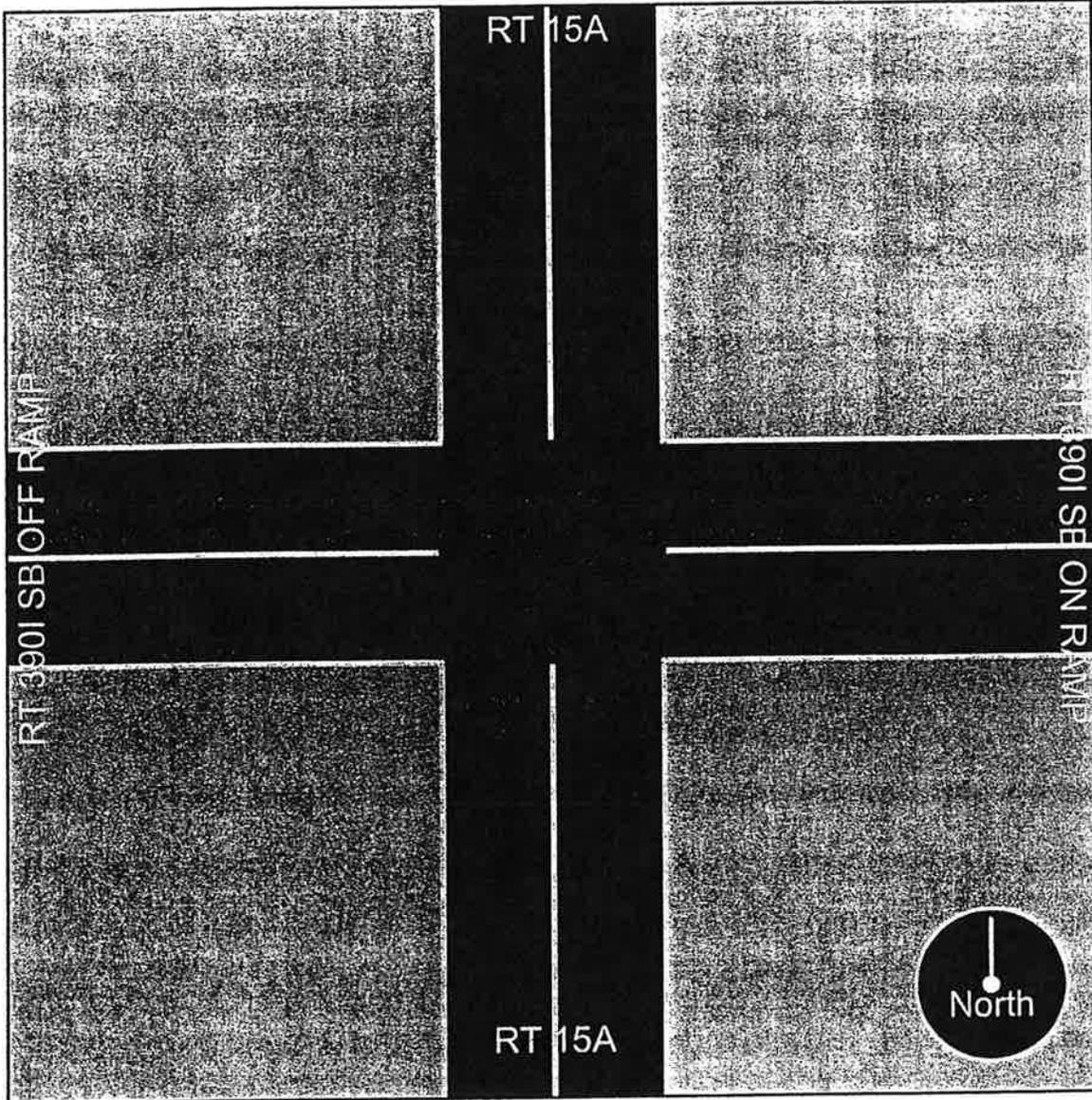


N.Y.S. Department of Transportation
1530 Jefferson Rd Rochester, N.Y.

Data Services (585) 272-3424
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File Name : RT390ISB&15A
Site Code : 00430092
Start Date : 3/22/2005
Page No : 2

Weather : Clear
Mounted by : B. Bennett & B. Mase
Board # : T-1051 & T-481
Location : RT390I SB Ramps & 15A



FRA Engineering
530 Summit Point Drive
Henrietta, NY 14467

File Name : Med. Dentistry Driveway
 Site Code : 00000000
 Start Date : 12/18/2007
 Page No : 1

Groups Printed- Car - Truck - Bus

Start Time	U OF R DRIVWAY From North					ELMWOOD AVENUE From East					U OF R DRIVWAY From South					ELMWOOD AVENUE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
08:00 AM	0	0	0	10	10	0	208	14	2	224	7	0	11	8	26	7	191	0	1	199	459
08:15 AM	0	0	0	8	8	0	199	12	0	211	4	0	9	9	22	7	169	0	3	179	420
08:30 AM	0	0	0	3	3	0	160	10	0	170	5	0	6	4	15	8	150	0	0	158	346
08:45 AM	0	0	0	14	14	0	202	16	1	219	9	0	9	11	29	14	177	0	0	191	453
Total	0	0	0	35	35	0	769	52	3	824	25	0	35	32	92	36	687	0	4	727	1678
09:00 AM	0	0	0	9	9	0	177	13	0	190	10	0	8	12	30	19	123	0	2	144	373
09:15 AM	0	0	0	12	12	0	142	14	1	157	4	0	7	17	28	11	113	0	1	125	322
09:30 AM	0	0	0	11	11	0	156	9	3	168	7	0	5	18	30	9	128	0	1	138	347
09:45 AM	0	0	0	12	12	0	113	7	4	124	8	0	4	28	40	14	134	0	3	151	327
Total	0	0	0	44	44	0	588	43	8	639	29	0	24	75	128	53	498	0	7	558	1369
10:00 AM	0	0	0	21	21	0	110	6	3	119	6	0	8	20	34	7	126	0	2	135	309
10:15 AM	0	0	0	13	13	0	140	10	2	152	8	0	7	17	32	6	122	0	1	129	326
10:30 AM	0	0	0	9	9	0	122	12	1	135	5	0	8	21	34	1	120	0	2	123	301
10:45 AM	0	0	0	18	18	0	120	8	0	128	6	0	8	12	26	3	139	0	0	142	314
Total	0	0	0	61	61	0	492	36	6	534	25	0	31	70	126	17	507	0	5	529	1250
11:00 AM	0	0	0	18	18	0	117	8	0	125	5	0	4	15	24	6	106	0	0	112	279
11:15 AM	0	0	0	12	12	0	138	8	0	146	7	0	6	7	20	3	122	0	0	125	303
11:30 AM	0	0	0	14	14	0	145	2	0	147	8	0	6	14	28	3	124	0	1	128	317
11:45 AM	0	0	0	25	25	0	131	5	1	137	10	0	6	17	33	10	135	0	0	145	340
Total	0	0	0	69	69	0	531	23	1	555	30	0	22	53	105	22	487	0	1	510	1239
12:00 PM	0	0	0	37	37	0	139	5	2	146	5	0	6	32	43	8	120	0	0	128	354
12:15 PM	0	0	0	31	31	0	121	5	5	131	8	0	2	26	36	5	133	0	1	139	337
12:30 PM	0	0	0	31	31	0	118	6	5	129	5	0	2	18	25	7	112	0	0	119	304
12:45 PM	0	0	0	34	34	0	119	3	8	130	6	0	5	33	44	3	132	0	1	136	344
Total	0	0	0	133	133	0	497	19	20	536	24	0	15	109	148	23	497	0	2	522	1339
01:00 PM	0	0	0	17	17	0	132	6	1	139	7	0	1	23	31	6	122	0	4	132	319
01:15 PM	0	0	0	19	19	0	119	8	0	127	9	0	1	20	30	5	109	0	4	118	294
01:30 PM	0	0	0	16	16	0	148	10	1	159	9	0	9	30	48	9	130	0	2	141	364
01:45 PM	0	0	0	40	40	0	127	7	0	134	7	0	7	28	42	3	169	0	3	175	391
Total	0	0	0	92	92	0	526	31	2	559	32	0	18	101	151	23	530	0	13	566	1368
02:00 PM	0	0	0	11	11	0	118	8	4	130	4	0	8	24	36	8	143	0	2	153	330
02:15 PM	0	0	0	19	19	0	127	5	3	135	7	0	6	27	40	6	182	0	2	190	384
02:30 PM	0	0	0	27	27	0	161	2	4	167	1	0	5	26	32	4	163	0	1	168	394
02:45 PM	0	0	0	15	15	0	161	5	0	166	9	0	7	31	47	4	184	0	2	190	418
Total	0	0	0	72	72	0	567	20	11	598	21	0	26	108	155	22	672	0	7	701	1526
03:00 PM	0	0	0	15	15	0	161	5	0	166	5	0	6	14	25	12	186	0	0	198	404
03:15 PM	0	0	0	21	21	0	160	5	1	166	9	0	3	15	27	2	149	0	0	151	365
03:30 PM	0	0	0	12	12	0	237	6	6	249	10	0	2	15	27	5	193	0	1	199	487
03:45 PM	0	0	0	19	19	0	187	6	3	196	8	0	5	14	27	10	176	0	0	186	428
Total	0	0	0	67	67	0	745	22	10	777	32	0	16	58	106	29	704	0	1	734	1684
04:00 PM	0	0	0	23	23	0	215	6	2	223	12	0	9	13	34	8	174	0	0	182	462
04:15 PM	0	0	0	15	15	0	184	3	17	204	5	0	6	8	19	6	188	0	2	196	434
04:30 PM	0	0	0	25	25	0	246	6	7	259	4	0	7	10	21	10	223	0	0	233	538
04:45 PM	0	0	0	25	25	0	204	10	6	220	9	0	3	12	24	9	189	0	0	198	467
Total	0	0	0	88	88	0	849	25	32	906	30	0	25	43	98	33	774	0	2	809	1901
05:00 PM	0	0	0	12	12	0	229	6	9	244	12	0	7	18	37	4	218	0	1	223	516
05:15 PM	0	0	0	7	7	0	183	11	3	197	13	0	9	15	37	12	185	0	1	198	439
Grand Total	0	0	0	680	680	0	5976	288	105	6369	273	0	228	682	1183	274	5759	0	44	6077	14309
Apprch %	0	0	0	100		0	93.8	4.5	1.6		23.1	0	19.3	57.7		4.5	94.8	0	0.7		
Total %	0	0	0	4.8	4.8	0	41.8	2	0.7	44.5	1.9	0	1.6	4.8	8.3	1.9	40.2	0	0.3	42.5	
Car	0	0	0	680	680	0	5772	274	105	6151	264	0	201	682	1147	244	5509	0	44	5797	13775
% Car	0	0	0	100	100	0	96.6	95.1	100	96.6	96.7	0	88.2	100	97	89.1	95.7	0	100	95.4	96.3

FRA Engineering
530 Summit Point Drive
Henrietta, NY 14467

File Name : Med. Dentistry Driveway
 Site Code : 00000000
 Start Date : 12/18/2007
 Page No : 2

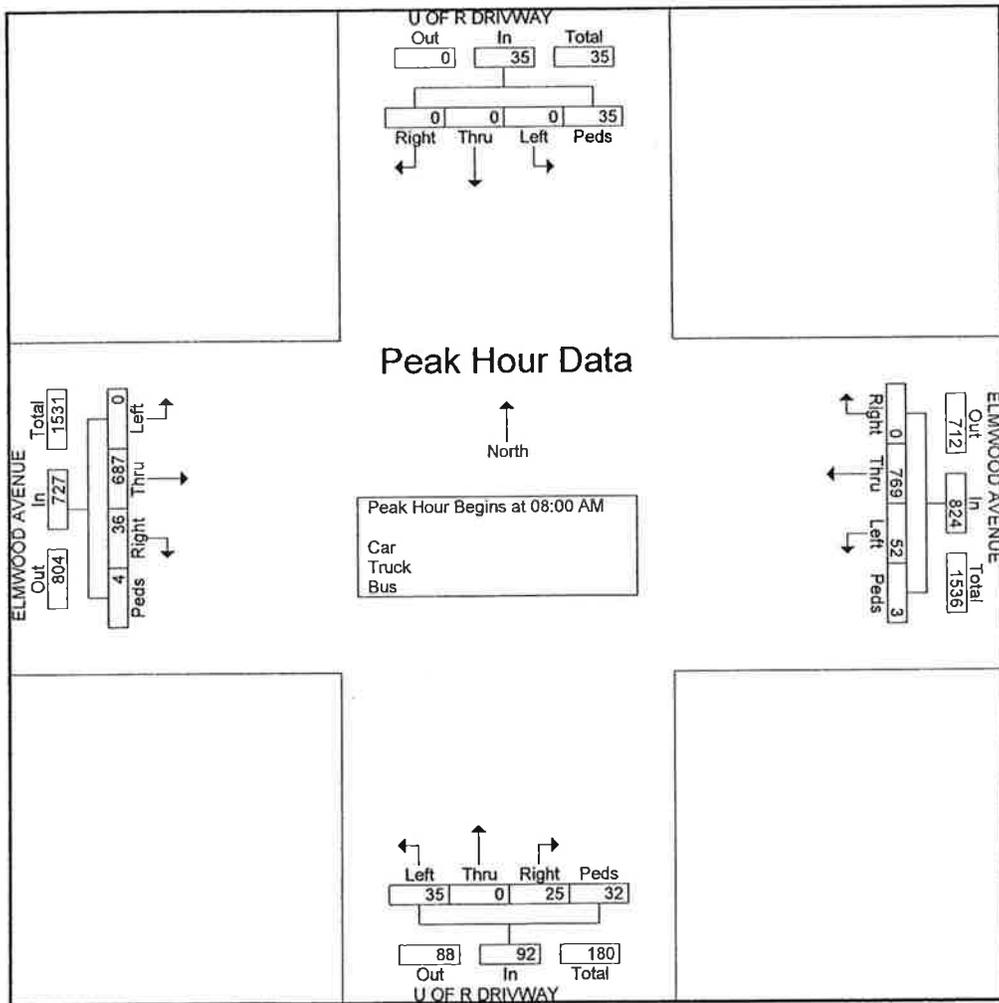
Groups Printed- Car - Truck - Bus

	U OF R DRIVWAY From North					ELMWOOD AVENUE From East					U OF R DRIVWAY From South					ELMWOOD AVENUE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Truck	0	0	0	0	0	0	96	11	0	107	5	0	7	0	12	9	94	0	0	103	222
% Truck	0	0	0	0	0	0	1.6	3.8	0	1.7	1.8	0	3.1	0	1	3.3	1.6	0	0	1.7	1.6
Bus	0	0	0	0	0	0	108	3	0	111	4	0	20	0	24	21	156	0	0	177	312
% Bus	0	0	0	0	0	0	1.8	1	0	1.7	1.5	0	8.8	0	2	7.7	2.7	0	0	2.9	2.2

FRA Engineering
530 Summit Point Drive
Henrietta, NY 14467

File Name : Med. Dentistry Driveway
 Site Code : 00000000
 Start Date : 12/18/2007
 Page No : 3

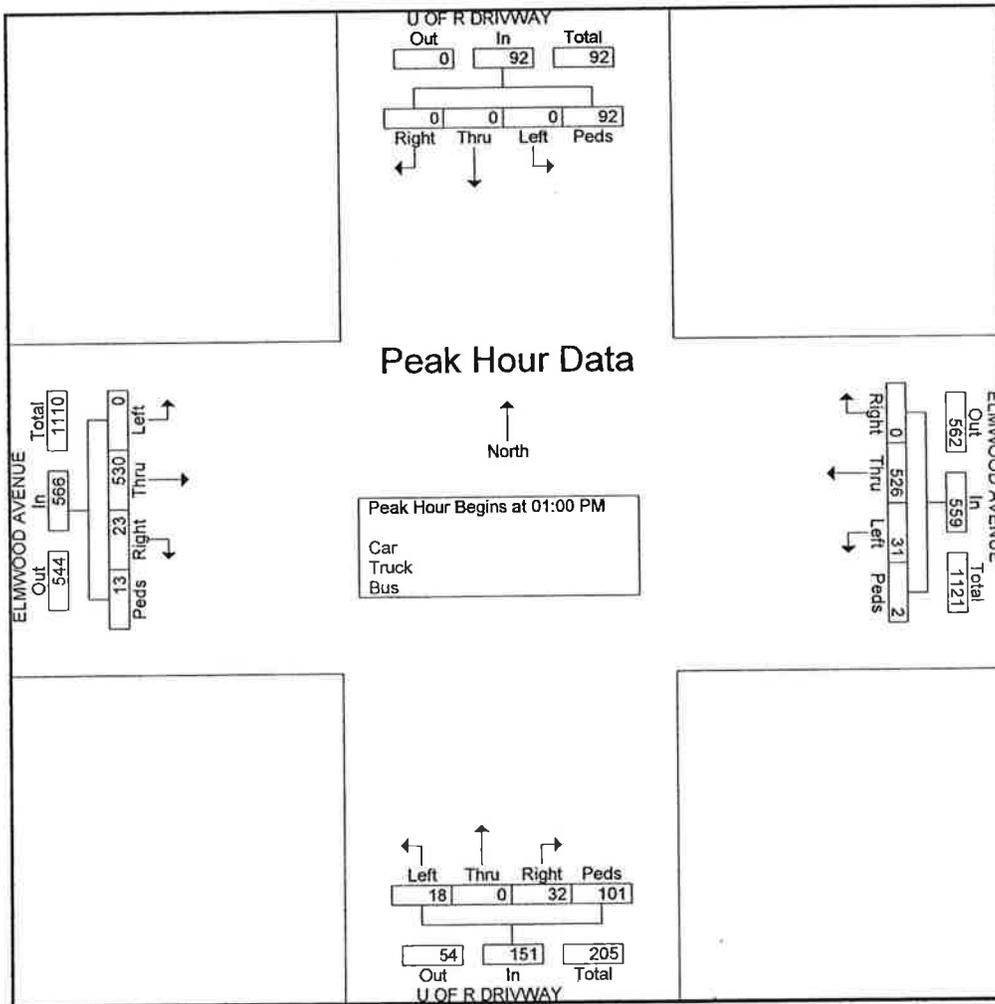
Start Time	U OF R DRIVWAY From North					ELMWOOD AVENUE From East					U OF R DRIVWAY From South					ELMWOOD AVENUE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	10	10	0	208	14	2	224	7	0	11	8	26	7	191	0	1	199	459
08:15 AM	0	0	0	8	8	0	199	12	0	211	4	0	9	9	22	7	169	0	3	179	420
08:30 AM	0	0	0	3	3	0	160	10	0	170	5	0	6	4	15	8	150	0	0	158	346
08:45 AM	0	0	0	14	14	0	202	16	1	219	9	0	9	11	29	14	177	0	0	191	453
Total Volume	0	0	0	35	35	0	769	52	3	824	25	0	35	32	92	36	687	0	4	727	1678
% App. Total																					
PHF	.000	.000	.000	.625	.625	.000	.924	.813	.375	.920	.694	.000	.795	.727	.793	.643	.899	.000	.333	.913	.914



FRA Engineering
530 Summit Point Drive
Henrietta, NY 14467

File Name : Med. Dentistry Driveway
 Site Code : 00000000
 Start Date : 12/18/2007
 Page No : 4

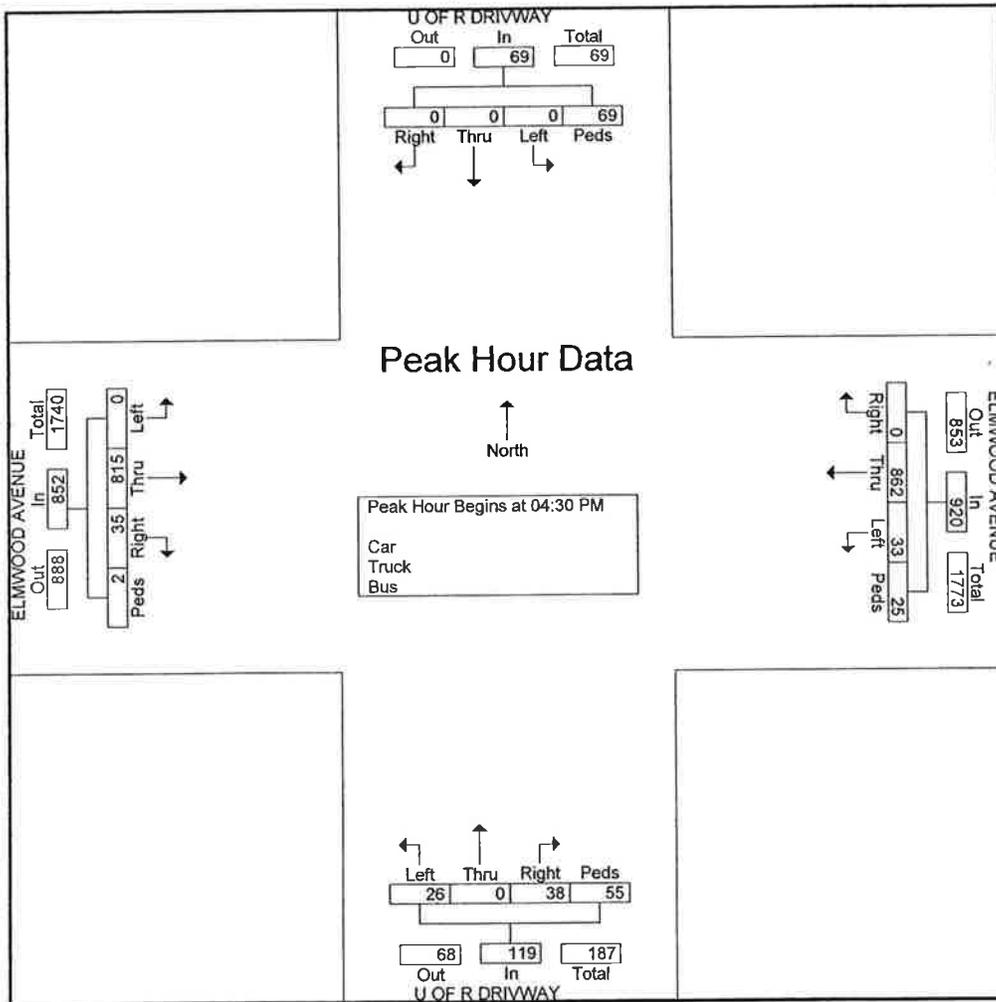
Start Time	U OF R DRIVWAY From North					ELMWOOD AVENUE From East					U OF R DRIVWAY From South					ELMWOOD AVENUE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	0	0	0	17	17	0	132	6	1	139	7	0	1	23	31	6	122	0	4	132	319
01:15 PM	0	0	0	19	19	0	119	8	0	127	9	0	1	20	30	5	109	0	4	118	294
01:30 PM	0	0	0	16	16	0	148	10	1	159	9	0	9	30	48	9	130	0	2	141	364
01:45 PM	0	0	0	40	40	0	127	7	0	134	7	0	7	28	42	3	169	0	3	175	391
Total Volume	0	0	0	92	92	0	526	31	2	559	32	0	18	101	151	23	530	0	13	566	1368
% App. Total																					
PHF	.000	.000	.000	.575	.575	.000	.889	.775	.500	.879	.889	.000	.500	.842	.786	.639	.784	.000	.813	.809	.875



FRA Engineering
530 Summit Point Drive
Henrietta, NY 14467

File Name : Med. Dentistry Driveway
 Site Code : 00000000
 Start Date : 12/18/2007
 Page No : 5

Start Time	U OF R DRIVWAY From North					ELMWOOD AVENUE From East					U OF R DRIVWAY From South					ELMWOOD AVENUE From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	25	25	0	246	6	7	259	4	0	7	10	21	10	223	0	0	233	538
04:45 PM	0	0	0	25	25	0	204	10	6	220	9	0	3	12	24	9	189	0	0	198	467
05:00 PM	0	0	0	12	12	0	229	6	9	244	12	0	7	18	37	4	218	0	1	223	516
05:15 PM	0	0	0	7	7	0	183	11	3	197	13	0	9	15	37	12	185	0	1	198	439
Total Volume	0	0	0	69	69	0	862	33	25	920	38	0	26	55	119	35	815	0	2	852	1960
% App. Total																					
PHF	.000	.000	.000	.690	.690	.000	.876	.750	.694	.888	.731	.000	.722	.764	.804	.729	.914	.000	.500	.914	.911

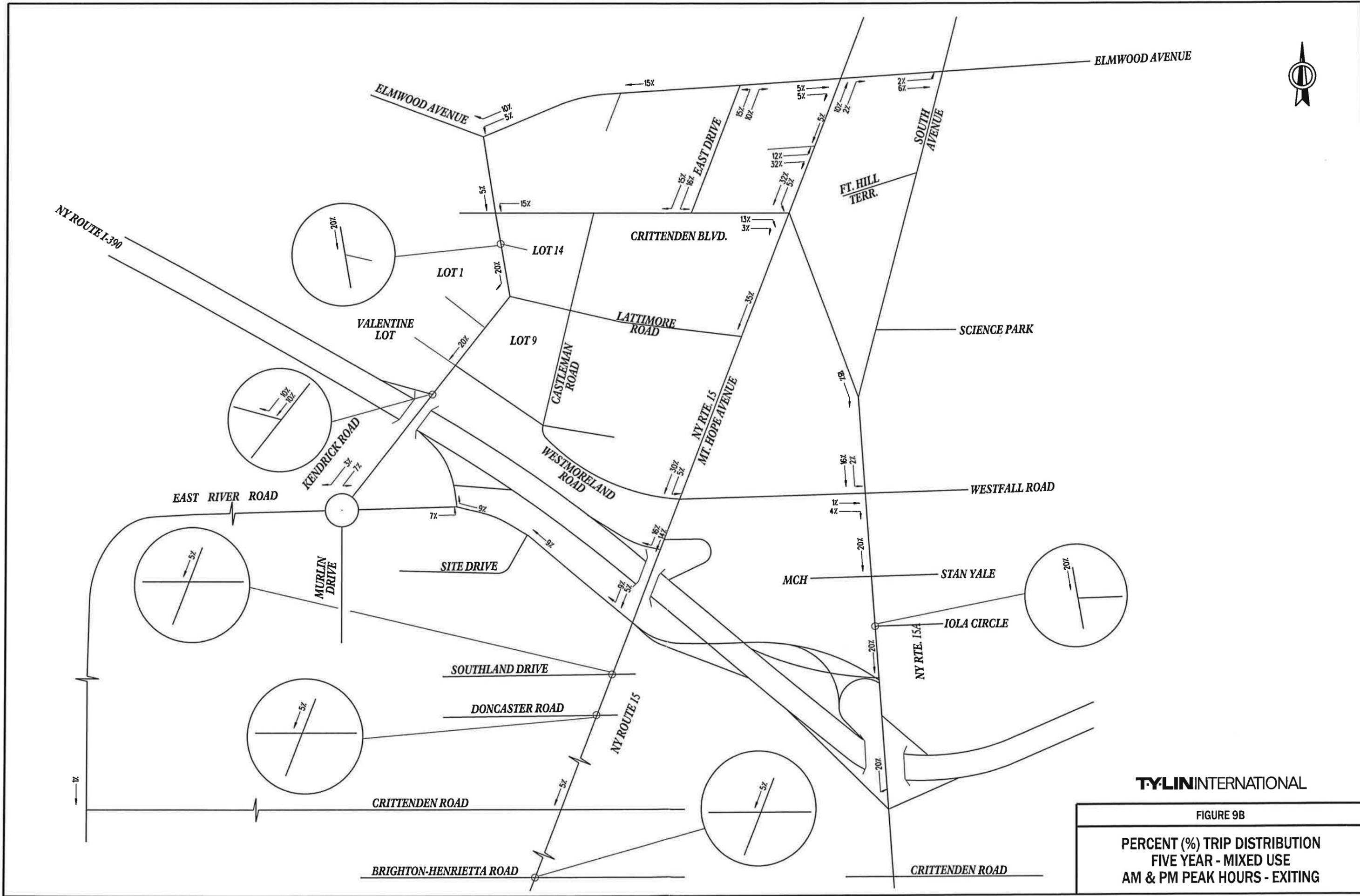


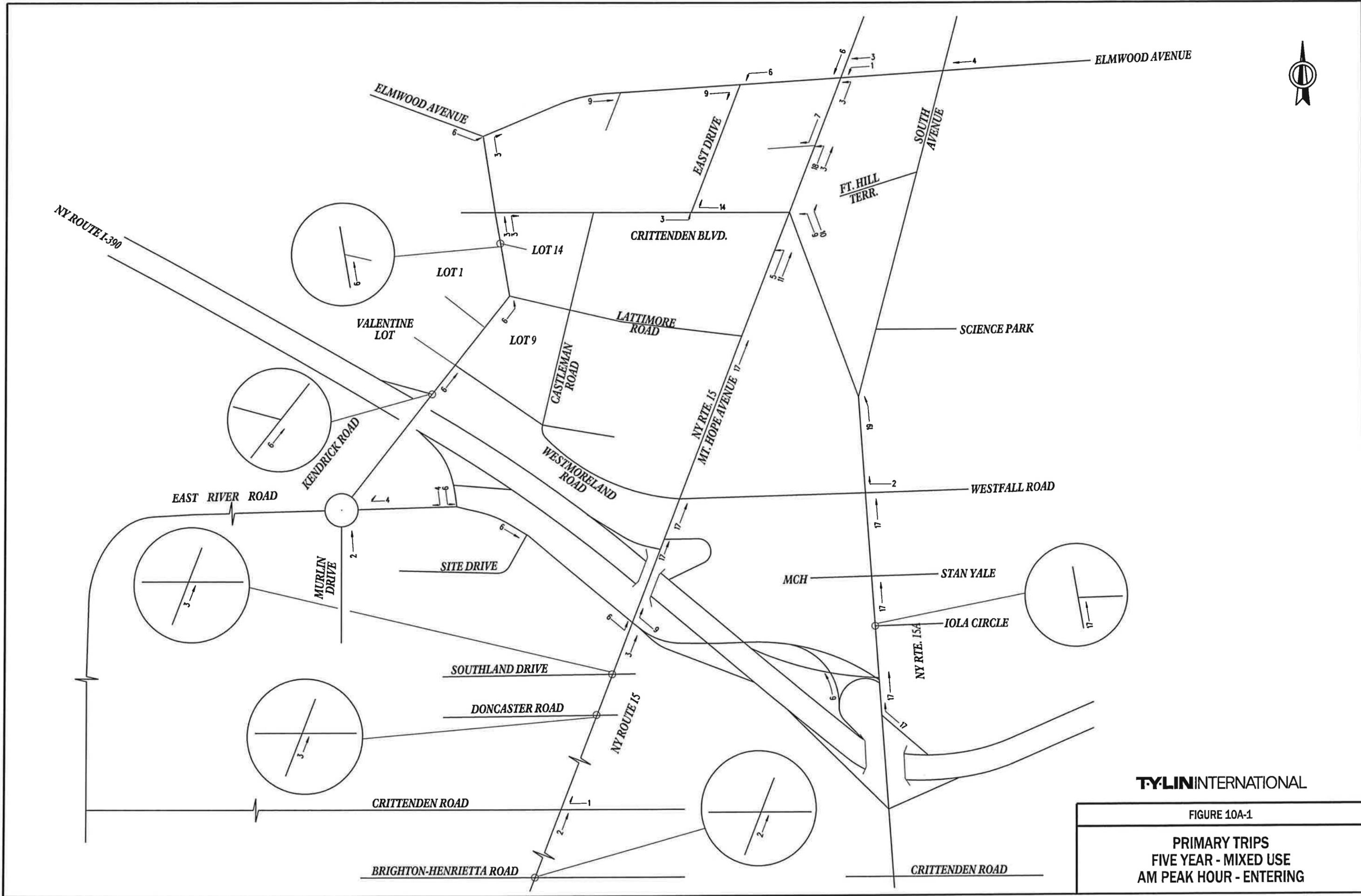
APPENDIX 'H'

Traffic Volume Figures

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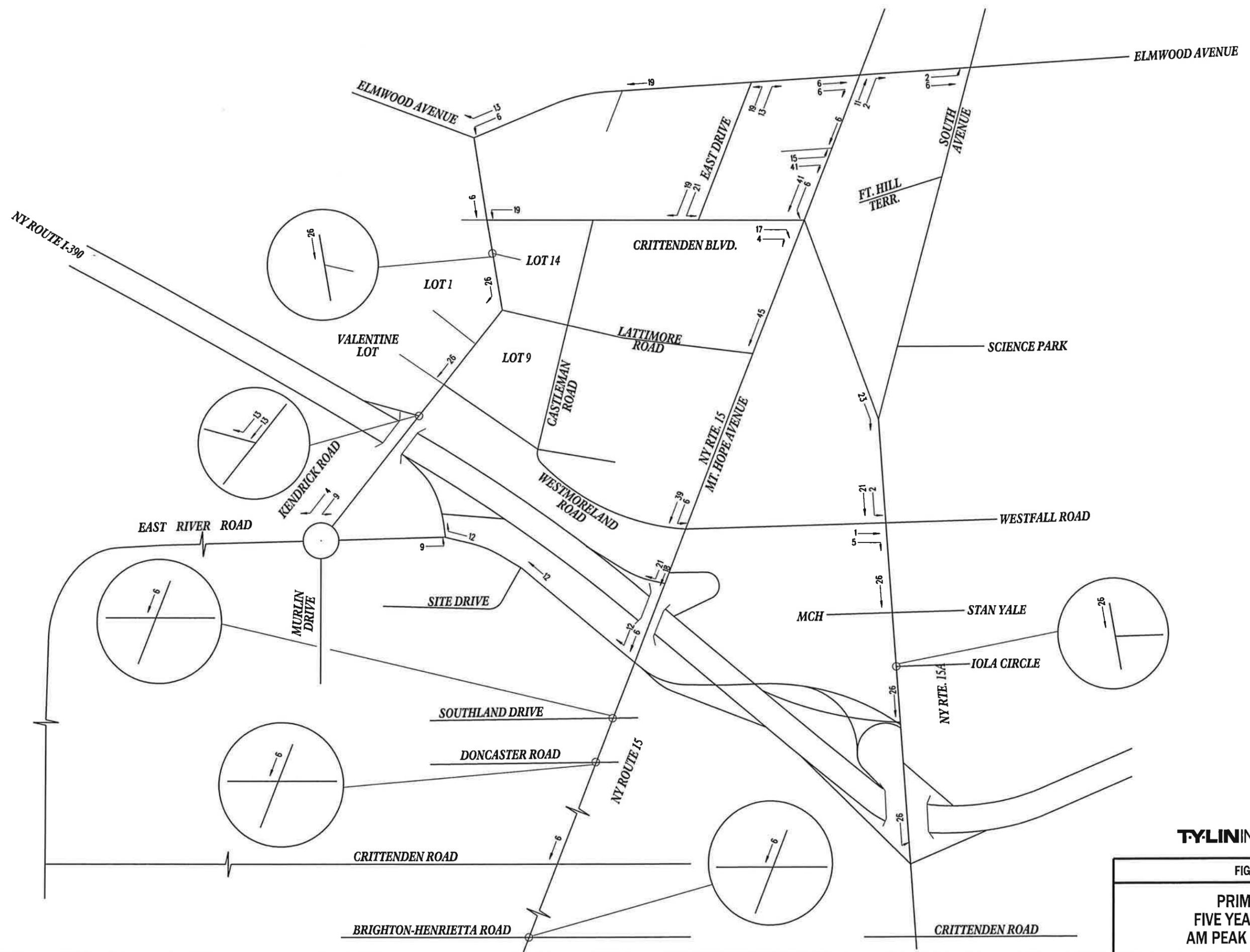




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FIGURE 10A-1

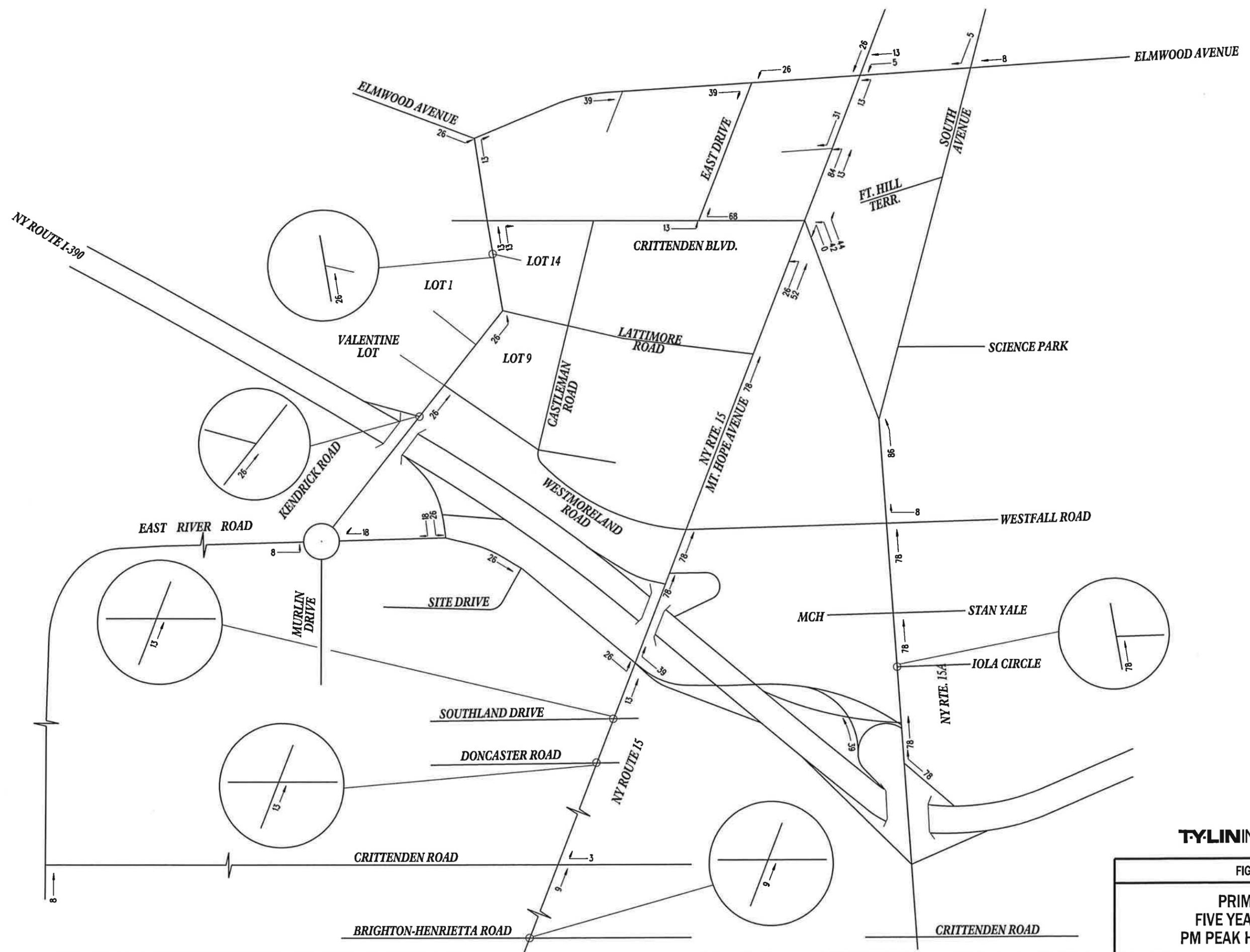
PRIMARY TRIPS
FIVE YEAR - MIXED USE
AM PEAK HOUR - ENTERING



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FIGURE 10A-2

PRIMARY TRIPS
FIVE YEAR - MIXED USE
AM PEAK HOUR - EXITING



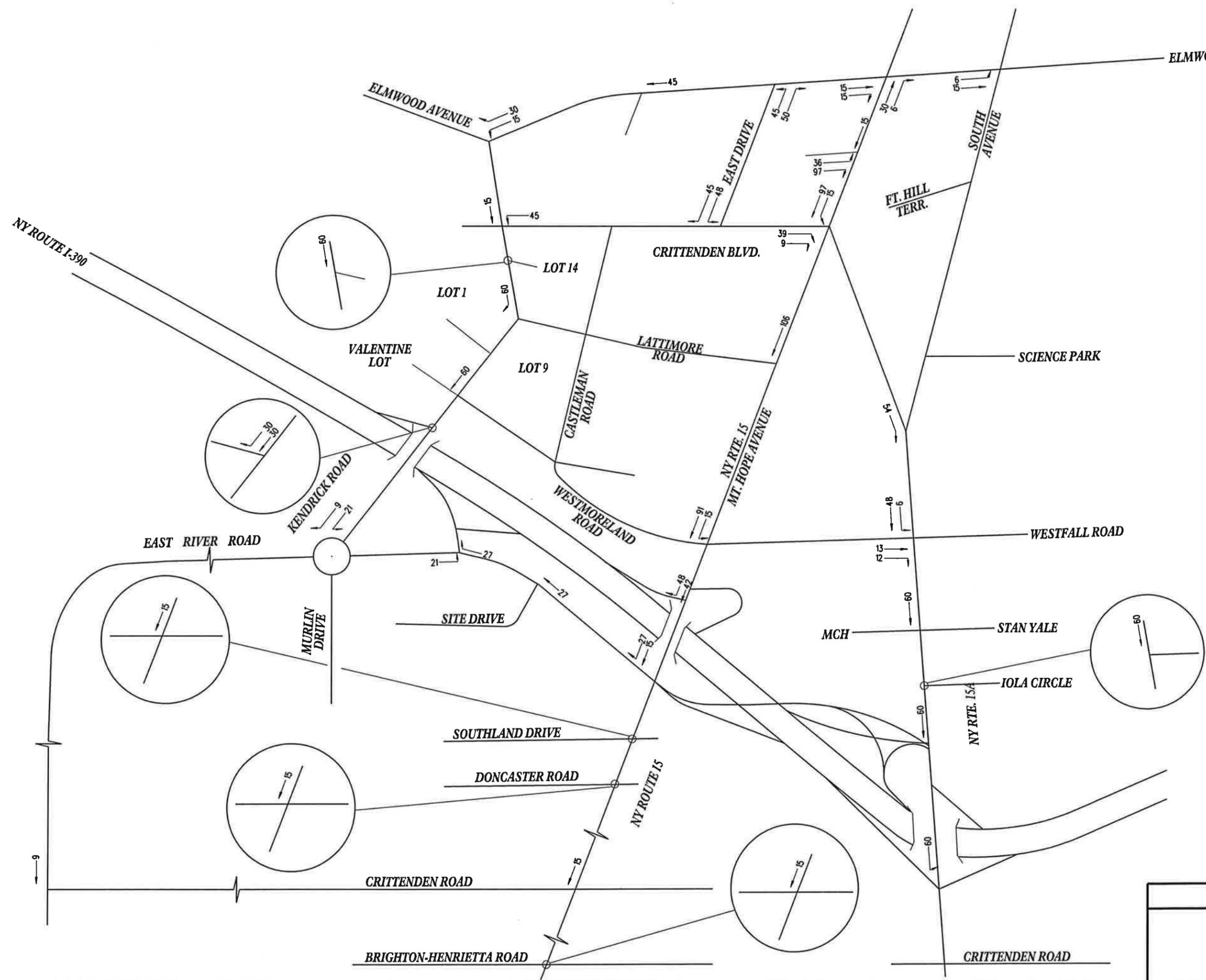
TYLIN INTERNATIONAL

FIGURE 10B-1

PRIMARY TRIPS
FIVE YEAR - MIXED USE
PM PEAK HOUR - ENTERING



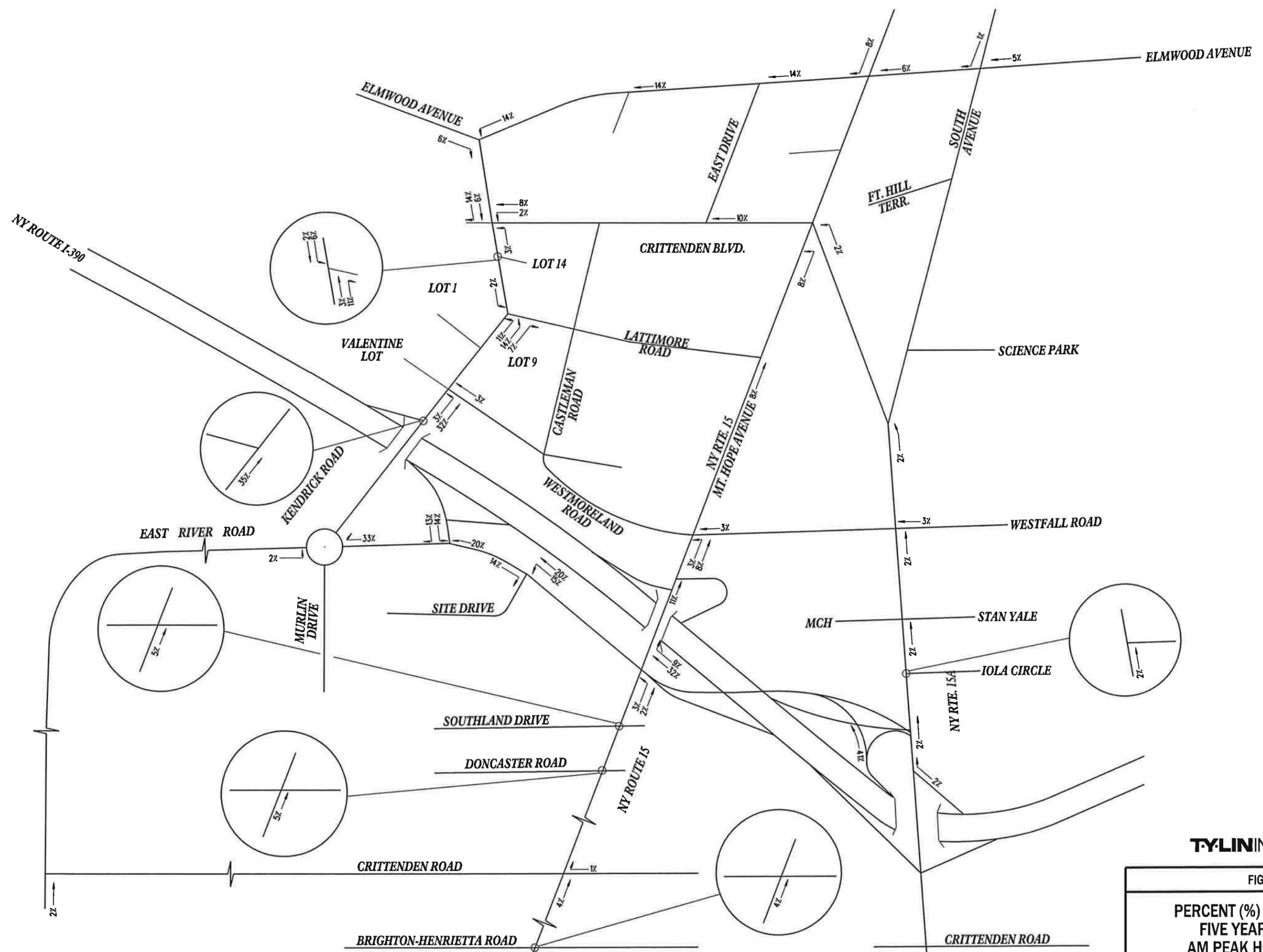
ELMWOOD AVENUE



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FIGURE 10B-2

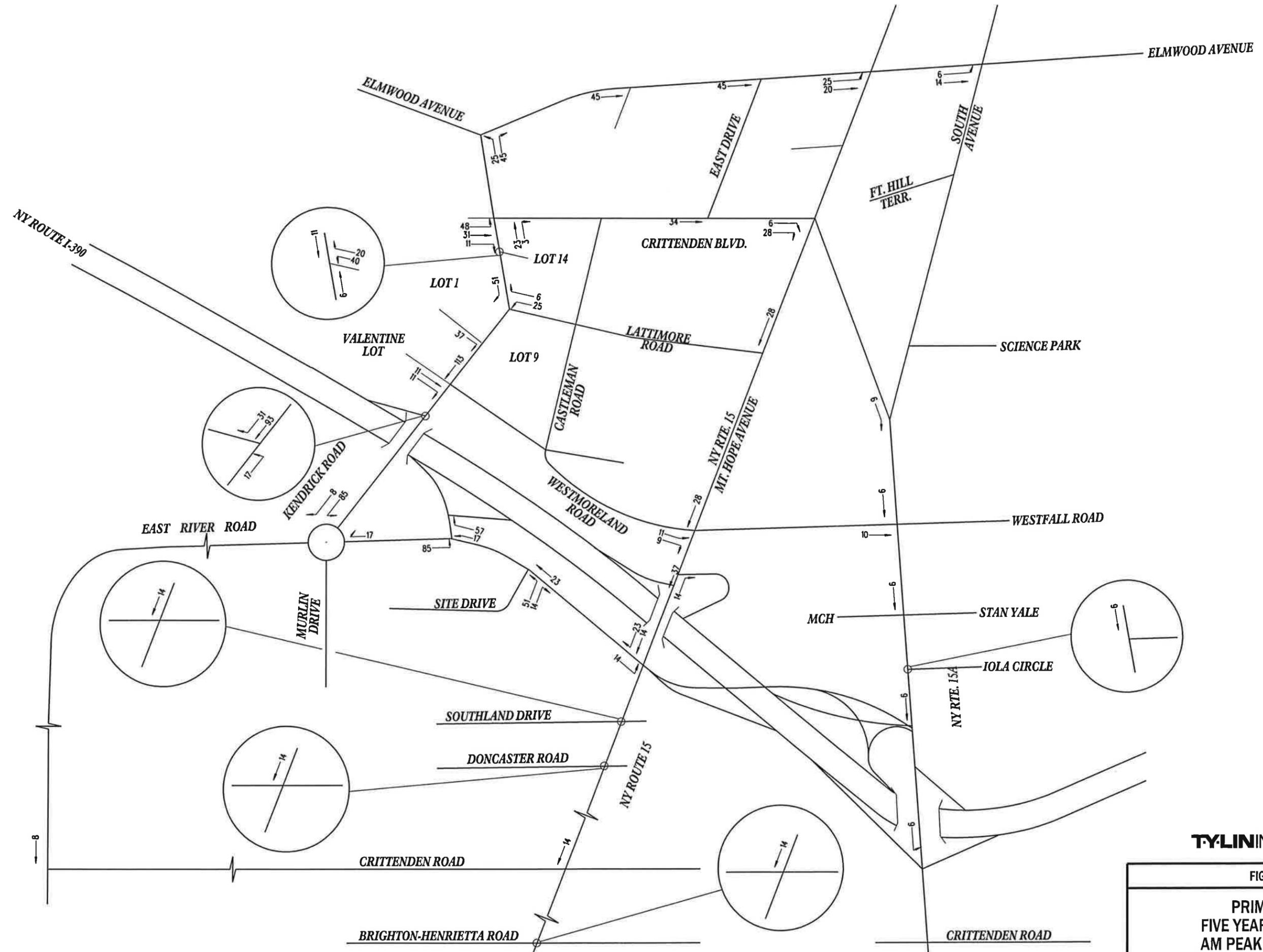
PRIMARY TRIPS
FIVE YEAR - MIXED USE
PM PEAK HOUR - EXITING



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FIGURE 11A-1

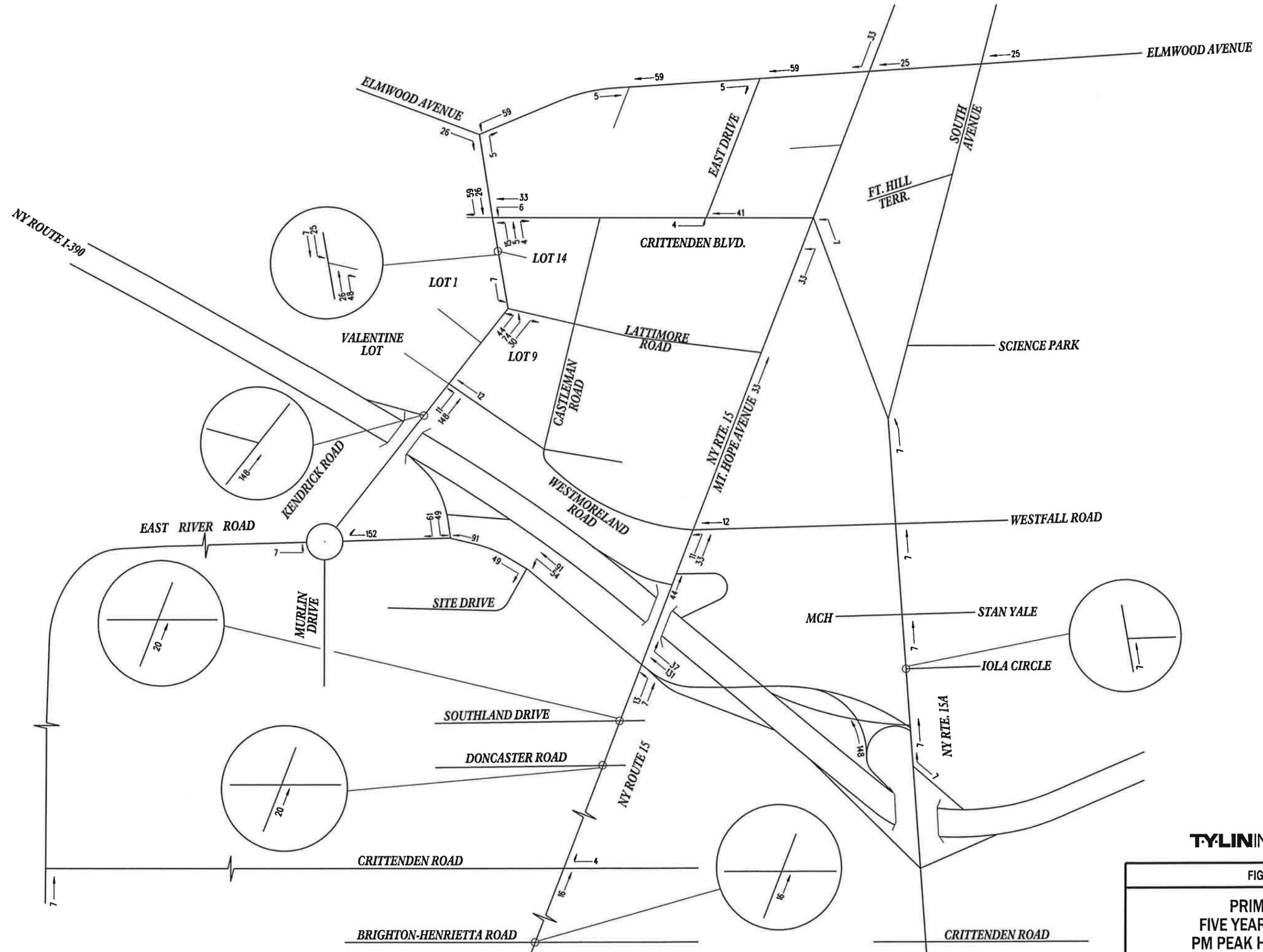
PERCENT (%) TRIP DISTRIBUTION
FIVE YEAR - MID CAMPUS
AM PEAK HOURS - ENTERING



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FIGURE 12A-2

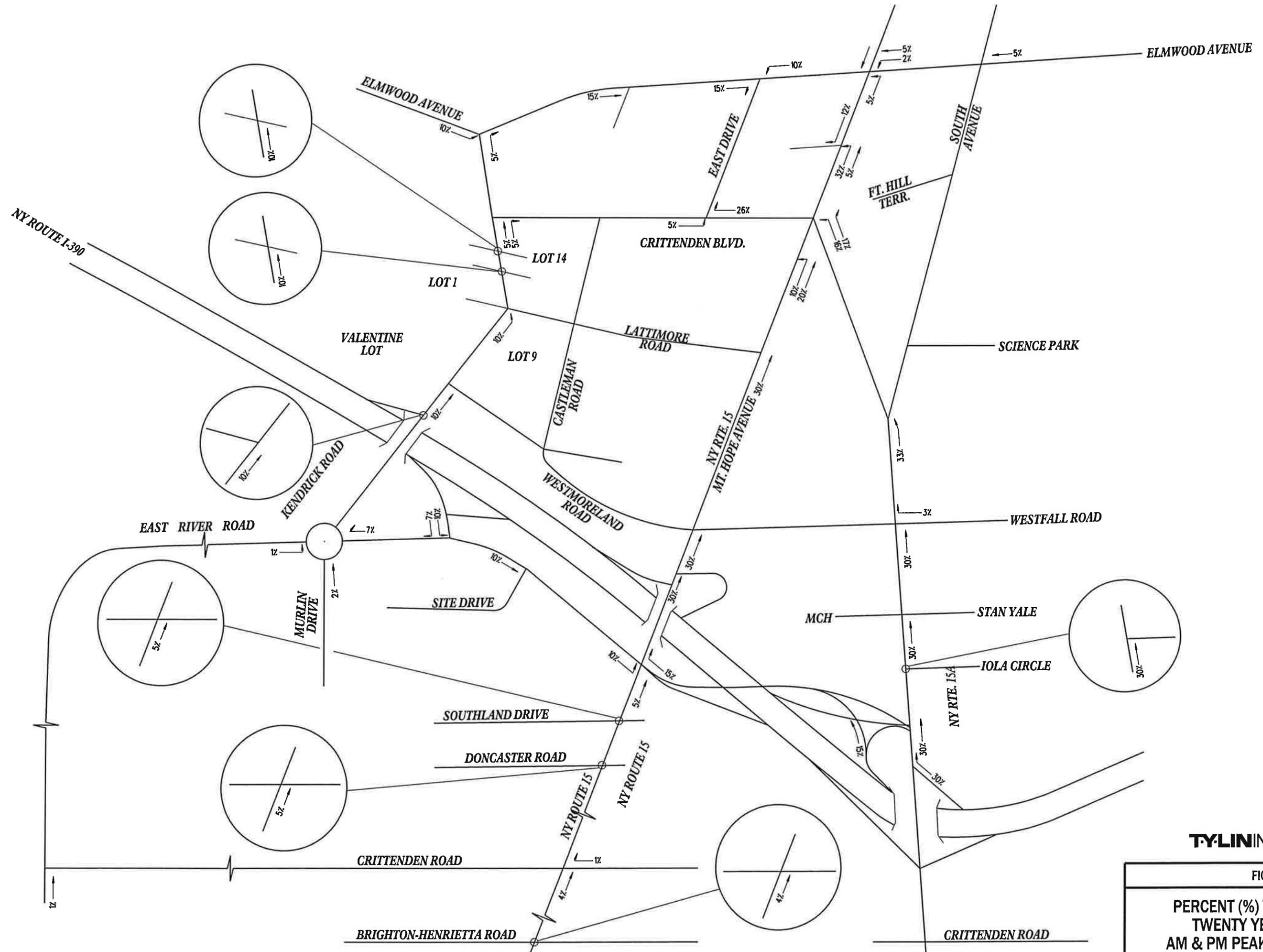
PRIMARY TRIPS
FIVE YEAR - MID CAMPUS
AM PEAK HOUR - EXITING



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FIGURE 12B-1

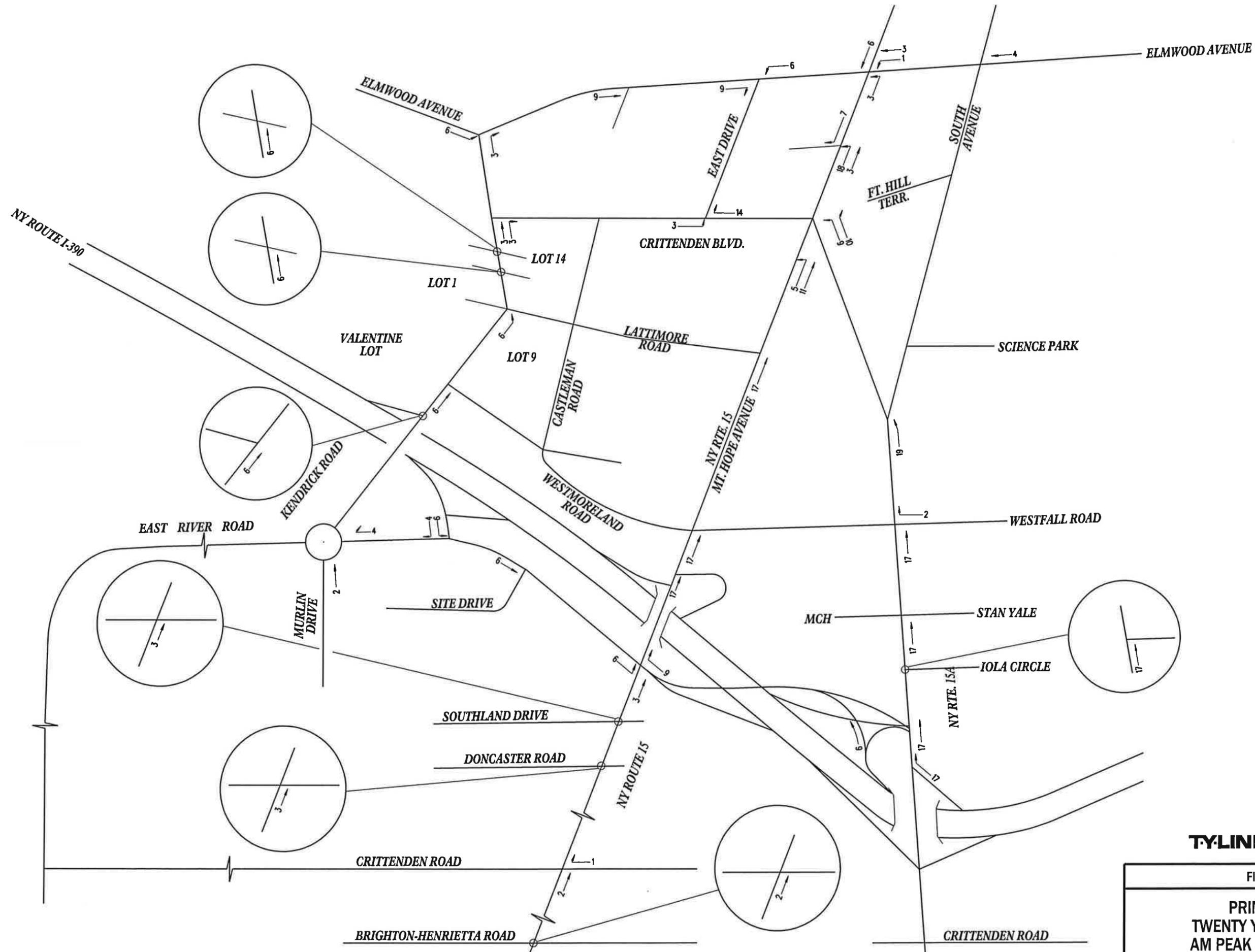
**PRIMARY TRIPS
FIVE YEAR - MID CAMPUS
PM PEAK HOUR - ENTERING**



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FIGURE 13A

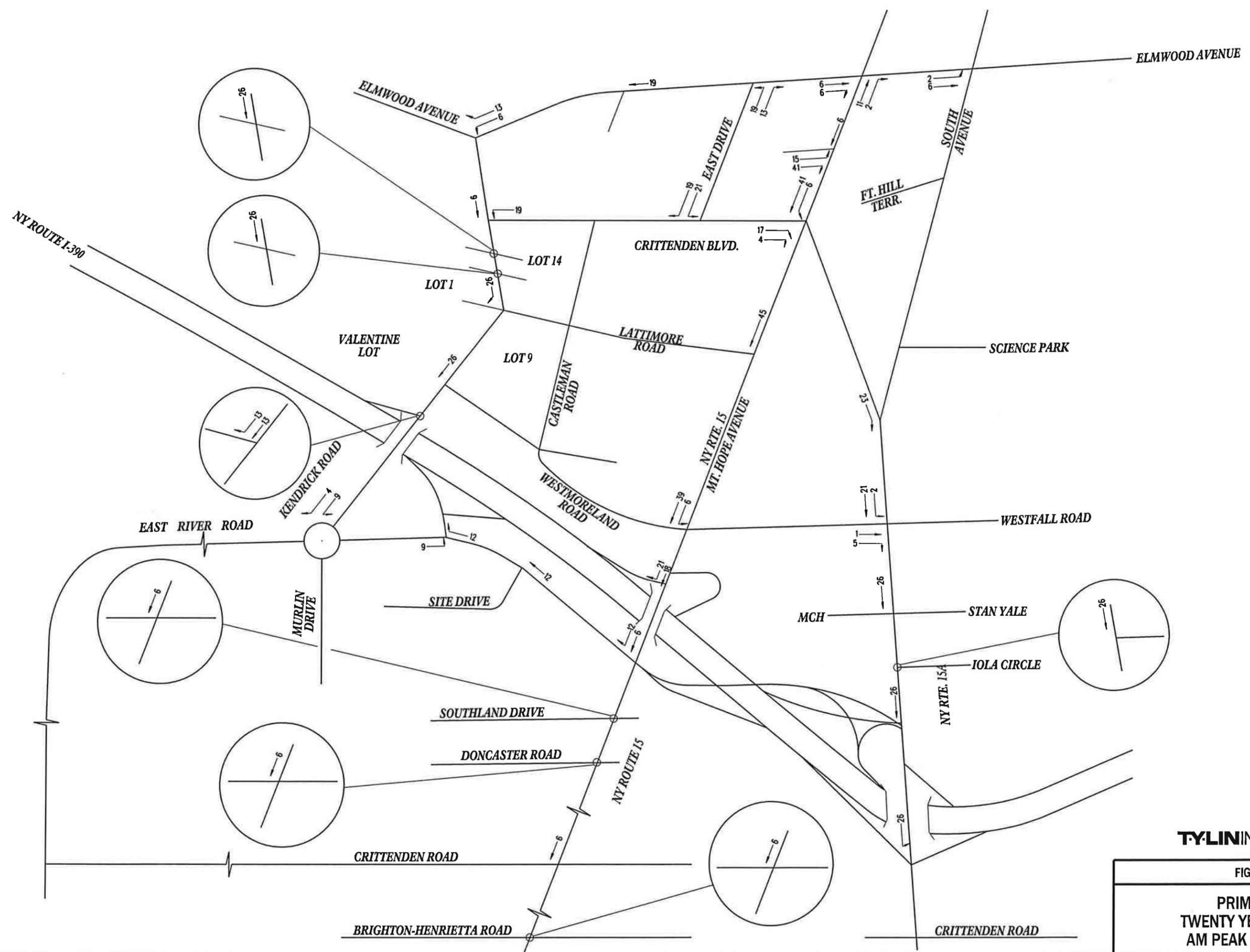
PERCENT (%) TRIP DISTRIBUTION
TWENTY YEAR - MIXED USE
AM & PM PEAK HOURS - ENTERING



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FIGURE 14A-1

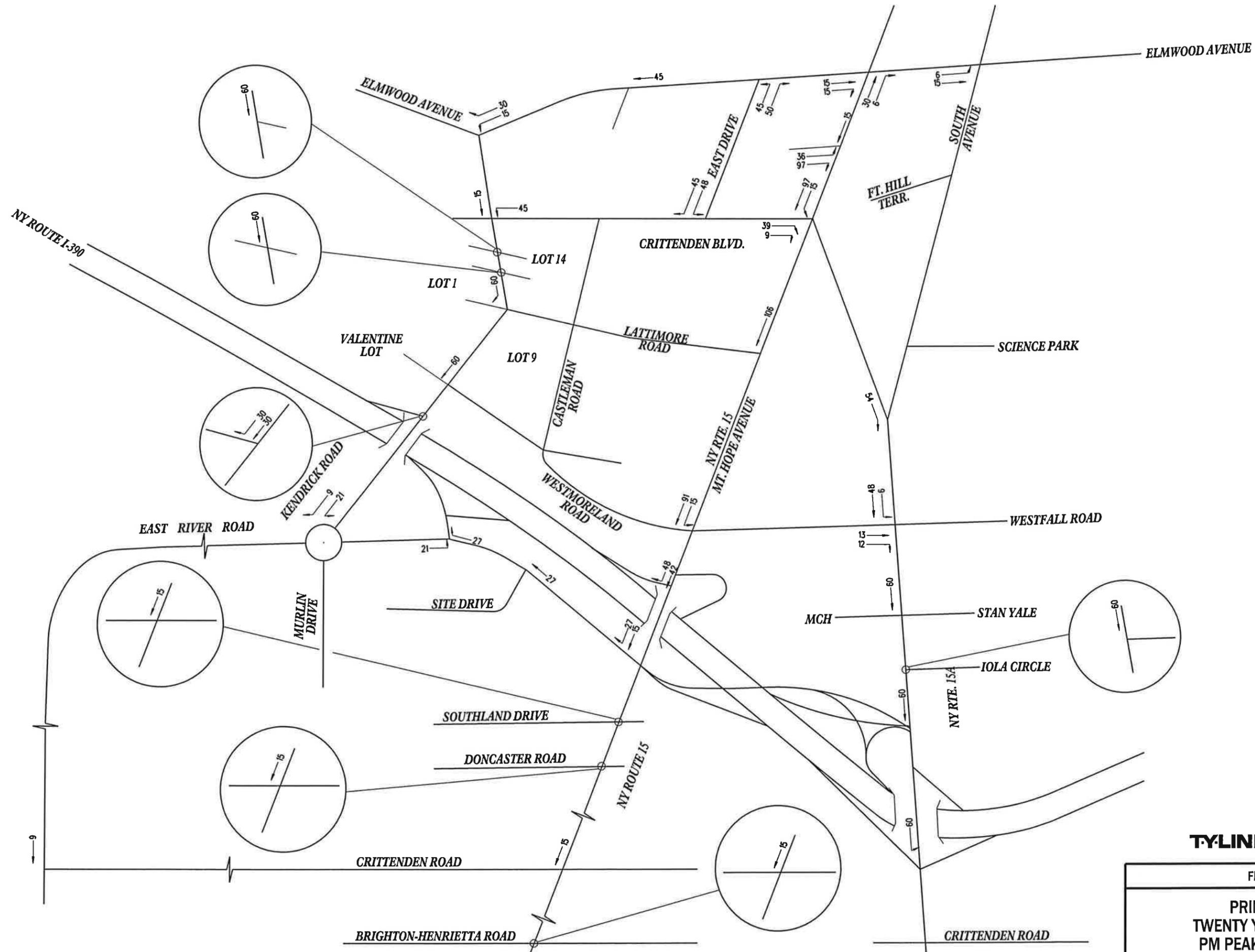
PRIMARY TRIPS
TWENTY YEAR - MIXED USE
AM PEAK HOUR - ENTERING



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FIGURE 14A-2

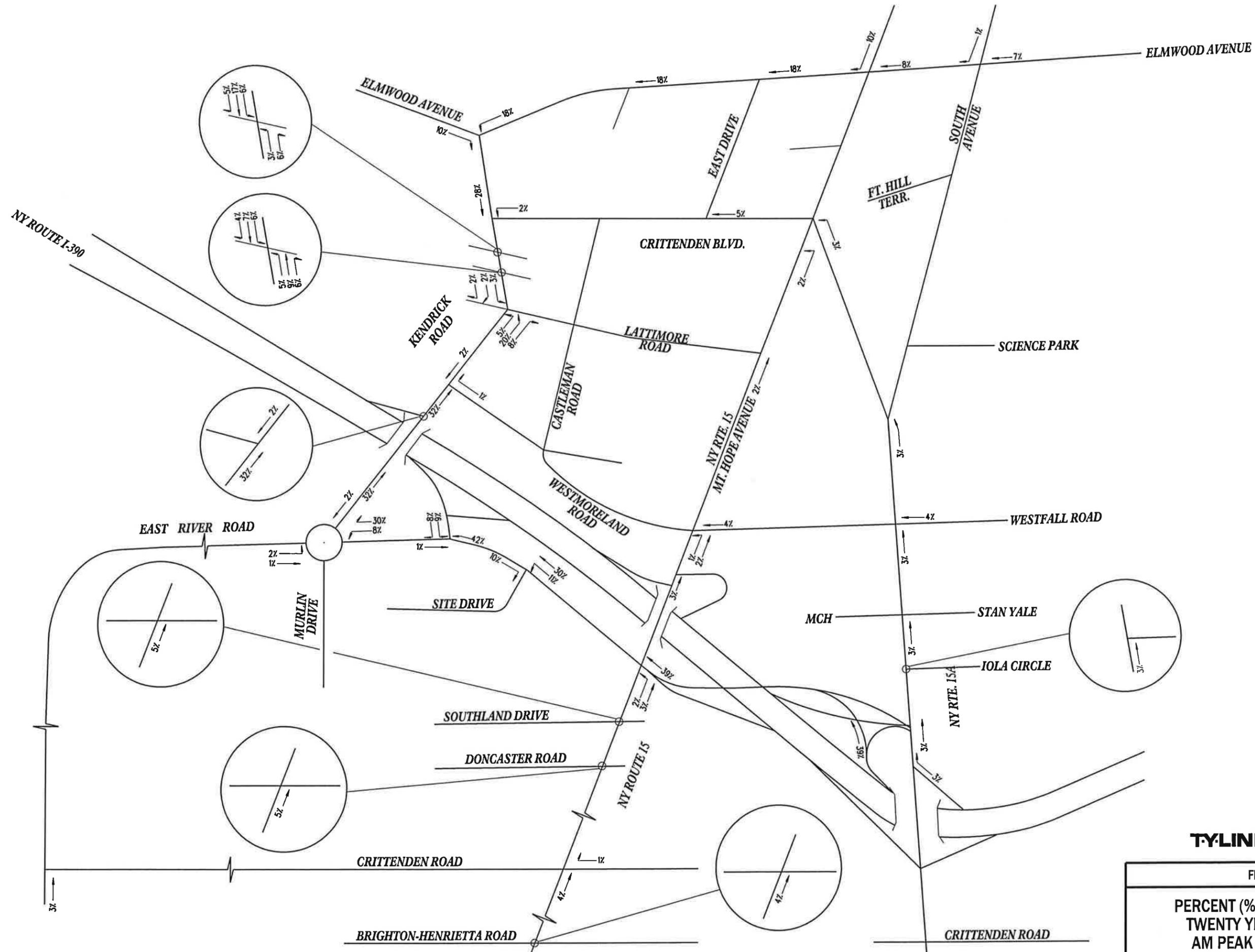
PRIMARY TRIPS
TWENTY YEAR - MIXED USE
AM PEAK HOUR - EXITING



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FIGURE 14B-2

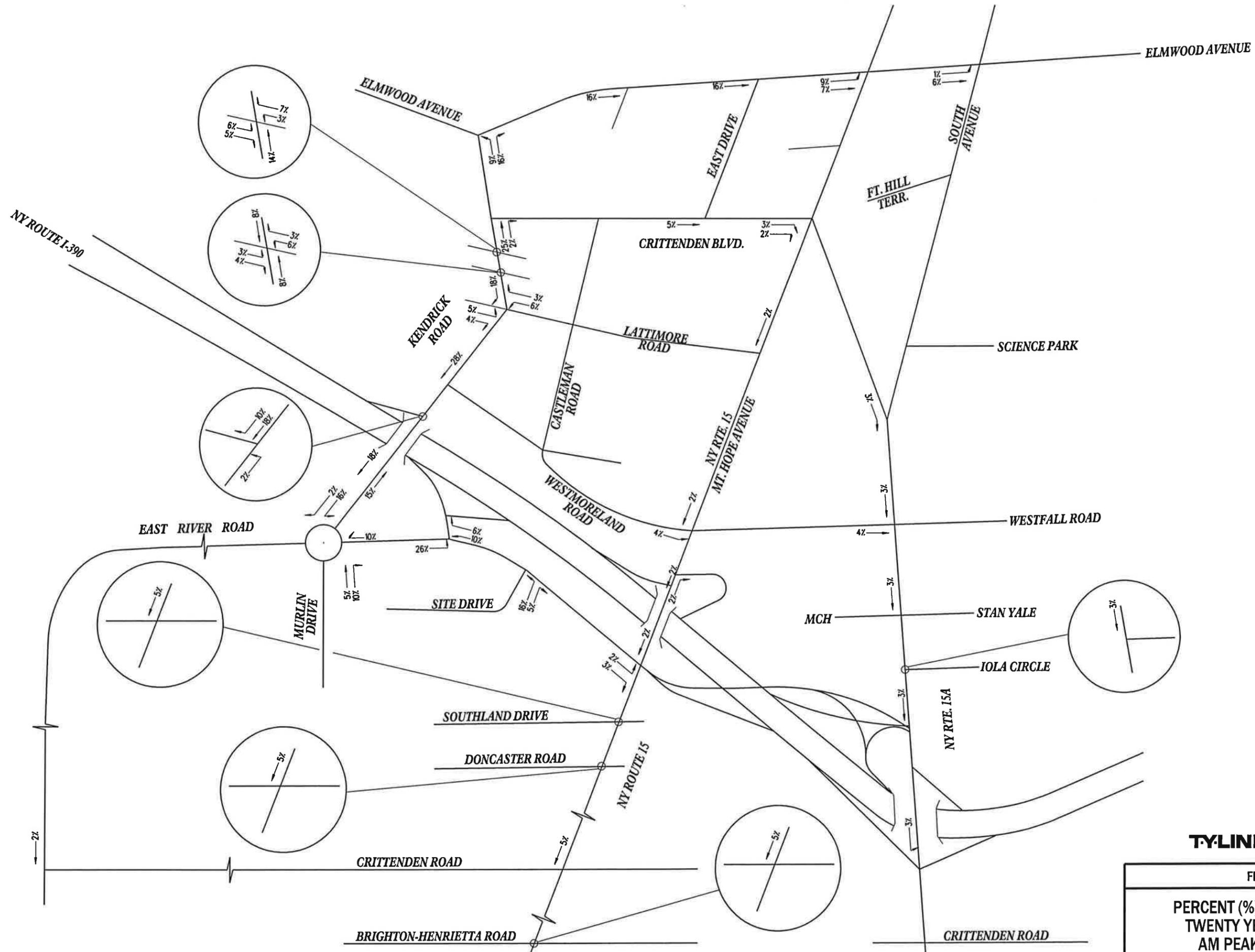
PRIMARY TRIPS
TWENTY YEAR - MIXED USE
PM PEAK HOUR - EXITING



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FIGURE 15A-1

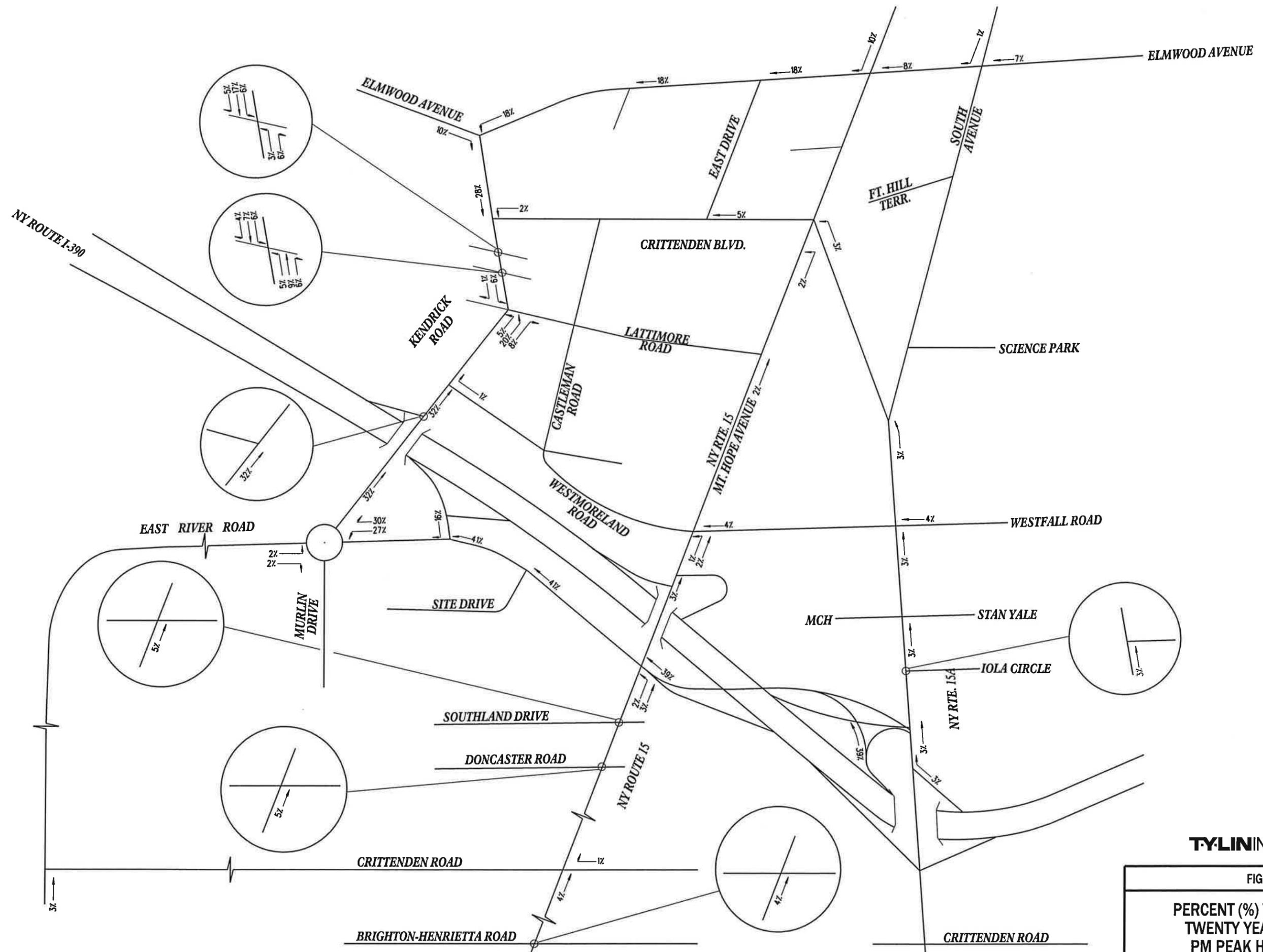
PERCENT (%) TRIP DISTRIBUTION
TWENTY YEAR - MID CAMPUS
AM PEAK HOUR - ENTERING



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FIGURE 15A-2

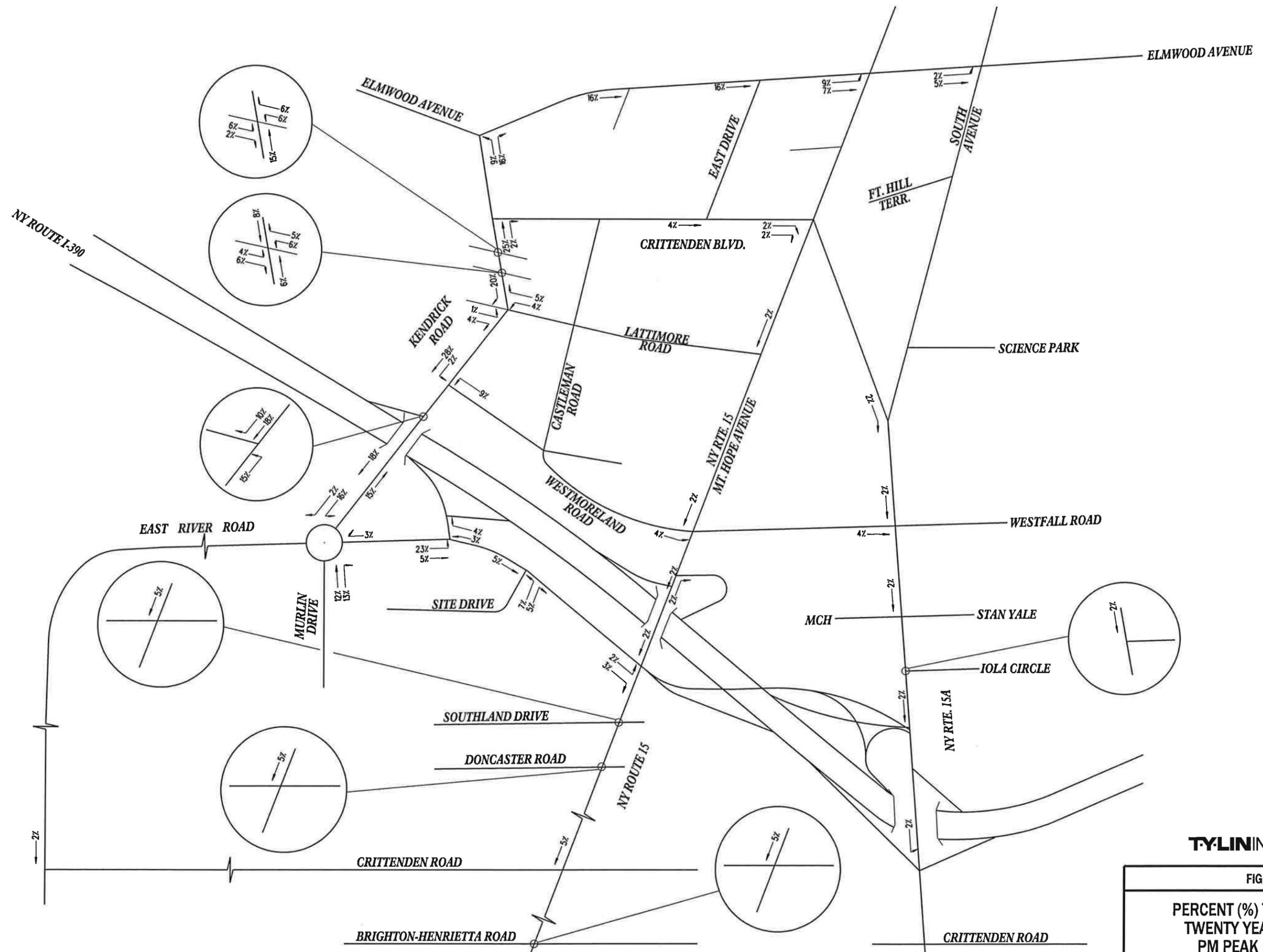
PERCENT (%) TRIP DISTRIBUTION
TWENTY YEAR - MID CAMPUS
AM PEAK HOUR - EXITING



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FIGURE 15B-1

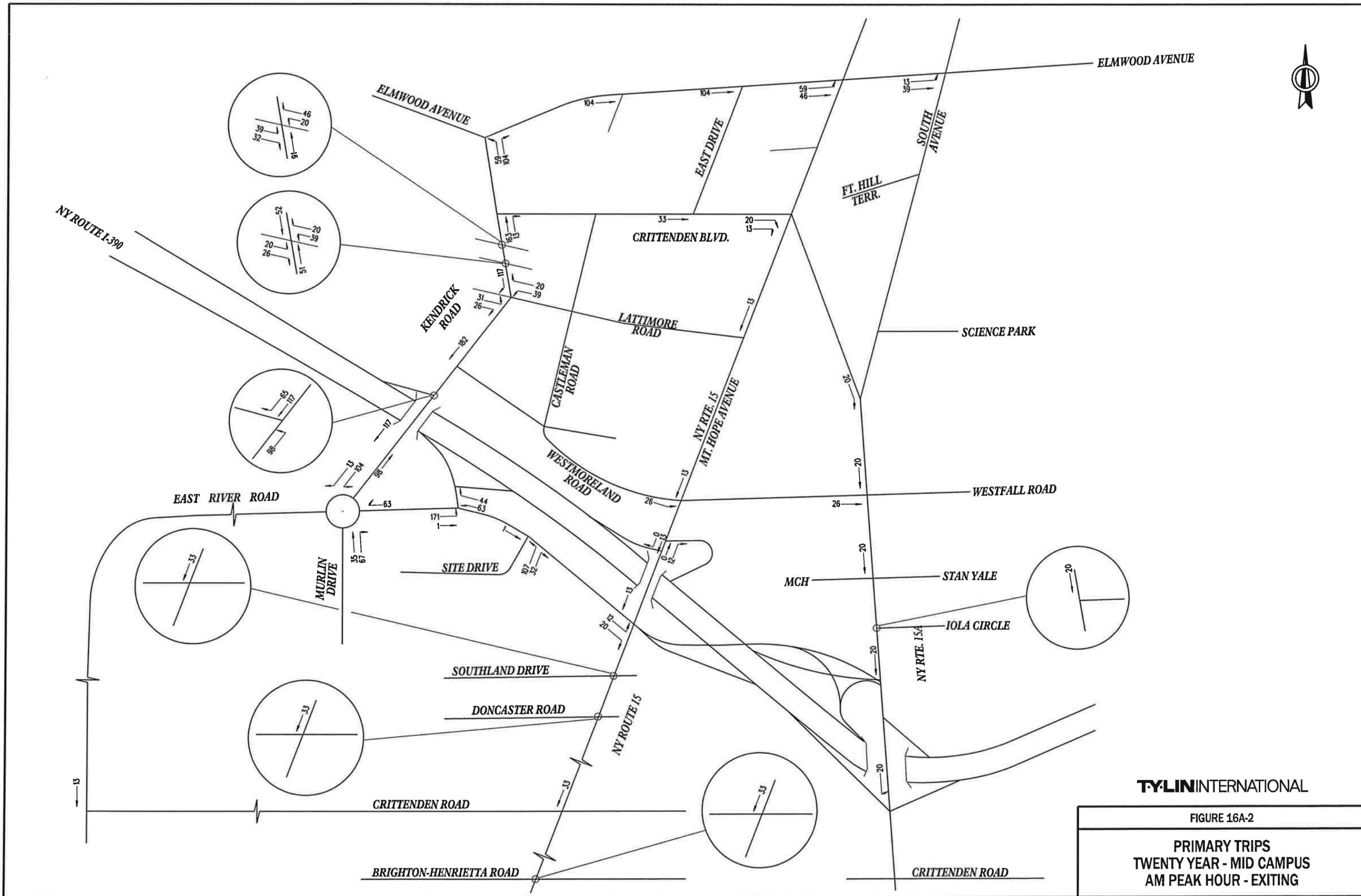
PERCENT (%) TRIP DISTRIBUTION
TWENTY YEAR - MID CAMPUS
PM PEAK HOUR - ENTERING



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FIGURE 15B-2

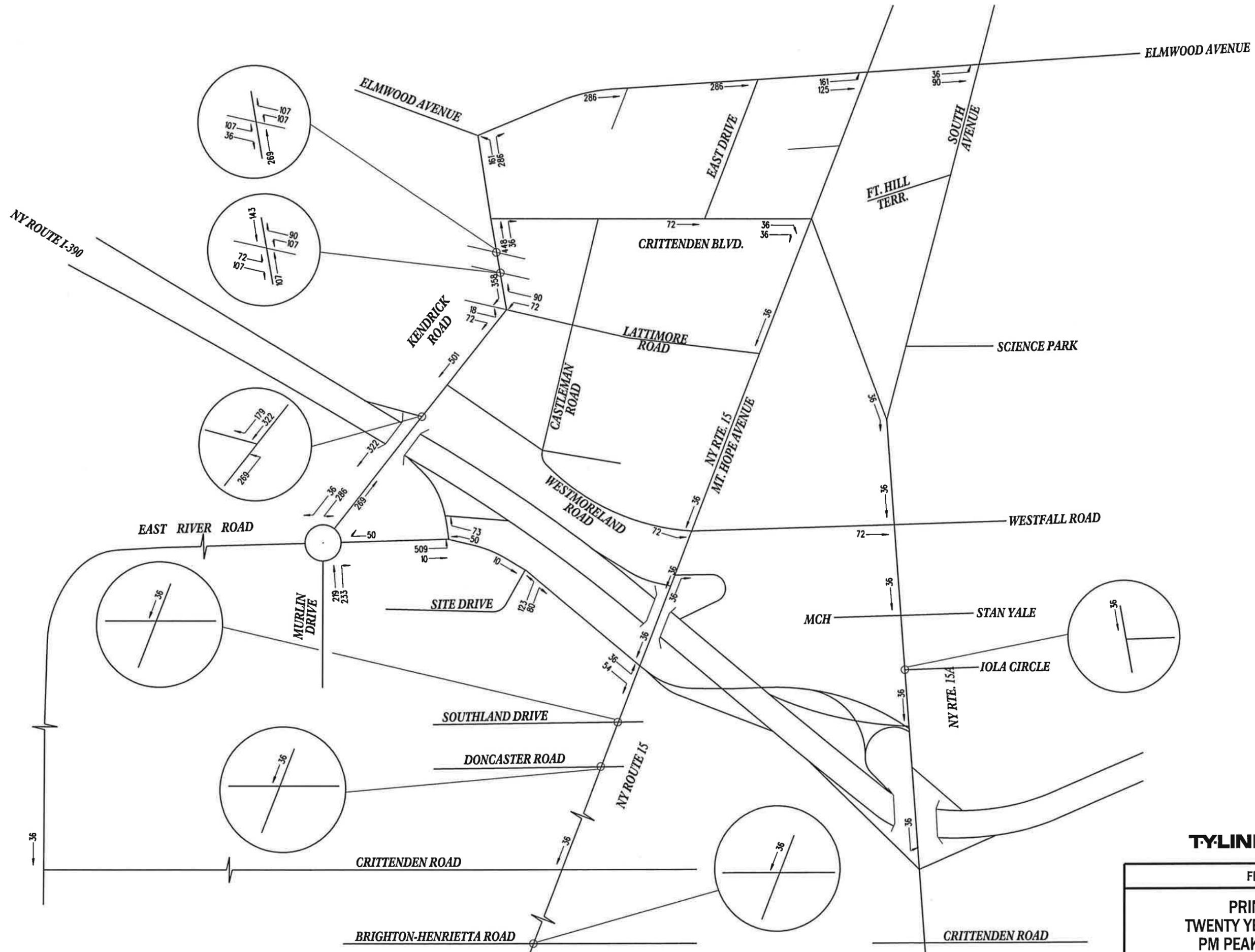
PERCENT (%) TRIP DISTRIBUTION
TWENTY YEAR - MID CAMPUS
PM PEAK HOUR - EXITING



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FIGURE 16A-2

PRIMARY TRIPS
TWENTY YEAR - MID CAMPUS
AM PEAK HOUR - EXITING



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FIGURE 16B-2

PRIMARY TRIPS
TWENTY YEAR - MID CAMPUS
PM PEAK HOUR - EXITING

APPENDIX 'I'

University of Rochester Parking Area Map

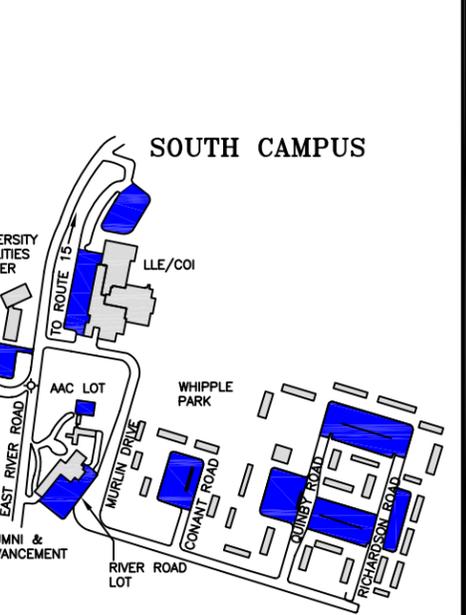
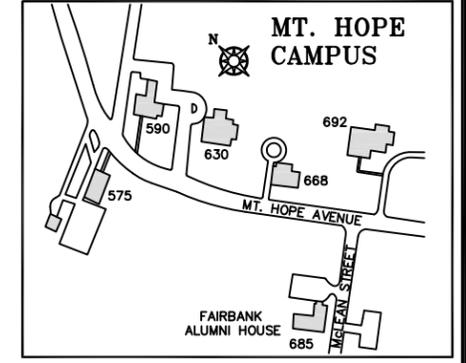
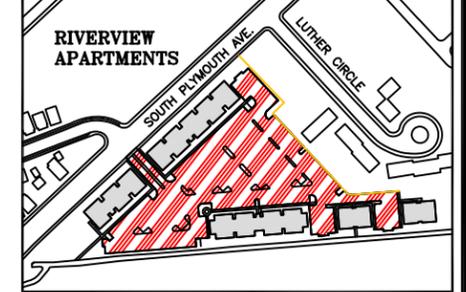
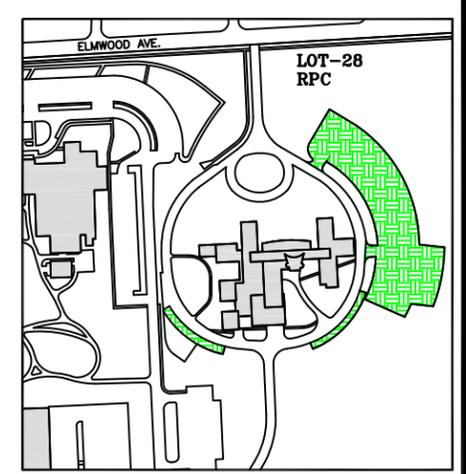
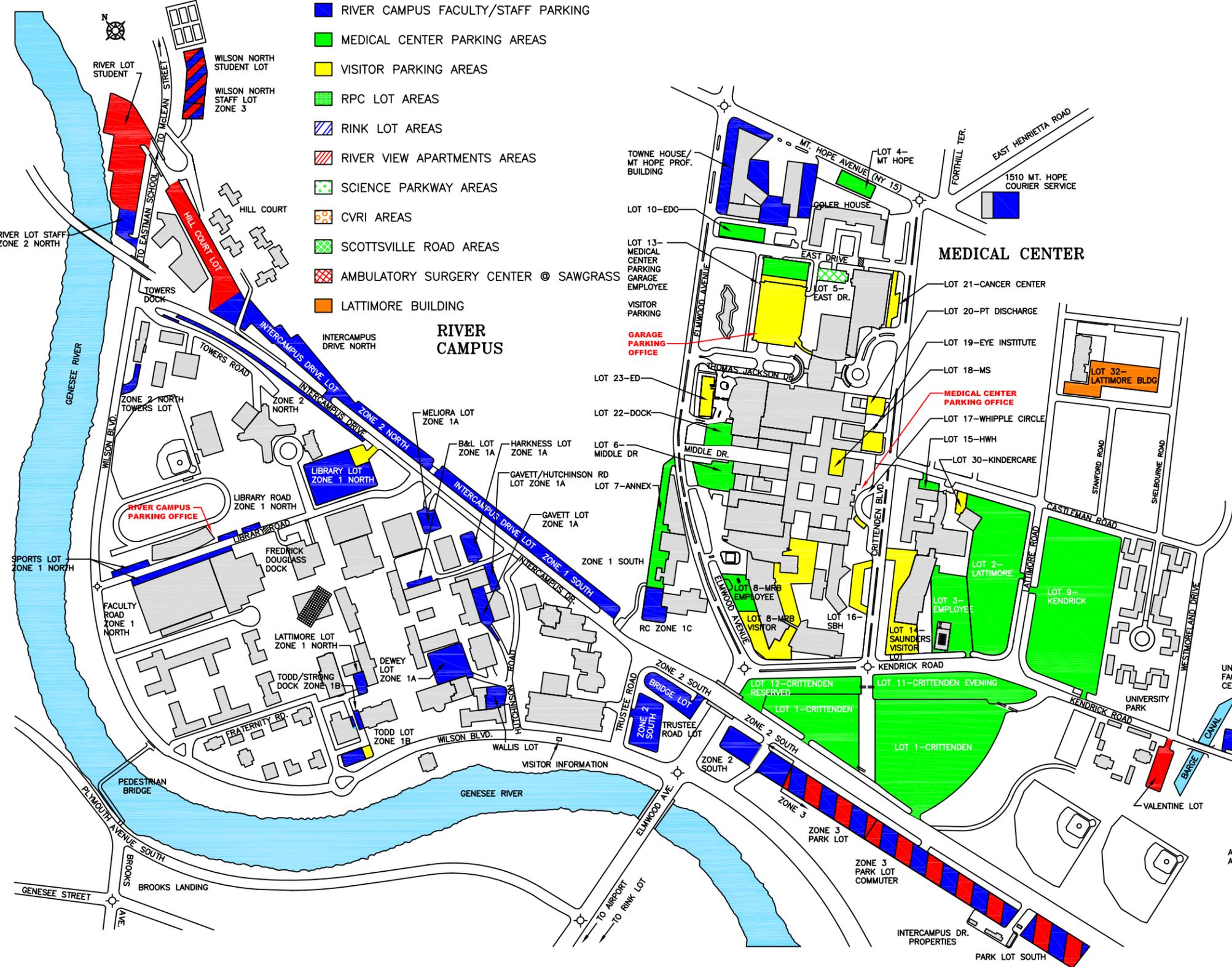
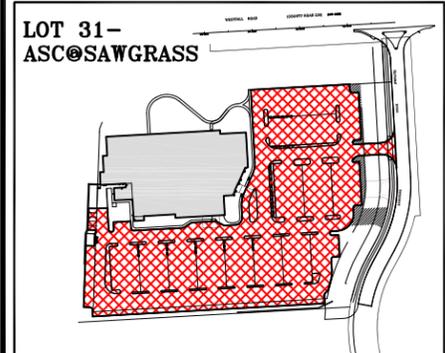
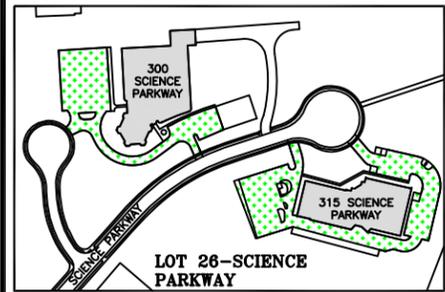
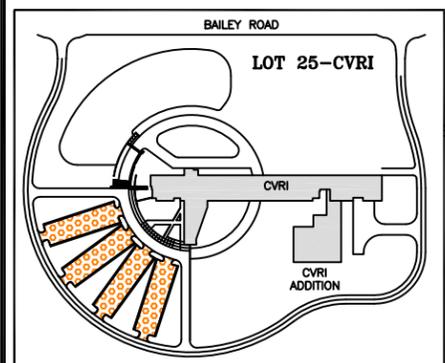
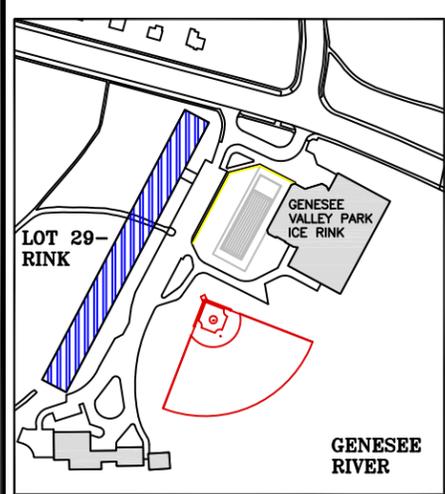
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UNIVERSITY OF ROCHESTER PARKING AREAS

- RIVER CAMPUS STUDENT PARKING AREAS
- RIVER CAMPUS FACULTY/STAFF PARKING
- MEDICAL CENTER PARKING AREAS
- VISITOR PARKING AREAS
- RPC LOT AREAS
- RINK LOT AREAS
- RIVER VIEW APARTMENTS AREAS
- SCIENCE PARKWAY AREAS
- CVRI AREAS
- SCOTTSVILLE ROAD AREAS
- AMBULATORY SURGERY CENTER @ SAWGRASS
- LATTIMORE BUILDING



03-27-12
KEVIN KEHOE
CAMPUS PLANNING, DESIGN, & CONSTRUCTION
PARKING AREA PLAN
NOT TO SCALE (VISUAL USE ONLY)

APPENDIX ‘J’

Parking Calculations for Master Plan Buildout M/A/B

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Travel Demand Management

To meet the shortfall in parking supply, a strong Travel Demand Management (TDM) program will be needed. Priority for campus parking spaces will continue to be given to patients and visitors, accessible (ADA) parking and servicing needs. The shortfall will therefore mainly be addressed by focusing on employees' and students' travel patterns and parking habits. TDM will need to address not only commuting needs but also campus circulation and travel to/from satellite locations, much of which is currently undertaken by automobile.

The primary alternative modes drivers can switch to are transit, ridesharing, cycling, walking and park-and-ride. Each of these meets the specific needs of a particular group of people, often fulfilling needs that are currently unmet. But it will also be important to support people who wish to make the switch, by removing potential obstacles or offering incentives. Where this approach has been adopted, the clear conclusion has been that subsidizing alternatives to encourage employees/students not to drive alone makes economic sense, as the incentives are generally much cheaper than building parking structures.

The University already has several TDM elements in place, including:

- Zipcars (cars available on-campus to be rented by the hour)
- A Guaranteed Ride Home service (operated regionally)
- A ridematching 'bulletin board'
- On-campus bicycle hire
- Recently-introduced shuttles to satellite locations at Wyeth and Corporate Woods
- Recently-introduced neighborhood shuttle to the 19th Ward
- Evening permits for people who do not need to park on-campus during the day

To meet the transportation challenge, the University will need to develop the existing elements and introduce additional elements. Table 1 lists the main areas that the University will need to explore.

Table 1: Potential TDM Elements

Transit Incentives	✓	Neighborhood Commuter Shuttles
	●	U-pass (fare-free access to city transit for the University community)
Carpool / Vanpool Incentives	●	Free or cheaper permits for carpoolers / vanpoolers
	●	Preferential spaces for carpoolers/vanpoolers
	●	Free or subsidized van lease
	●	Ridematching
Cycling Incentives	✓	On-campus bicycle hire
	●	On-campus bicycle shop or servicing
Incentives for All Modes	✓	Guaranteed Ride Home
	●	Parking cash-out
	●	Cash incentive to try other modes
	●	Free occasional parking for non-permit-holders
	●	Prize draws or similar goodies
Supporting Services	✓	Campus shuttles to/from satellite locations
	✓	Shared cars (Zipcar)
	●	Departmental/shared bikes
	●	Evening door-to-door shuttle around campus
	●	Evening SafeRide/shuttle to nearby neighborhoods
Remote Parking	✓	Commuter park-and-ride
	●	Secure remote storage for residents' cars
Flexible Permits	✓	Evening permit
	●	Pay-as-you go daily permit / scratchcard
Management Tools	●	Parking cash-out
	●	TDM Co-ordinator
	●	Personalized travel planning

✓ = Existing program in place, can develop further

● = Additional elements to consider

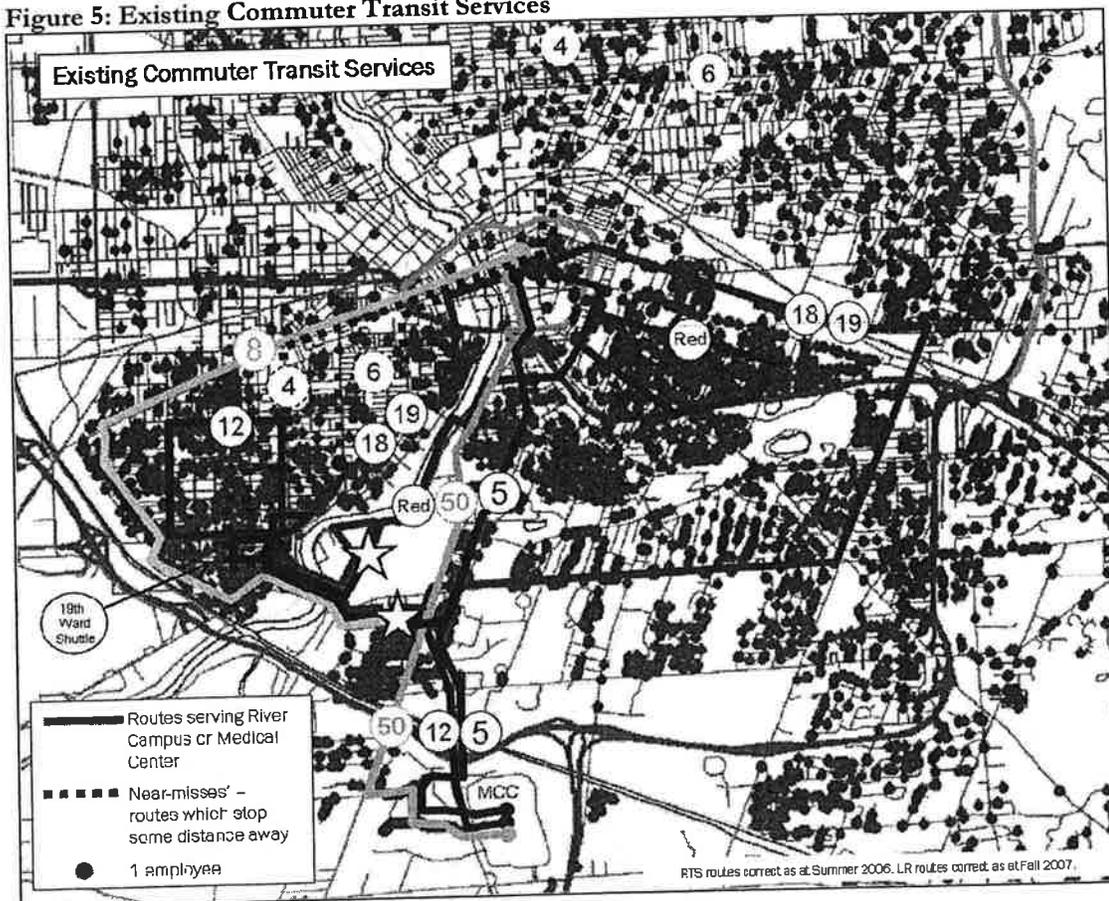
Commuter Transit

City transit services are provided by RTS. Figure 1 shows the RTS routes that serve the campus, along with some additional RTS routes that run close to the campus. It also shows the University's long-established route to/from Downtown, now directly under University control, and the newly-introduced 19th Ward Shuttle serving Brooks Landing and other parts of the 19th Ward. The routes are plotted on top of the home locations of University commuters (each dot represents one person).

U-pass schemes have been very successful at other campuses, and an early goal for the University should be to agree a scheme with RTS. This would allow faculty, staff and students fare-free access to RTS services by showing their University ID. The University would expect to pay RTS an annual flat rate or a per-rider fee, which can then be reinvested in the transit routes that serve the campus. Specific improvements that are desirable include:

- increasing the frequency of existing services to the campus (the current schedules 'just miss' shift start times for many people);
- extending other existing services that come close to the campus; and
- additional services to areas that have large numbers of University employees but no direct buses to campus today.

Figure 5: Existing Commuter Transit Services

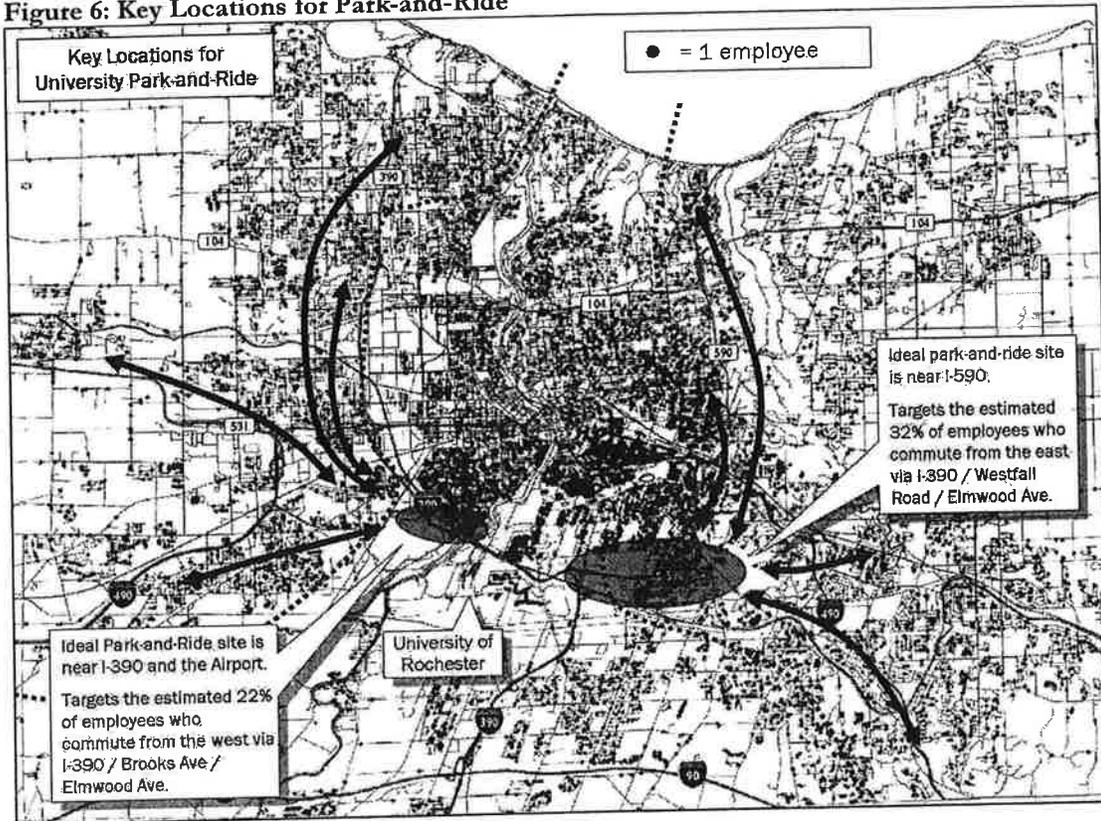


Park-and-Ride

Even if the University community successfully increases the number of people walking, cycling or riding transit to campus, many people will still prefer to drive. A proportion of the parking demand will likely need to be accommodated in additional park-and-ride lots. Currently the University has a small leased lot at IOLA, on Westfall Road, and is considering another leased site to the west of campus. Additional sites will likely be required as the campus grows. Although South Campus can be used to support Mid-Campus parking demand, this will restrict the amount of development possible on South Campus, and ultimately this role will need to be fulfilled by off-campus locations.

Figure 6 plots the home locations of University employees. The best sites for park-and-ride are close to the main access roads (to be convenient for the most people) and as close as possible to the campus (to minimize shuttle costs). The most promising areas are along I-390, east and west of the campus. These would respectively offer convenient park-and-ride to the 32% of employees who commute from the east and the 22% who approach from the west.

Figure 6: Key Locations for Park-and-Ride



Potential Impact of TDM

Because future parking demand will depend on programming and building decisions, it is not possible to lay down firm TDM targets for ultimate build-out. There will always be trade-offs between the amount of parking provided, the amount and mix of development, and the level of TDM that is needed to balance the two.

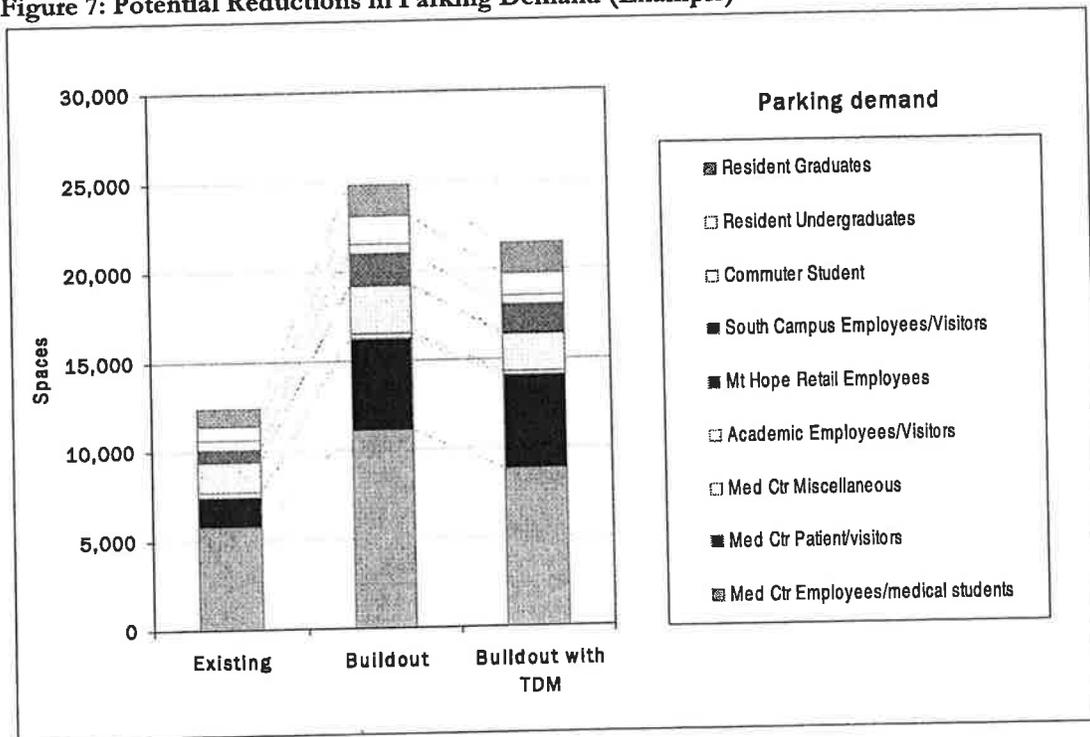
However, as an example of what might need to be achieved, Table 2 shows what would be needed to bring supply and demand into balance, using the buildout supply/demand forecast presented above. A 20% reduction in employee and commuter-student parking demand on River Campus and Mid-Campus, a 10% reduction in South Campus employee parking demand, and a 20% reduction in resident undergraduate parking, would together save 3,300 spaces and thus meet the estimated shortfall. Figure 7 compares this reduced demand to the current level of demand and the 'business as usual' forecast for buildout.

Table 2: Potential Reductions in Parking Demand (Example)

Category of user	Measures	Possible reduction in demand	Spaces saved
Medical Center employees / medical students	<ul style="list-style-type: none"> • Alternative modes • Park-and-ride 	20%	2,200
Academic employees/visitors	<ul style="list-style-type: none"> • Alternative modes • Park-and-ride 	20%	500
South campus employees/visitors	<ul style="list-style-type: none"> • Alternative modes 	10%	200
Commuter students	<ul style="list-style-type: none"> • Alternative modes • Park-and-ride 	20%	100
Resident undergraduates	<ul style="list-style-type: none"> • Remote storage • Alternative modes (less need to bring a car to campus for errands, shopping, etc.) 	20%	300
Total			3,300

All figures are rounded for simplicity.

Figure 7: Potential Reductions in Parking Demand (Example)

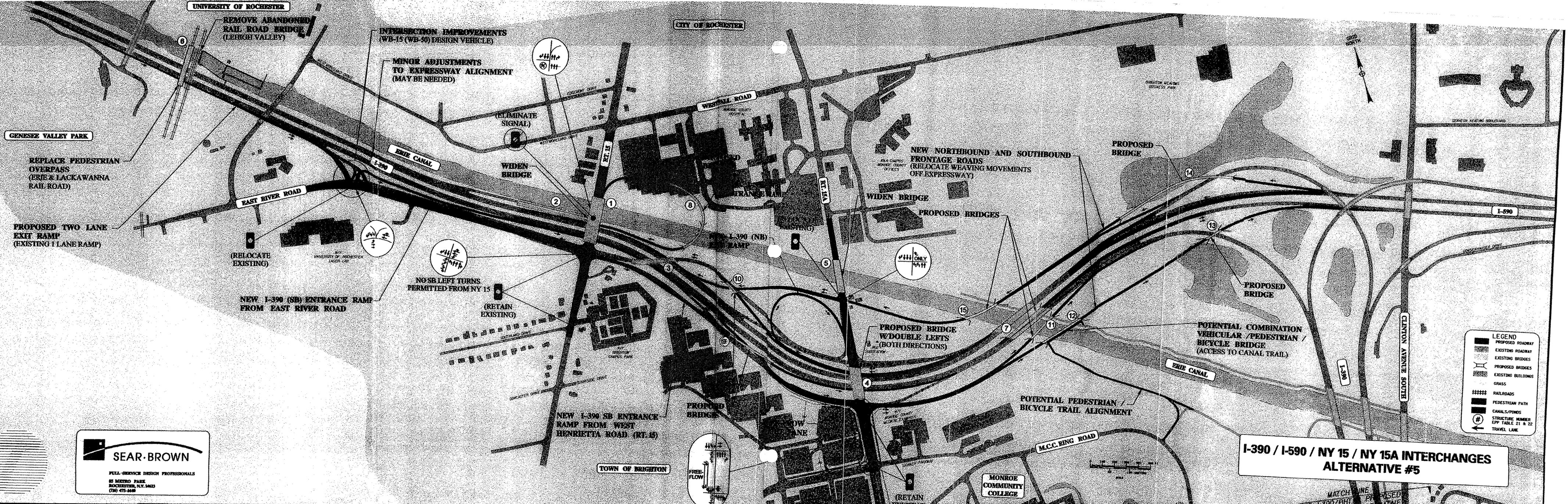


APPENDIX 'K'

Southern Corridor Mobility Study – Alternative E-2

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GENESEE VALLEY PARK

REPLACE PEDESTRIAN OVERPASS (ERIE & LACKAWANNA RAIL ROAD)

PROPOSED TWO LANE EXIT RAMP (EXISTING 1 LANE RAMP)

(RELOCATE EXISTING)

NEW I-390 (SB) ENTRANCE RAMP FROM EAST RIVER ROAD

NO SB LEFT TURNS PERMITTED FROM NY 15

(RETAIN EXISTING)

NEW I-390 SB ENTRANCE RAMP FROM WEST HENRIETTA ROAD (RT. 15)

TOWN OF BRIGHTON

CITY OF ROCHESTER

WEST HILL ROAD

NEW NORTHBOUND AND SOUTHBOUND FRONTAGE ROADS (RELOCATE WEAVING MOVEMENTS OFF EXPRESSWAY)

WIDEN BRIDGE

PROPOSED BRIDGES

PROPOSED BRIDGE W/ DOUBLE LEFTS (BOTH DIRECTIONS)

POTENTIAL PEDESTRIAN / BICYCLE TRAIL ALIGNMENT

M.C.C. KING ROAD

MONROE COMMUNITY COLLEGE

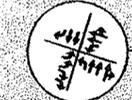
CLINTON AVENUE SOUTH

I-390 / I-590 / NY 15 / NY 15A INTERCHANGES ALTERNATIVE #5

SEAR·BROWN
 FULL-SERVICE DESIGN PROFESSIONALS
 65 METRO PARK
 ROCHESTER, N.Y. 14623
 (716) 475-4400

LEGEND

- PROPOSED ROADWAY
- EXISTING ROADWAY
- PROPOSED BRIDGES
- EXISTING BUILDINGS
- GRASS
- RAILROADS
- PEDESTRIAN PATH
- CANALS/PONDS
- STRUCTURE NUMBER EPP TABLE 21 & 22
- TRAVEL LANE

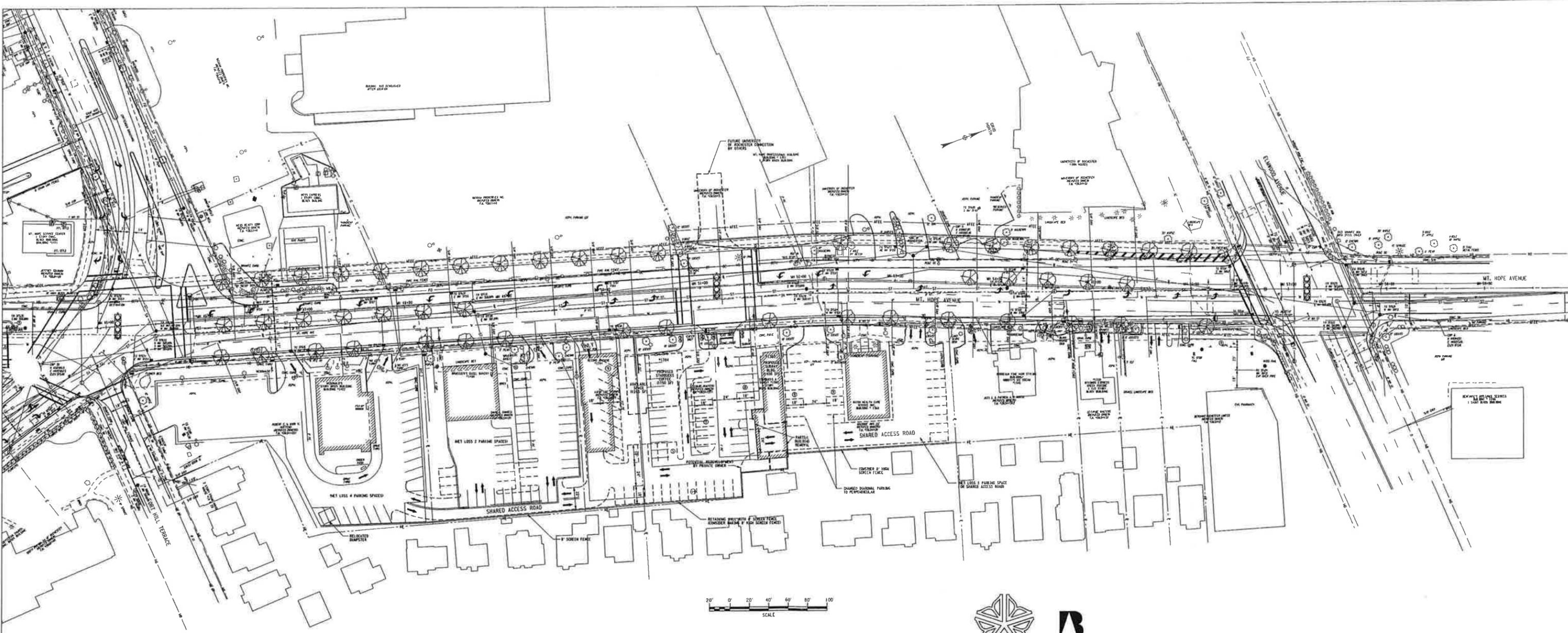


APPENDIX 'L'

Mt. Hope Avenue Roadway Improvements

TY·LININTERNATIONAL

engineers | planners | scientists



MT. HOPE AVENUE - OPTION 1A
 POTENTIAL REDEVELOPMENT AND SHARED ACCESS ROAD
 NOVEMBER 28, 2006
 SCALE: 1"=40'



Bergmann
 ASSOCIATES

APPENDIX 'M'

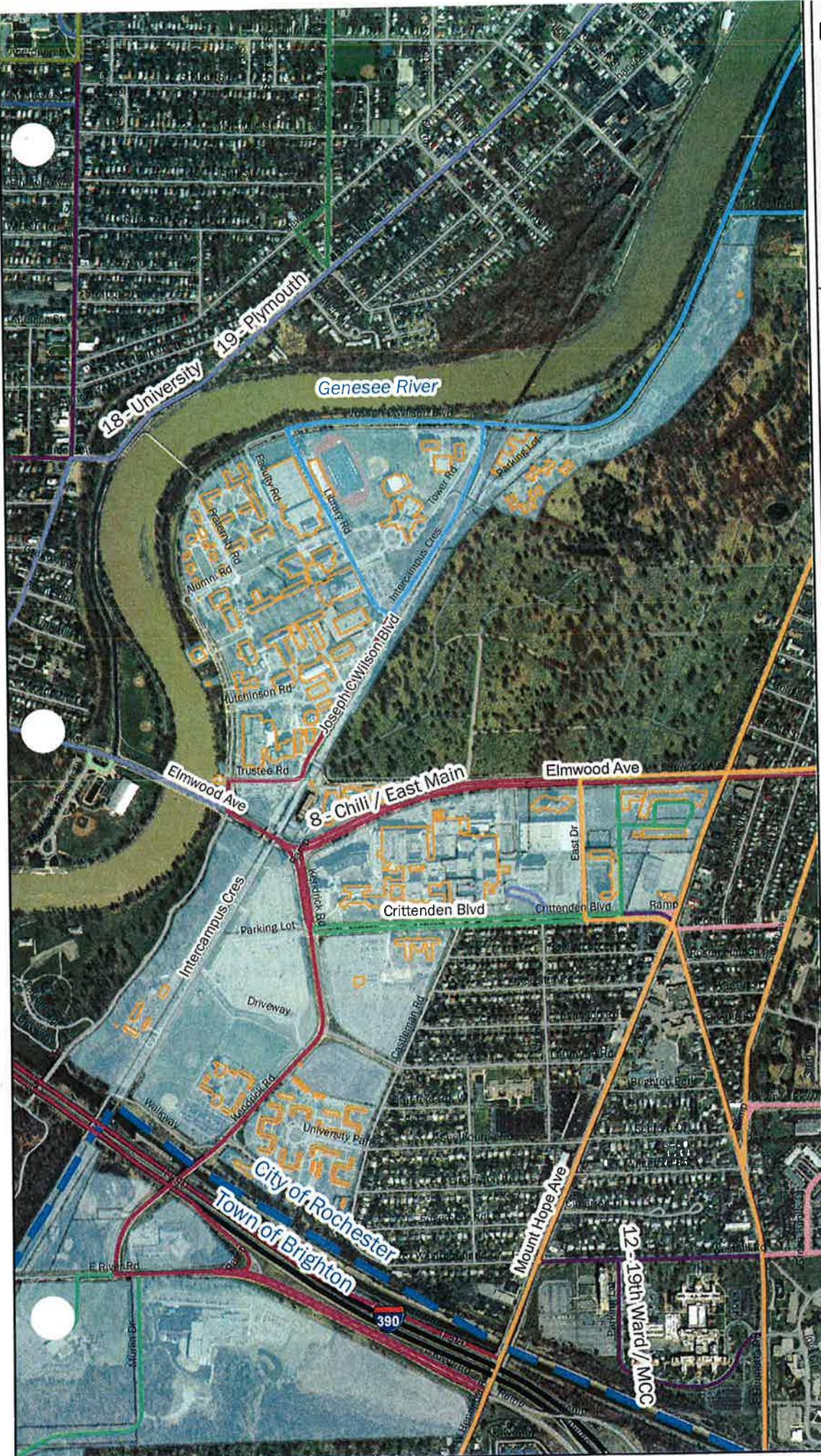
Bus Service

TY·LININTERNATIONAL

engineers | planners | scientists

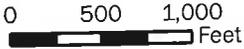
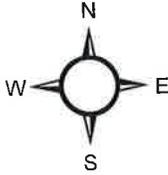
University of Rochester
 City of Rochester
 Planned Development

Figure 18:
 Nearby
 Bus Routes



Legend

- Town/City Boundary
- U of R Buildings
- U of R Parcels
- Streets**
- Local Roads
- County Roads
- State Roads
- Interstate Roads



Planning | Designing | Building

APPENDIX F

**Water Supply Analysis Report &
Revised Water Supply Figures**



MONROE COUNTY WATER AUTHORITY

P.O. Box 10999 • 475 Norris Drive • Rochester, New York 14610-0999

Phone: (585) 442-2000 Fax (585) 442-0220

January 30, 2014

T Y Lin International Group
Attention: James Feeley, PE
255 East Avenue
Rochester, New York 14604

Re: Letter of Intent to provide Water Service to
University of Rochester South Campus – Second
Service connection off of Southland Drive
Town of Brighton, NY

Dear Mr. Feeley,

Monroe County Water Authority (MCWA) has reviewed your inquiry for receiving public water at the above location and has determined that the property is eligible for service and there is enough existing capacity to serve the project as presently designed.

The design and installation of the proposed water service must comply with MCWA Rules and Regulations and Monroe County Department of Health requirements in order to receive final design approval and be placed in operation.

Please contact John Hodgetts if you have any further questions in this regard. John can be reached at (585) 442-2001 ext.277

Yours truly,

A handwritten signature in blue ink, appearing to read 'Tod A. Ferguson', is written over the closing 'Yours truly,'.

Tod A. Ferguson, P.E.
Technical Support Supervisor

cc: John Hodgetts, MCWA

McCann, Jonathan

From: Heidi Young <Heidi.Young@MCWA.com>
Sent: Thursday, August 22, 2013 9:42 AM
To: McCann, Jonathan; Ed Heindl
Subject: RE: MCWA Meeting

Jon,

We should be able to get you the info by the end of this week, no formal request is needed.

-Heidi

Heidi Young
Engineering Department
Monroe County Water Authority
585-442-2001 ext. 246

From: McCann, Jonathan [<mailto:JMcCann@UR.Rochester.edu>]
Sent: Thursday, August 22, 2013 9:03 AM
To: Ed Heindl
Cc: Heidi Young
Subject: FW: MCWA Meeting

Ed,

It would be very helpful to us if we could obtain MCWA assistance in obtaining flow data for the Southland Drive branch. Is there anything we need to do as far as a formal request? What are the next steps and timeframes?

Thanks.

Jon

Jonathan McCann, PMP, LEED AP BD+C

Project Manager
Campus Planning, Design, & Construction Management
University of Rochester
271 East River Road, Box 270347
Rochester, NY 14627
(585) 276-5256
Mobile (585) 353-0069



Learn, Discover, Heal, Create - and Make the World Ever Better

From: James Feeley [<mailto:James.Feeley@tylin.com>]
Sent: Tuesday, August 20, 2013 9:14 AM
To: McCann, Jonathan
Cc: Mischissin, Steve; Peter A. L. Brincka
Subject: RE: MCWA Meeting

Jon, I think that will certainly work. This option was discussed earlier in the project, but the Campus expressed a keen interest in connecting West Henrietta Road to East River Road.

I'd suggest if you're going to go to that effort, you might want to tie Southland Drive to East River Road to give you the redundancy options that we've been discussing.

Please let me know when you get flow data from ED. The change to the model is not a major undertaking at this point.

Regards,

Jim

James Feeley, PE, LEED AP
Senior Mechanical Engineer
TYLIN INTERNATIONAL
255 East Avenue
Rochester, NY 14604
585.512.2000 main
585.512.2082 direct
585.747.6726 mobile
585.697.3449 fax
james.feeley@tylin.com
Visit us online at www.tylin.com

"One Vision, One Company"

Please consider the environment before printing.

From: McCann, Jonathan [<mailto:JMcCann@UR.Rochester.edu>]

Sent: Wednesday, August 14, 2013 4:08 PM

To: James Feeley

Cc: Mischissin, Steve

Subject: MCWA Meeting

Jim,

We had a meeting with MCWA yesterday morning. During the meeting we introduced them to our Master Plan for the South Campus and then discussed the Imaging Building. I shared your most recent report with them and they provided me with a map which I have marked up and attached. They are suggesting that we tie-in to the 6 inch as shown to create the loop. Ed mentioned that they can obtain flow data for us in about a week. I would like to include this option in the modeling. Please let me know your thoughts on this and what the next steps are.

Thanks.

Jon

Jonathan McCann, PMP, LEED AP BD+C

Project Manager

Campus Planning, Design, & Construction Management

University of Rochester

271 East River Road, Box 270347

Rochester, NY 14627

(585) 276-5256

Mobile (585) 353-0069



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engineers | planners | scientists

Engineer's Report

Imaging Building Water System Flow Analysis

PREPARED FOR:

University of Rochester
Campus Planning, Design &
Construction Management
University of Rochester
271 East River Road
Rochester, NY 14627

PREPARED BY:

James B. Feeley, P.E.
TYLI International
255 East Avenue
Rochester, New York 14604
10 September 2013



Background

TY Lin has been asked to analyze the University's options for providing water service to the Imaging Science building and a future 2-story medical office building along East River Road. UR has asked that TY Lin model and analyze the pressure impact on the existing water service mains when domestic and fire water service lines are connected to the existing 8" loop surrounding the Laboratory for Laser Energetics (LLE) building. The flow model has also been arranged to show the pressure impacts of adding a second 8" loop connecting the 8" main on Murlin Drive to the main on East River Road. Finally, the impact of cross connecting the East River Road service main with the West Henrietta Road main has been incorporated into the model.

Analysis

Existing Loop

The existing 8" Loop is the last connected service at the end of an 8" main running from West to East along East River Road. The 8" line runs south from the road main, splitting at the Northwest end of the LLE lot and encircling the building. The Domestic water service enters the building on the Northwest side of the building, and three separate fire service entrances serve the three main areas of the building.

Proposed 8" Loop

One option investigated requires tapping into an 8" main running North-South along Murlin Drive (Southwest of LLE), running East for several hundred feet, then heading Northeast towards East River Road before turning West and connecting to the existing valve at the East end of the existing 8" service main.

Proposed 8" Secondary Tie-In

Another option investigated requires tapping into the 8" main running North-South along Murlin Drive (Southwest of LLE), running East for several hundred feet, then heading Northeast towards East River Road as above, but back-connecting to the LLE loop rather than running in a complete secondary loop back to East River Road.

West Henrietta Road Connection

TY Lin was also asked to investigate the option of connecting to an 8" main running North on West Henrietta Road. This would effectively connect the East River Road, Murlin Drive, and West Henrietta Road service mains in a loop. While this is obviously a major undertaking, it offers a significant benefit in providing both UR and the Town of Henrietta with greater versatility in serving the distribution mains in the area. Both Monroe County Water Authority and the University had expressed interest in pursuing this option.

Southland Drive Connection

TY Lin was also asked to investigate the option of connecting the service mains at East River Road and at Southland Drive with a new main to improve the University's options for serving their water demand. This option was evaluated with two different approaches- one approach was to connect the service at Southland with a line running nearly due North, between the existing Laser Lab and the new Imaging building, and connecting to the existing 6" main at East River Road. The second approach involved connecting at Southland, but running East, around the Imaging and proposed future building, before looping back and connecting to the east River Road main. This second option was investigated primarily to determine if there was a significant

operational benefit to installing the additional piping, but the difference in available pressure between the two options was minimal.

All options were modeled using flow demand provided by UR for hydrants located around LLE, and hydrant flow data from Murlin Drive and West Henrietta Road provided by Ed Heindl from Monroe County Water Authority. The following assumptions were used in developing our model:

- A significant volume of domestic water is used in the Laboratory for Laser Energetics building at certain times of the year. This volume, primarily process and cooling makeup water runs automatically, and would continue to draw in the event that fire pumps were brought into operation. A flowrate of 190 GPM has been entered into our model as a continuous demand in the LLE building, and is reflected in all of the modeling scenarios. Other domestic water demands (for the Imaging and future buildings) are not shown concurrent with fire demands.
- Domestic water demands of 300 GPM for the Imaging Science building and 130 GPM for the future office building were used.
- Fire protection demands off 565 GPM for the Imaging Science building and 450 GPM for the future office building were used.
- All loop piping (existing and proposed new) is modeled at 8", with the exception of the last 40' of service piping into the buildings, which are modeled at 6".
- Hydrant flow data provided by the University shows available static pressure at East River Road of 40 PSIG (at zero flow), and pressure drop of 10 PSI at a flow of approximately 400 GPM. The flow model reflects available inlet pressure and flow based on these static and residual pressures.
- Hydrant flow data provided by MCWA shows available static pressure at Murlin Drive of 40 PSIG (at zero flow), and residual pressure of 34 PSI at a flow of approximately 940 GPM. The flow model reflects available inlet pressure and flow based on these static and residual pressures.
- Hydrant flow data provided by MCWA shows available static pressure at West Henrietta Road of 47 PSIG (at zero flow), and residual pressure of 33 PSI at a flow of approximately 909 GPM. The flow model reflects available inlet pressure and flow based on these static and residual pressures.

The results are shown below in Table 1:

Table 1: Available Pressure Under various Modeling Scenarios

Model Conditions:	Flow (GPM)	Available Pressure at LLE DCW Service Entrance	Available Pressure at LLE Fire Service Entrance	Available Pressure at Imaging DCW Service Entrance	Available Pressure at Imaging Fire Service Entrance	Available Pressure at Future DCW Service Entrance	Available Pressure at Future Fire Service Entrance
1 Existing 8" Loop; LLE DCW Service at design Flow; 400 gpm Fire Demand	590	31.3	30.4	*	*	*	*
2 Existing 8" Loop; LLE and Imaging DCW Services at design Flow; No Fire Demand	490	33.1	*	28.3	*	*	*
3 Existing 8" Loop; LLE DCW Service at design Flow; Imaging Fire Demand	755	28.0	*	*	21.4	*	*
4 Existing 8" Loop; LLE, Imaging and future DCW Services at design Flow; No Fire Demand	620	30.7	*	25.4	*	25.5	*
5 Existing 8" Loop; LLE DCW Services at design Flow; Future Fire Demand	640	30.3	*	*	*	*	23.9
6 Existing + new 8" Loop; all DCW Services at design Flow; No Fire Demand	620	35.4	*	31.0	*	31.1	*
7 Existing + new 8" Loop; LLE DCW Service at design Flow; Future Building Fire Demand	640	35.2	*	*	*	*	29.7
8 Existing + new 8" feed tying to ex'g LLE loop; LLE DCW Service at design Flow; Future Building Fire Demand	640	35.2	*	*	*	*	29.5
9 Existing + new 8" line from ERR to WHR; LLE DCW Service at design Flow; Imaging Building Fire Demand	755	37.3	*	*	31.8	*	*
10 Existing + new 8" line from ERR to WHR; LLE DCW Service at design Flow; Future Building Fire Demand	640	39.0	*	*	*	*	33.7
11 Existing + new 8" line from ERR to Southland (East of new bldgs); LLE DCW Service at design Flow; Imaging Building Fire Demand	755	37.7	*	*	32.0	*	*
12 Existing + new 8" line from ERR to Southland (East of new bldgs); LLE DCW Service at design Flow; Future Building Fire Demand	640	39.0	*	*	*	*	33.9
13 Existing + new 8" line from ERR to Southland (West of new bldgs); LLE DCW Service at design Flow; Imaging Building Fire Demand	755	38.3	*	*	31.9	*	*
14 Existing + new 8" line from ERR to Southland (West of new bldgs); LLE DCW Service at design Flow; Future Building Fire Demand	640	39.2	*	*	*	*	31.8

As shown, the available residual pressure would remain above 20 PSI if the listed fire demands for the Imaging or future buildings are applied to the existing LLE loop. However, there is currently no backup water supply to the loop- any interruption of service to that loop will take water service to all three buildings offline.

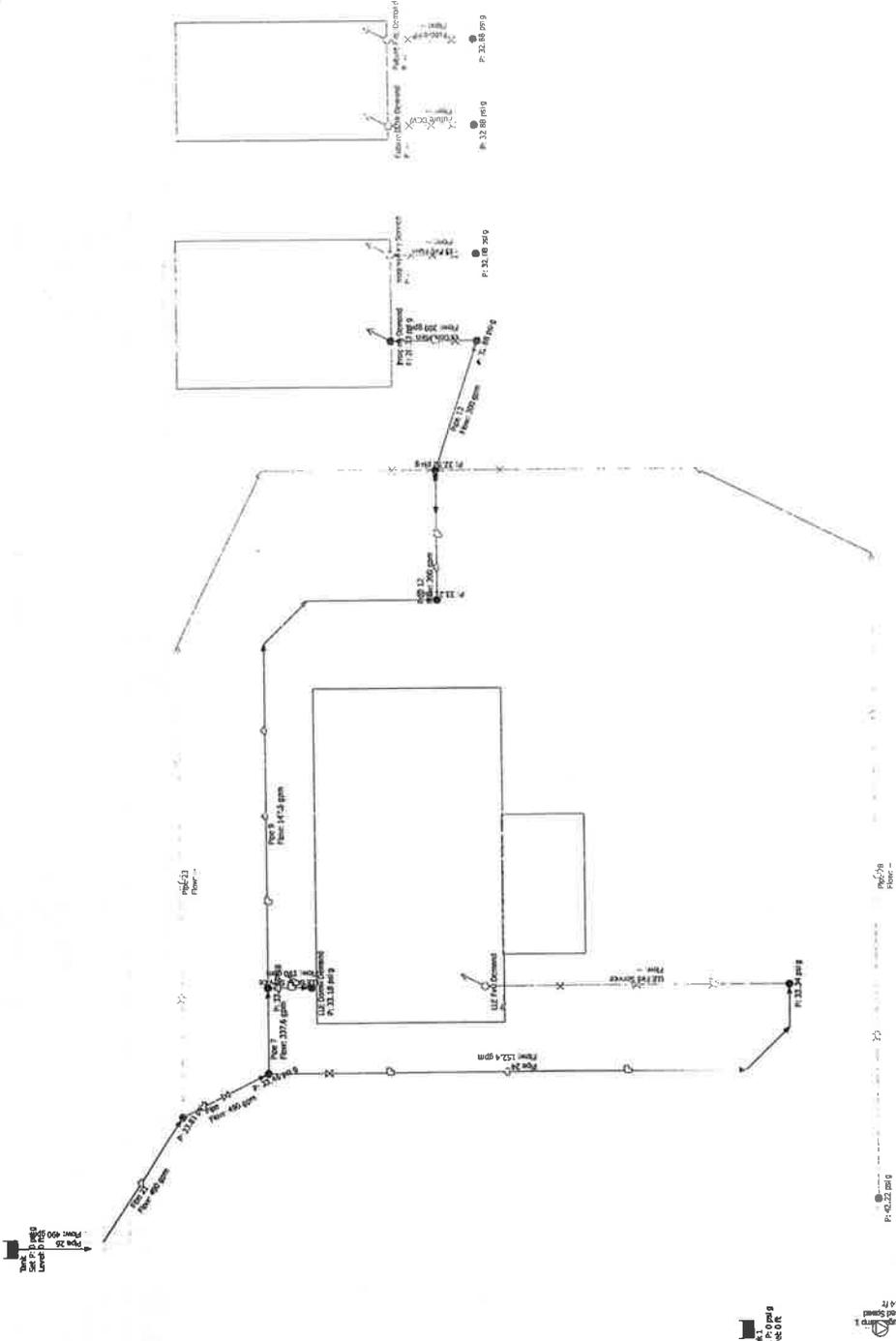
Any of the other pipe looping options evaluated can provide adequate flow with lower loss of available pressure than the option of tying all three buildings into the existing loop. However, connecting the Southland Drive main to the East River Road main makes significantly more flow capacity available and slightly higher residual head pressure available. This option offers the advantage of allowing the LLE building, the Imaging building or the future building to be supplied from either the Southland Drive, Murlin Drive or East River Road mains, providing a greater range of options for continuing to serve buildings while taking existing mains offline for maintenance or repair.

It must be kept in mind that while available flow is adequate, the available pressure at the mains is too low to support normal building operation in a multi-story building without some sort of booster system. Even with the cross connection to the Southland Drive service, booster pumps may be required. Accommodation for either emergency power or a diesel fire pump should be taken into consideration for future buildings.

Recommendations

- Extend the 8" service piping from the main running along Southland Drive. Line should run approximately due north from Southland, running East of the Laser Lab and connecting to the existing service at east River Road. Provide separate 6" domestic and fire service lines from the new 8" line into each building.
- Once the Imaging building's final height is confirmed, evaluate need for fire pumps and domestic boosters. Make infrastructure arrangements for either emergency power or a diesel pump if required.

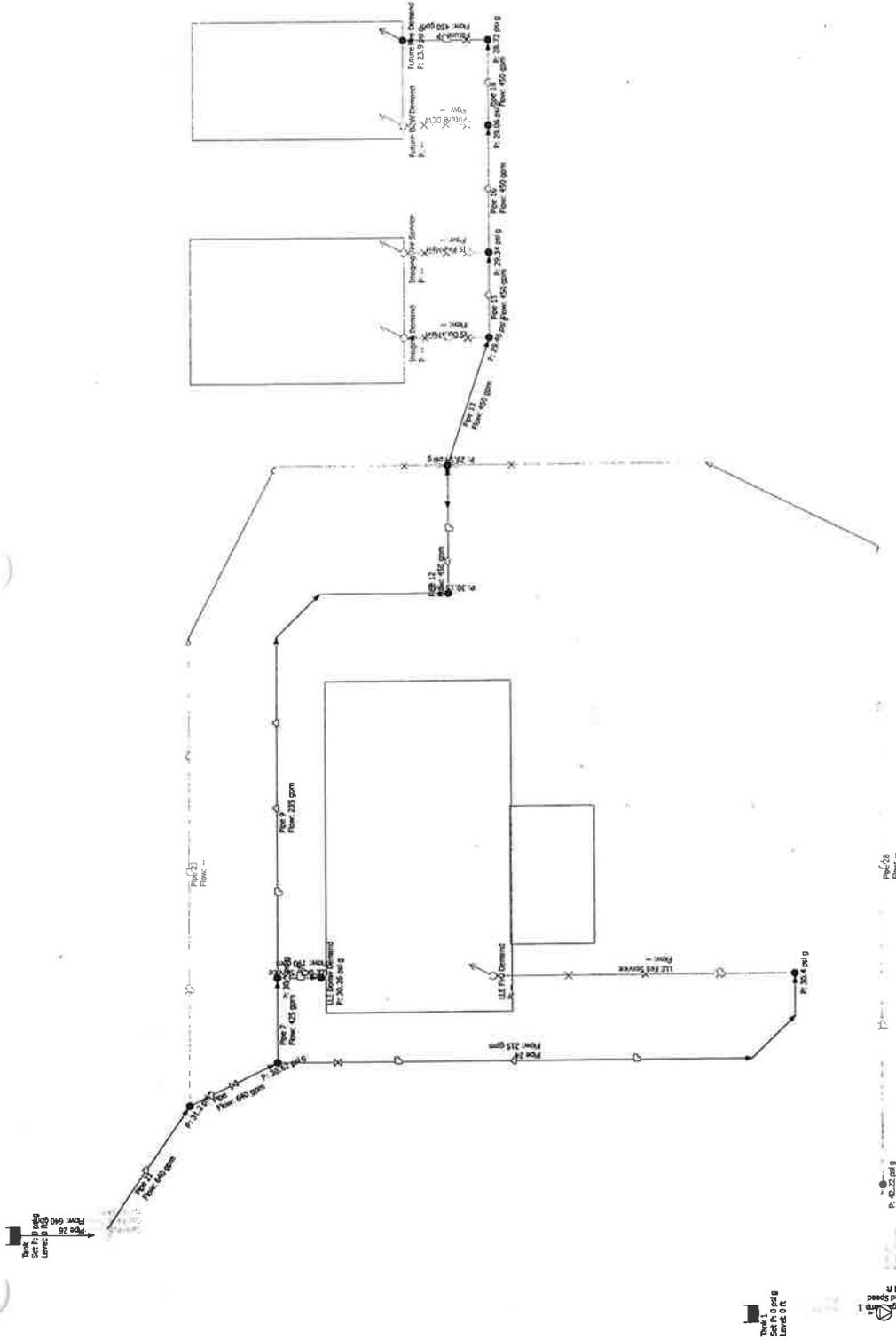
Model 2 Existing Loop, LLE and Imaging DCW Demands, no Fire Demand



PIPE-FLO Professional 12		Units Used		Project Information	
Program Version:	12.0.19520	Flow rate:	Power: hp	Company:	
Calculation Method:	Darcy-Weisbach	Velocity:	Temperature: °F	Project:	
Maximum Iterations:	100	Pressure:	Density: lb/ft³	Drawn by:	Report Model pipe
Iteration Tolerance:	0.01	Elevation:	Viscosity: cP	File Name:	Current
Laminar Cutoff Re:	2100	Length:	Atmospheric Pressure: 14.7 psi a	Lineup:	
		Size:		Print Date:	Wednesday, June 12, 2013 11:45 AM

Model 5 Existing Loop, LLE Domestic

Future Building Fire Demand



PIPEFLO Professional 12

Program Version: 12.0.19520
 Calculation Method: Darcy-Weisbach
 Maximum Iterations: 100
 Iteration Tolerance: 0.01
 Laminar Cutoff Re: 2100

Units Used

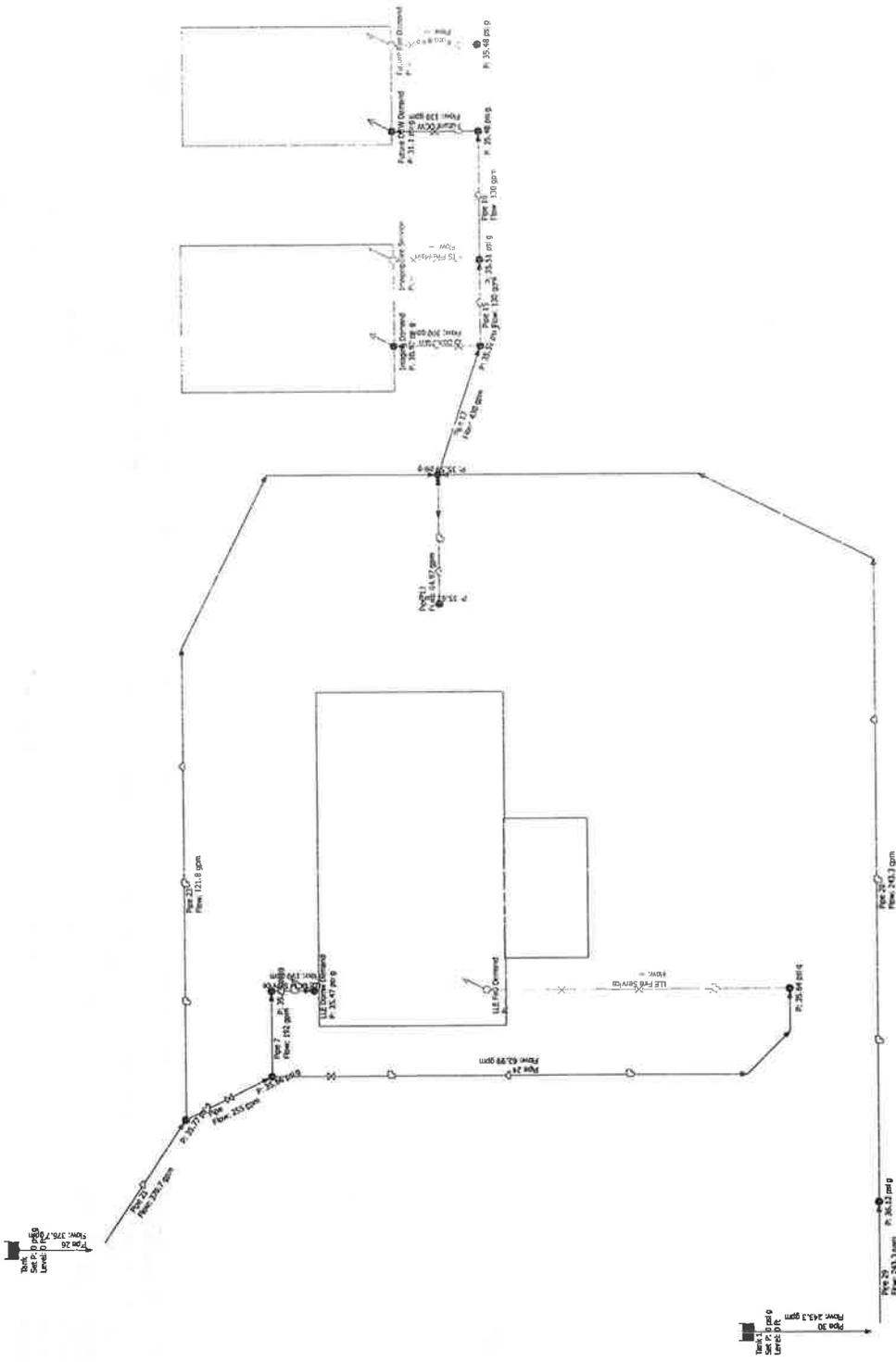
Flow rate: ft/s
 Velocity: psi g
 Pressure: ft
 Elevation: ft
 Length: in
 Size: in

Power: cf
 Temperature: lb/ft³
 Density: cP
 Viscosity: 14.7
 Atmospheric Pressure: psi a

Project Information

Company:
 Project:
 Drawn by: Report Model pipe
 File Name: Current
 Lineup: Current
 Print Date: Wednesday, June 12, 2013 11:40 AM

Model 6, Existing and New Loops, All Buildings Domestic Demand, No Fire Demand.



Project Information

Company:
 Project:
 Drawn by: Report Model.pipe
 File Name: Current
 Lineup: Current
 Print Date: Wednesday, June 12, 2013 11:36 AM

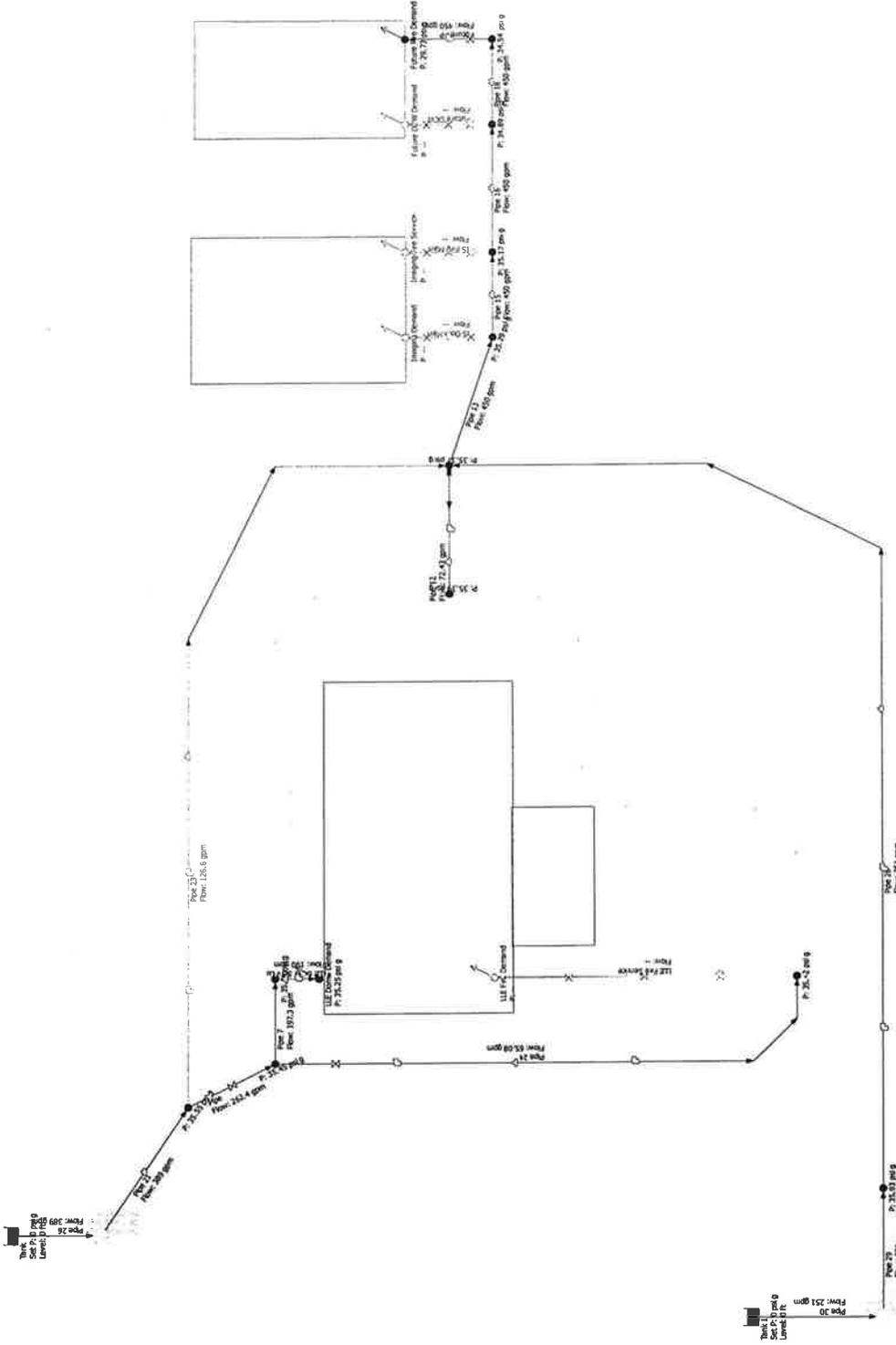
Units Used

Flow rate: gpm
 Velocity: ft/s
 Pressure: psi g
 Elevation: ft
 Length: ft
 Size: in

Power: hp
 Temperature: °F
 Density: lb/ft³
 Viscosity: cP
 Atmospheric Pressure: 14.7 psi a

PIPE-FLO Professional 12

Program Version: 12.0.19520
 Calculation Method: Darcy-Weisbach
 Maximum Iterations: 100
 Iteration Tolerance: 0.01
 Laminar Cutoff Re: 2100



PIPE-FLO Professional 12

Program Version: 12.0.19520
 Calculation Method: Darcy-Weisbach
 Maximum Iterations: 100
 Iteration Tolerance: 0.01
 Laminar Cutoff Re: 2100

Units Used

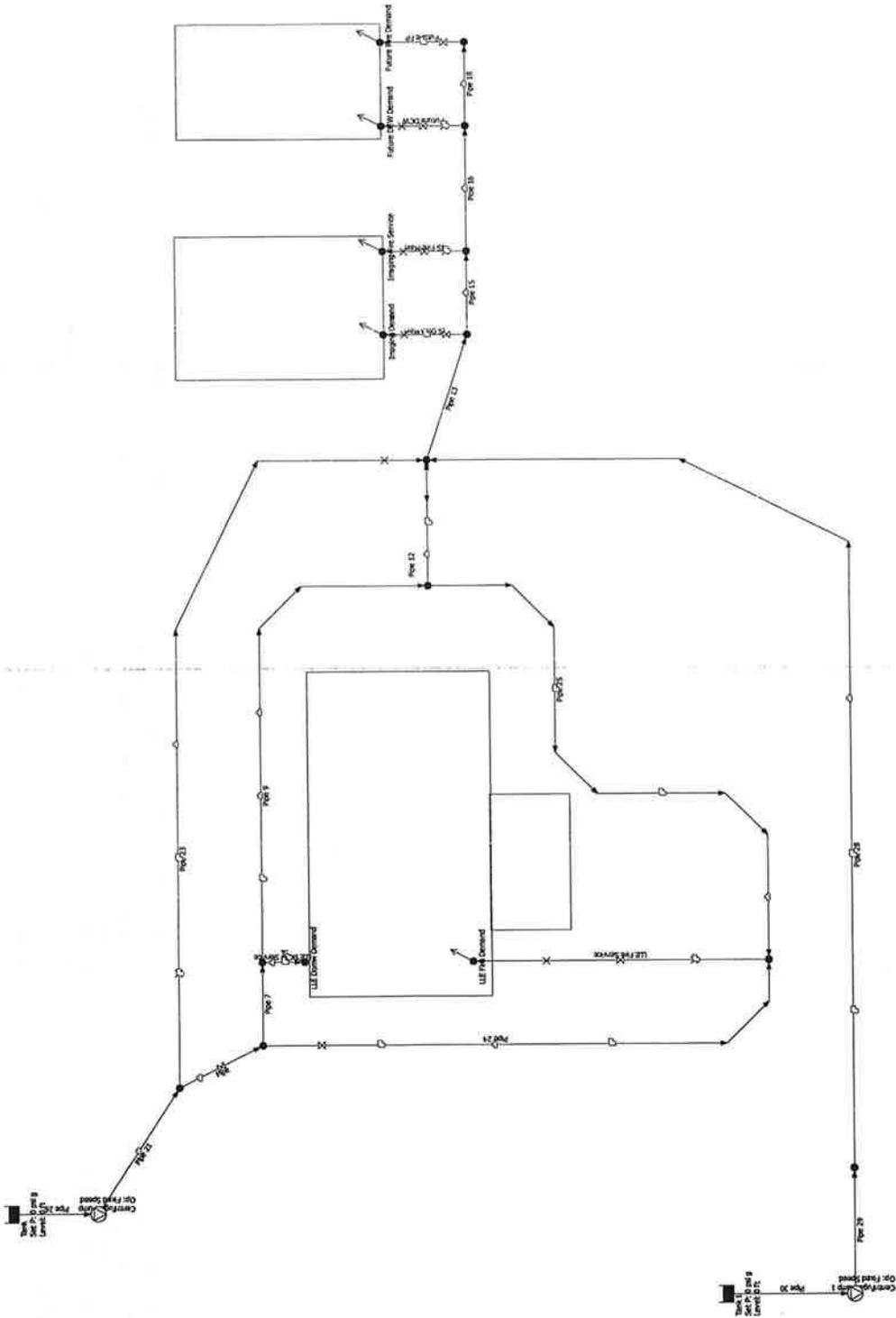
Flow rate: ft/s
 Velocity: ft/s
 Pressure: psi g
 Elevation: ft
 Length: ft
 Size: in

Power: hp
 Temperature: °F
 Density: lb/ft³
 Viscosity: cP
 Atmospheric Pressure: 14.7 psia

Project Information

Company:
 Project:
 Drawn by: Report Model.ppt
 File Name: Current
 Lineup: Current
 Print Date: Wednesday, June 12, 2013 11:35 AM

Model 8: Existing Loop, Conn from Murlin to LLE Loop, LLE DCW Demand, Future Fire Demand



PIPE-FLO Professional 12

Program Version: 12.0.19520
 Calculation Method: Darcy-Weisbach
 Maximum Iterations: 100
 Iteration Tolerance: 0.01
 Laminar Cutoff Re: 2100

Units Used

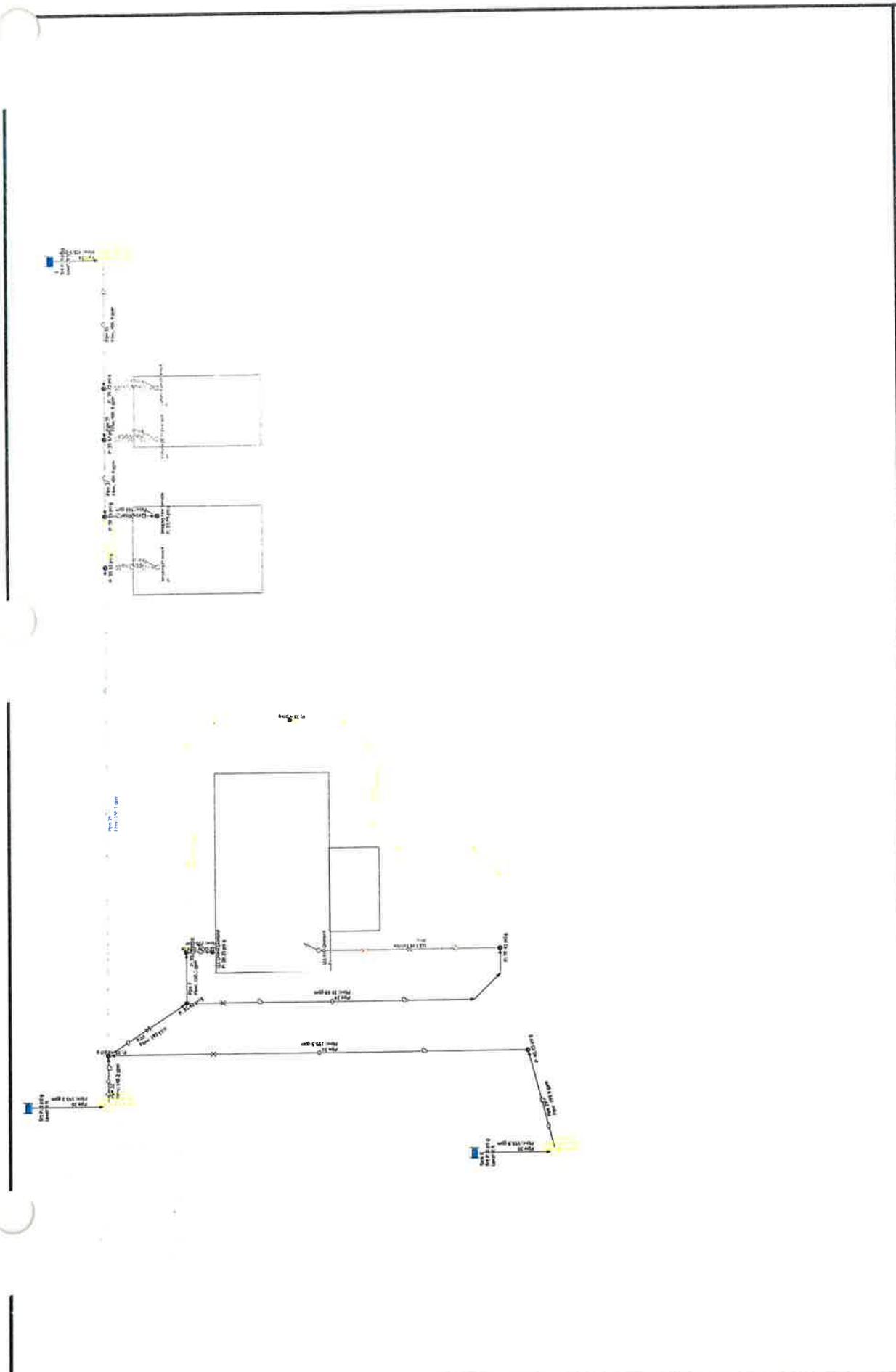
Flow rate: ft/s
 Velocity: ft/s
 Pressure: psi g
 Elevation: ft
 Length: ft
 Size: in

Power: g
 Temperature: lb/ft³
 Density: cP
 Viscosity: psi a
 Atmospheric Pressure: 14.7

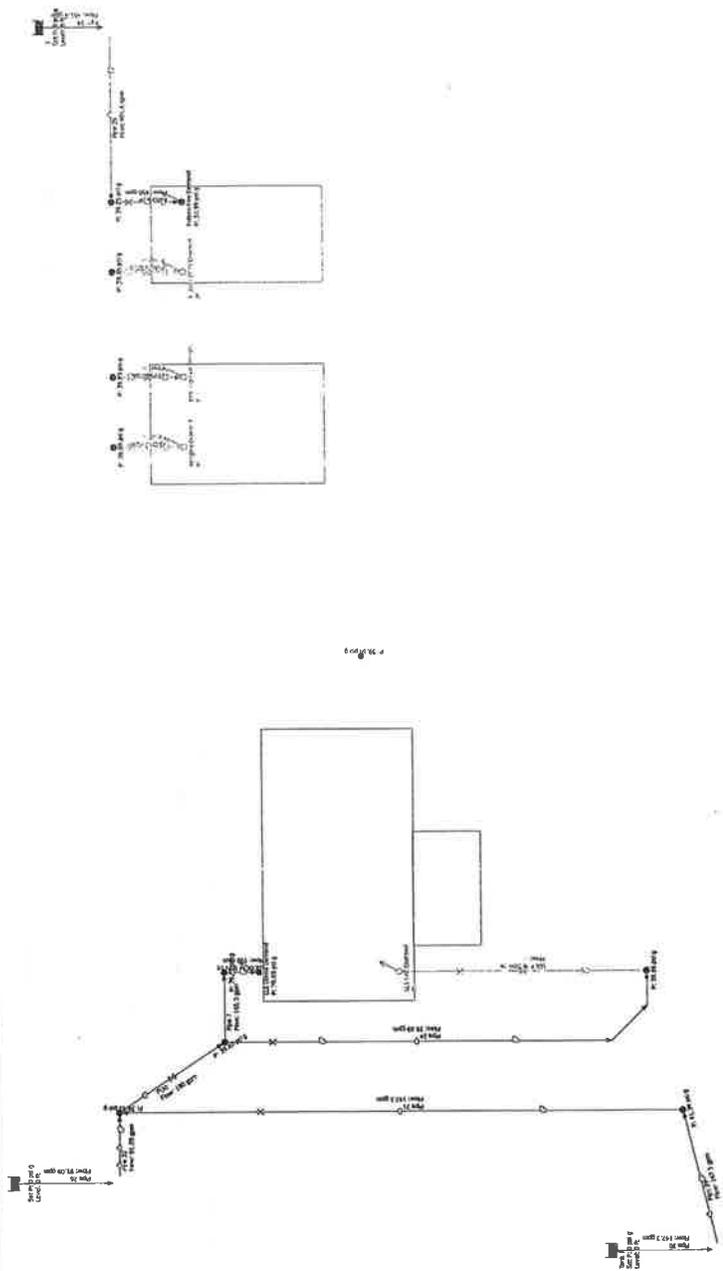
Project Information

Company:
 Project:
 Drawn by: Report Model.pipe
 File Name: Current
 Lineup: Current
 Print Date: Wednesday, June 12, 2013 11:34 AM

Model 9; Existing Loop, Connection to West Henrietta Road: I LE Domestic Water Demand, Imaging Fire Demand



Model 10; Existing Loop, Connection to West Henrietta Road; LLE Domestic Water Demand, Future Fire Demand



PIPE-FLO Professional 12

Program Version: 12.0.19620
 Calculation Method: Darcy-Weisbach
 Maximum Iterations: 100
 Iteration Tolerance: 0.01
 Laminar Cutoff Re: 2100

Units Used

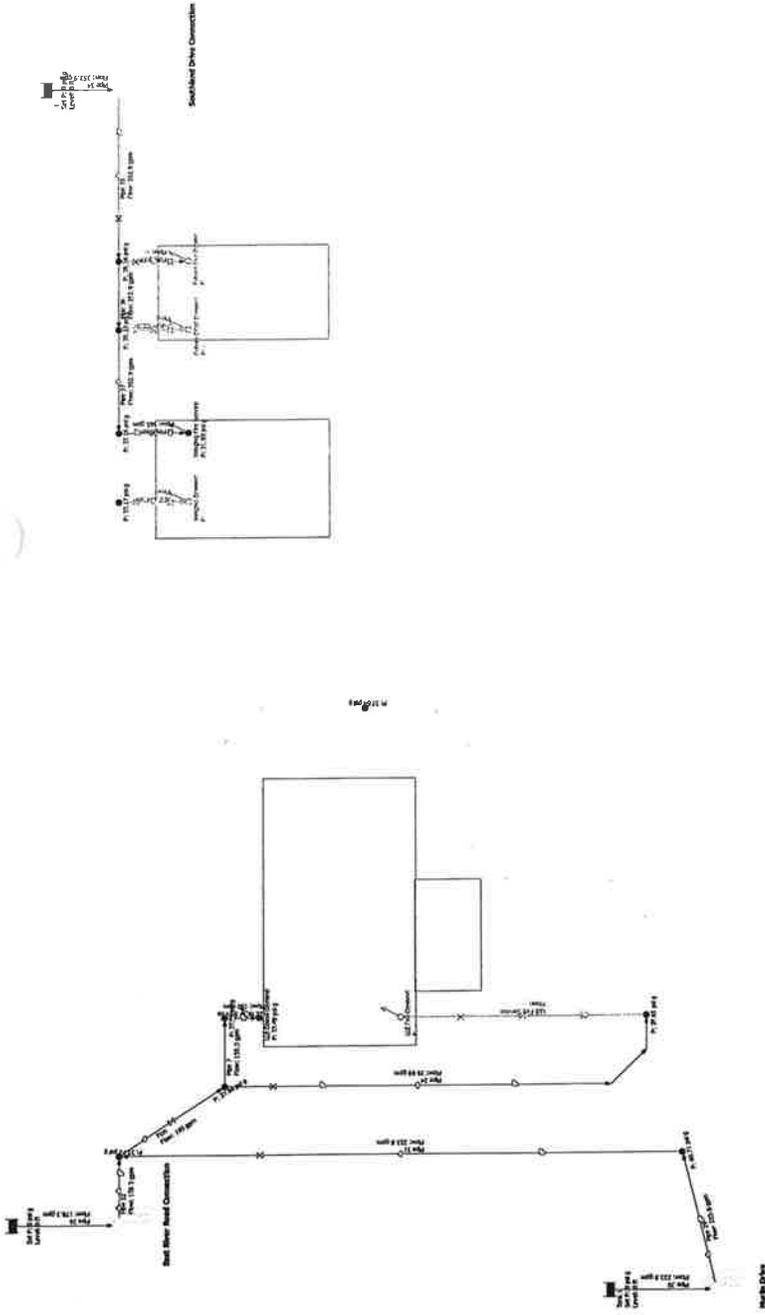
Flow rate: gpm
 Velocity: ft/s
 Pressure: psi g
 Elevation: ft
 Length: ft
 Size: in

Power: hp
 Temperature: °F
 Density: lb/ft³
 Viscosity: cP
 Atmospheric Pressure: 14.7 psi a

Project Information

Company: Current
 Project: Revised Report Model with WH-IR Main.pjce
 Drawn by: Current
 File Name: Current
 Lineup: Current
 Print Date: Friday, August 09, 2013 02:11 PM

Model 11; Existing Loop + Connection to Southland Drive (Long Loop); LLE Domestic + Imaging Fire Demand



PIPE-FLO Professional 12

Program Version: 12.0.19520
 Calculation Method: Darcy-Weisbach
 Maximum Iterations: 100
 Iteration Tolerance: 0.01
 Laminar Cutoff Re: 2100

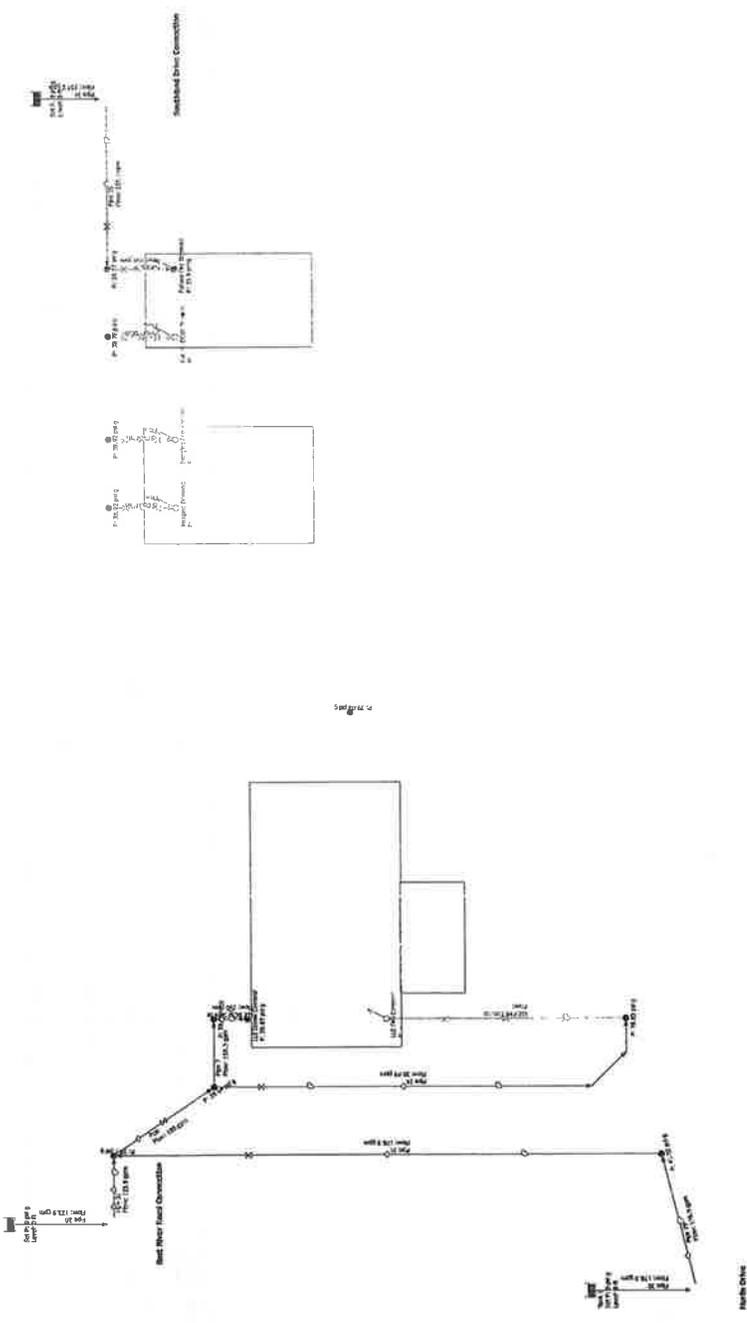
Units Used

Flow rate: ft/s
 Velocity: psi g
 Pressure: ft
 Length: in
 Size: in
 Power: of
 Temperature: lb/ft³
 Density: cP
 Viscosity: 14.7
 Atmospheric Pressure: psi a

Project Information

Company:
 Project:
 Drawn by: 091013 buildings inside loop.pipe
 File Name: Current
 Lineup: Current
 Print Date: Tuesday, September 10, 2013 11:00 AM

Model 12; Existing Loop + Connection to Southland Drive (Long Loop); LLE Domestic + Future Fire Demand



PIPE-FLO Professional 12

Program Version: 12.0.19520
 Calculation Method: Darcy-Weisbach
 Maximum Iterations: 100
 Iteration Tolerance: 0.01
 Laminar Cutoff Re: 2100

Units Used

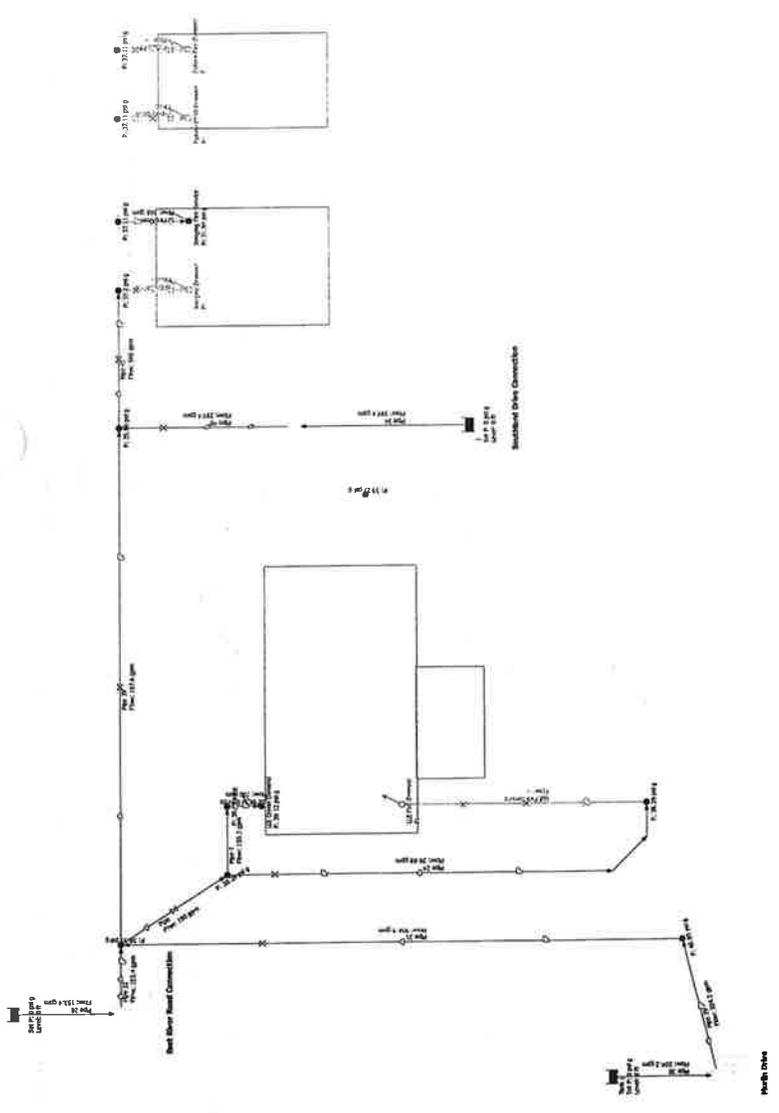
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 Velocity: ft/s
 Pressure: psi g
 Elevation: ft
 Length: ft
 Size: in

Power: hp
 Temperature: °F
 Density: lb/ft³
 Viscosity: cP
 Atmospheric Pressure: 14.7 psi a

Project Information

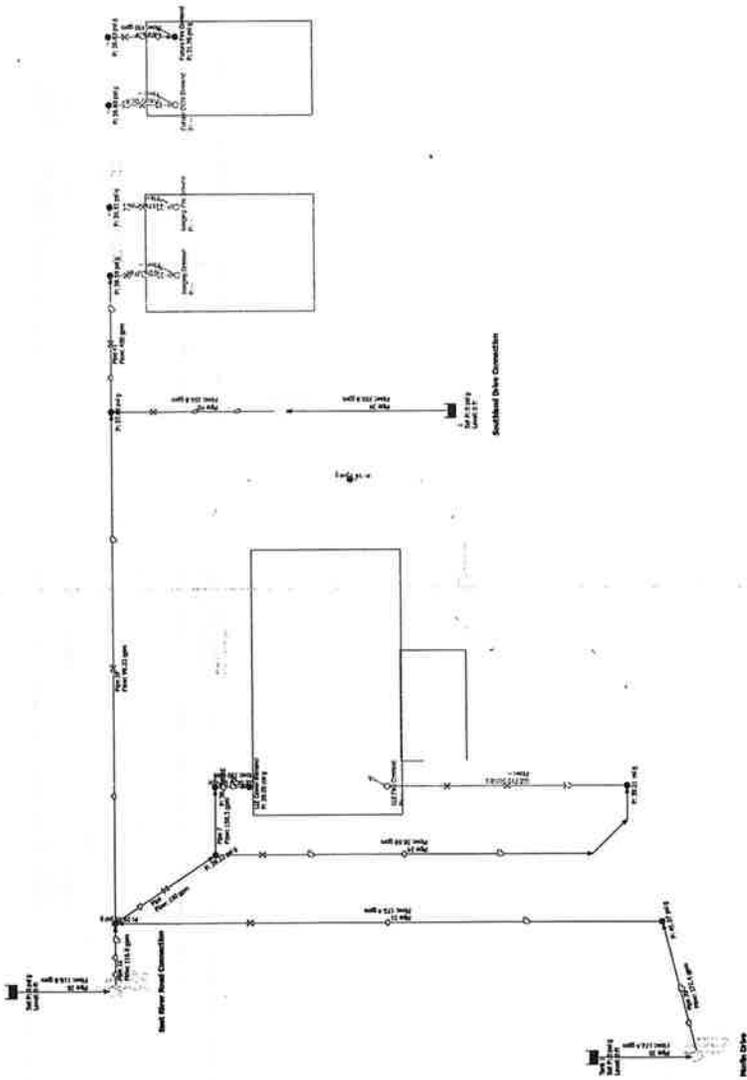
Company:
 Project:
 Drawn by: 091013 buildings inside loop.pipe
 File Name: Current
 Lineup: Current
 Print Date: Tuesday, September 10, 2013 11:01 AM

Model 13; Existing Loop + Connection to Southland Drive (North/South); LLE Domestic + Imaging Fire Demand



PIPE-FLO Professional 12	Units Used	Project Information
Program Version: 12.0.19520 Calculation Method: Darcy-Weisbach Maximum Iterations: 100 Iteration Tolerance: 0.01 Laminar Cutoff Re: 2100	Flow rate: hp Velocity: ft/s Pressure: psi g Elevation: ft Length: ft Size: in	Company: Project: Drawn by: 091013 buildings outside new loop pipe File Name: Current Lineup: Print Date: Tuesday, September 10, 2013 02:14 PM

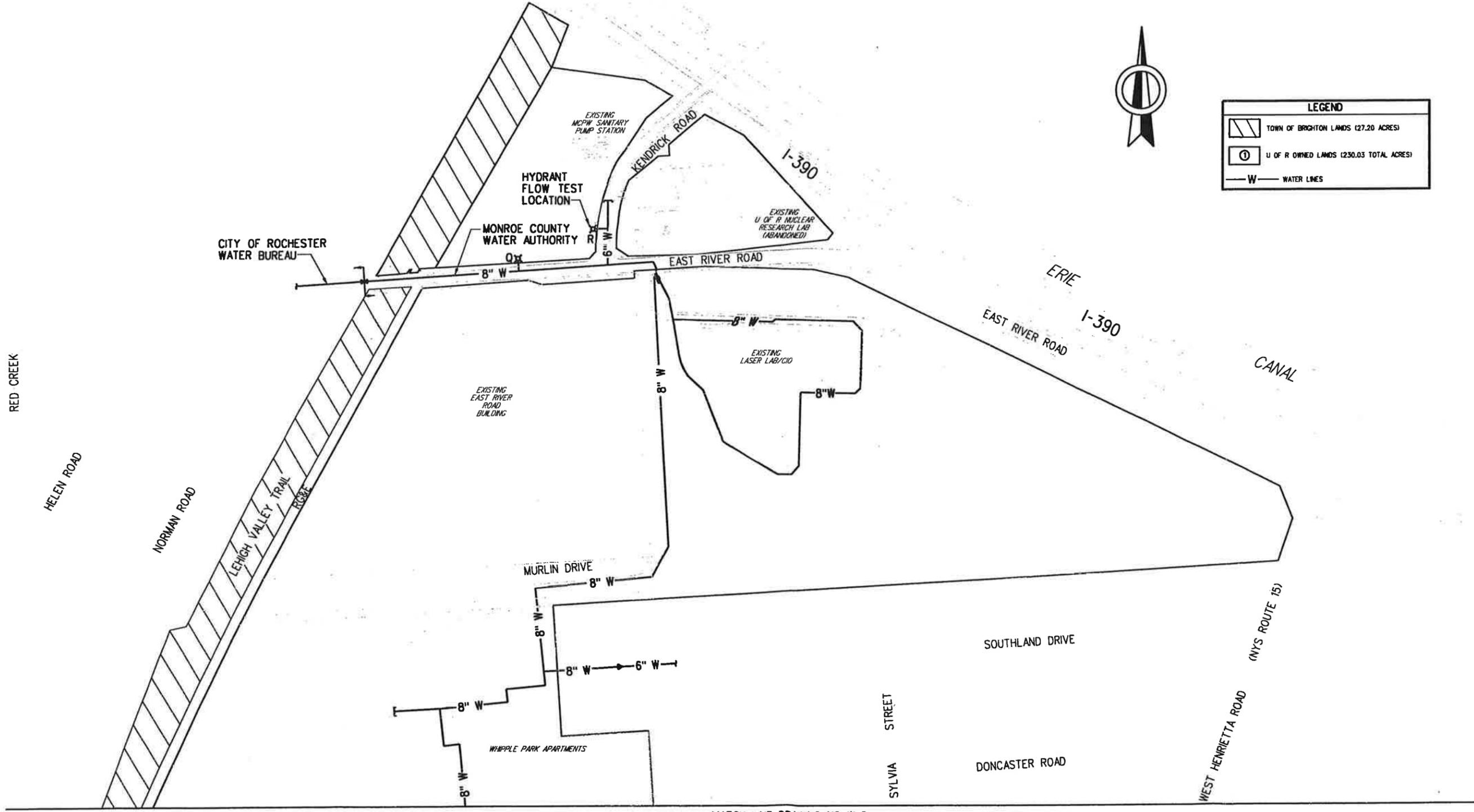
Model 14; Existing Loop + Connection to Southland Drive (North/South); LLE Domestic + Future Fire Demand



PIPE-FLO Professional 12	
Program Version: 12.0.19520 Calculation Method: Darcy-Weisbach Maximum Iterations: 100 Iteration Tolerances: 0.01 Laminar Cutoff Re: 2100	

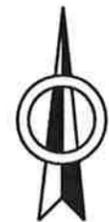
Units Used	
Flow rate:	gpm
Velocity:	ft/s
Pressure:	psi g
Elevation:	ft
Length:	ft
Size:	in
Power:	hp
Temperature:	°F
Density:	lb/ft³
Viscosity:	cP
Atmospheric Pressure:	14.7 psi a

Project Information	
Company:	
Project:	
Drawn by:	
File Name:	091013 buildings outside new loop.pipe
Lineup:	Current
Print Date:	Tuesday, September 10, 2013 02:15 PM



MATCH LINE DRAWING NO. W-2

LEGEND	
	TOWN OF BRIGHTON LANDS (27.20 ACRES)
	U OF R OWNED LANDS (230.03 TOTAL ACRES)
	WATER LINES



UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF NEW YORK STATE EDUCATION LAW ARTICLE 145 SECTION 7209

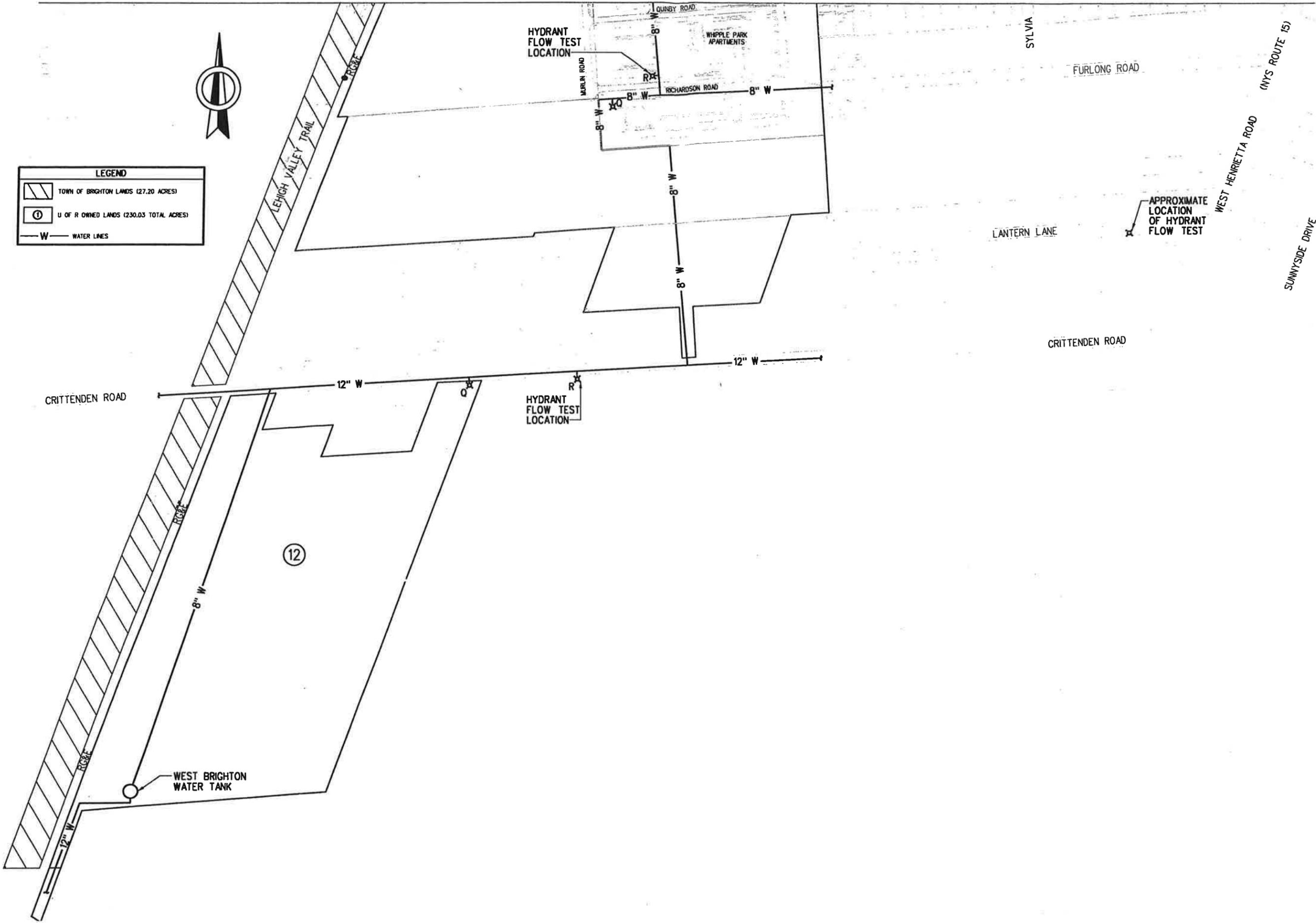
NO.	DATE	DESCRIPTION	REVISIONS
1	7/17/08	WATER SIZE MODIFIED	
2	7/23/05	UPDATE WATER DISTRIBUTION SYSTEM	

TYLIN INTERNATIONAL
 255 EAST AVENUE
 ROCHESTER, NY 14604
 (585) 512-2000

FIGURE 2 -EXISTING WATER DISTRIBUTION SYSTEM
 PROJECT NAME: IPD REZONING
 TOWN OF BRIGHTON COUNTY OF MONROE
 CLIENT: UNIVERSITY OF ROCHESTER

PROJECT NO.:	01-2398	PROJ.MGR.:	DJA
DATE:	AUG. 2005	DRWN.BY:	NEB
SCALE:	NO SCALE	CHKD.BY:	DJA
DRAWING NO.:	W-1		
SHEET NO.:	1 of 2		

MATCH LINE DRAWING NO. W-1



LEGEND

- TOWN OF BRIGHTON LANDS (27.20 ACRES)
- U OF R OWNED LANDS (230.03 TOTAL ACRES)
- WATER LINES

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF NEW YORK STATE EDUCATION LAW ARTICLE 145, SECTION 7209

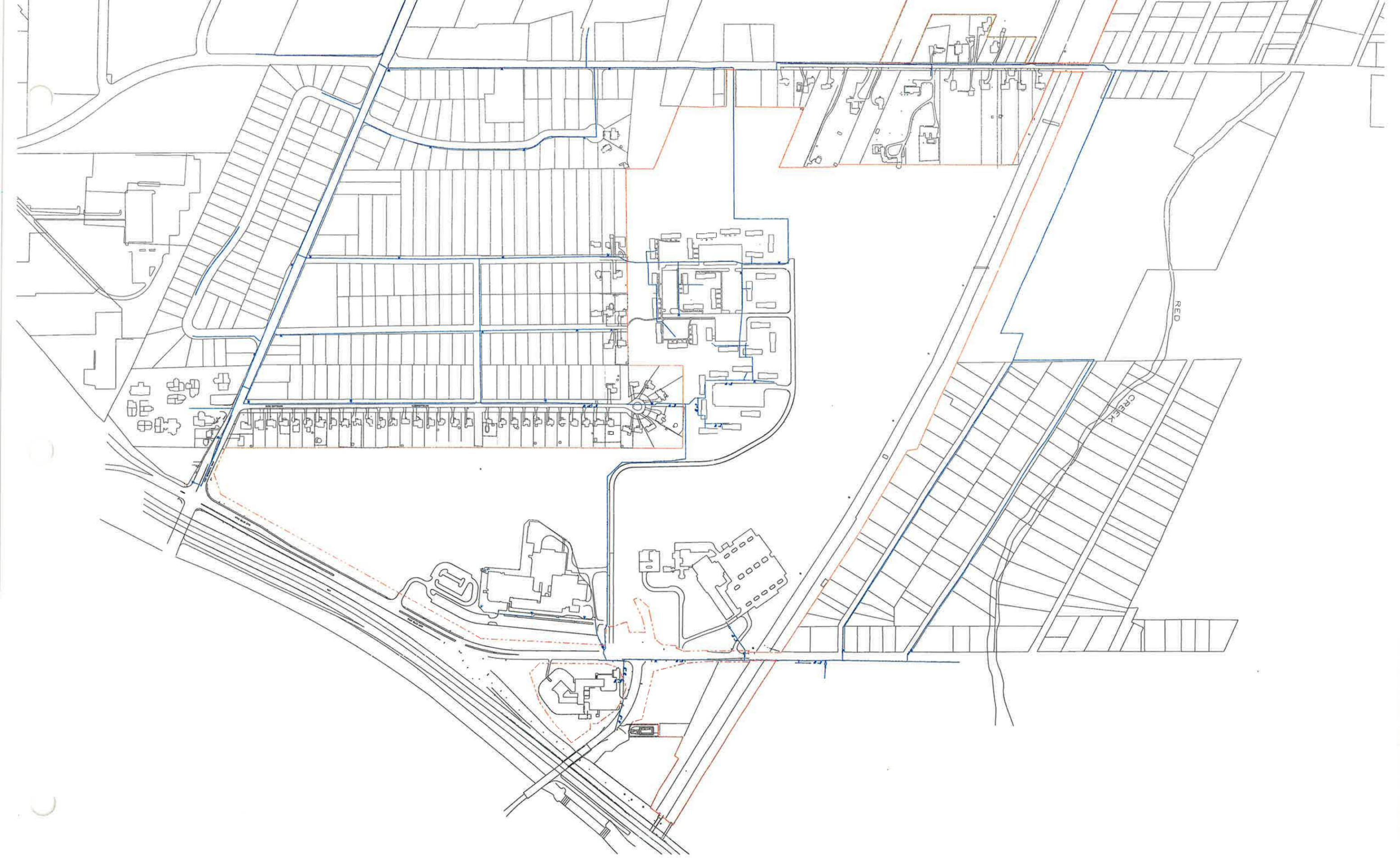
NO.	DATE	DESCRIPTION	REVISIONS
3			
2	7/17/08	LABELING OF PARCEL 12	
1			

DATE _____

TYL INTERNATIONAL
 255 EAST AVENUE
 ROCHESTER, NY 14604
 (585) 512-2000

FIGURE 2 - EXISTING WATER DISTRIBUTION SYSTEM
 PROJECT NAME: IPD REZONING
 TOWN OF BRIGHTON COUNTY OF MONROE
 CLIENT: UNIVERSITY OF ROCHESTER

PROJECT NO:	01-2398	PROJ. MGR.:	DJA
DATE:	AUG. 2005	DRW. BY:	NEB
SCALE:	NO SCALE	CHKD. BY:	DJA
DRAWING NO.:	W-2		
SHEET NO.:	2 of 2		

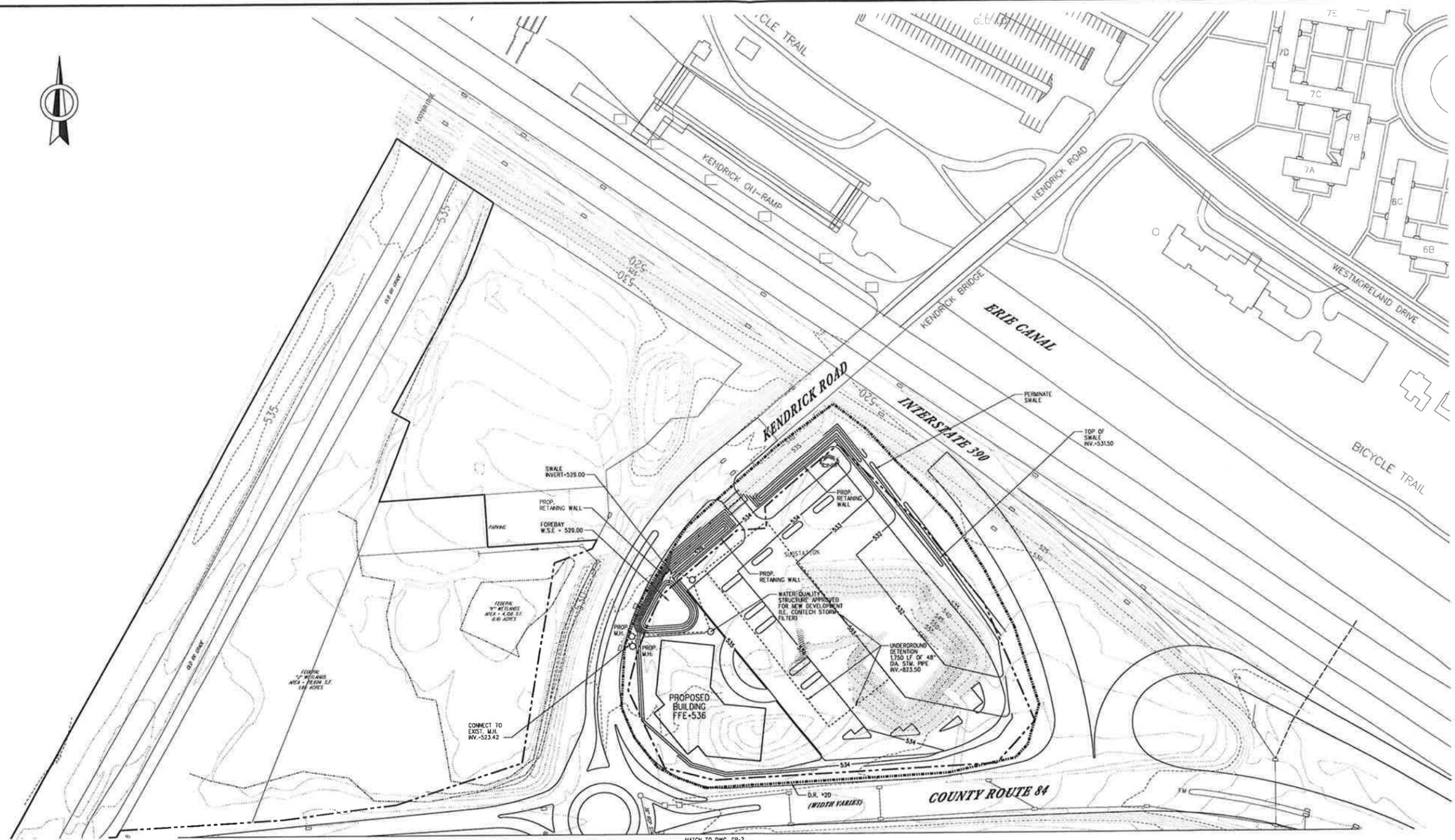


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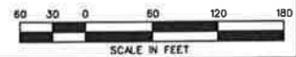
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APPENDIX G

Conceptual Grading Plans



MATCH TO DWG. GP-2



UNIVERSITY OF ROCHESTER IS RESPONSIBLE FOR THE ACCURACY OF THIS DRAWING AS A REPRESENTATION OF THE WORK OF ITS PROFESSIONAL PERSONNEL.	
NO.	DATE
1	
2	
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UNIVERSITY OF ROCHESTER IS RESPONSIBLE FOR THE ACCURACY OF THIS DRAWING AS A REPRESENTATION OF THE WORK OF ITS PROFESSIONAL PERSONNEL.	
NO.	DATE
1	
2	
3	
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5	

DATE

TYLINT INTERNATIONAL
 505 EAST WATKINS
 ROCHESTER, NY 14604
 (585) 517-2000

CONCEPT GRADING PLAN - 1
 PROJECT NAME: **MAPPING FOR REZONE PROPERTY**
 S-06EIS
 CLIENT: **UNIVERSITY OF ROCHESTER**
 271 EAST RIVER ROAD ROCHESTER, NY 14627

PROJECT NO.	PROJ. MSJL.
43.2398.01	DJK
DATE:	DRWN. BY:
12/12/13	XDM
SCALE:	CHECKED BY:
1"=60'	SLG
DRAWING NO.	
GP-1	
SHEET NO.	
1 of 5	



DATE	BY	CHKD	APP'D

NO.	DATE	DESCRIPTION

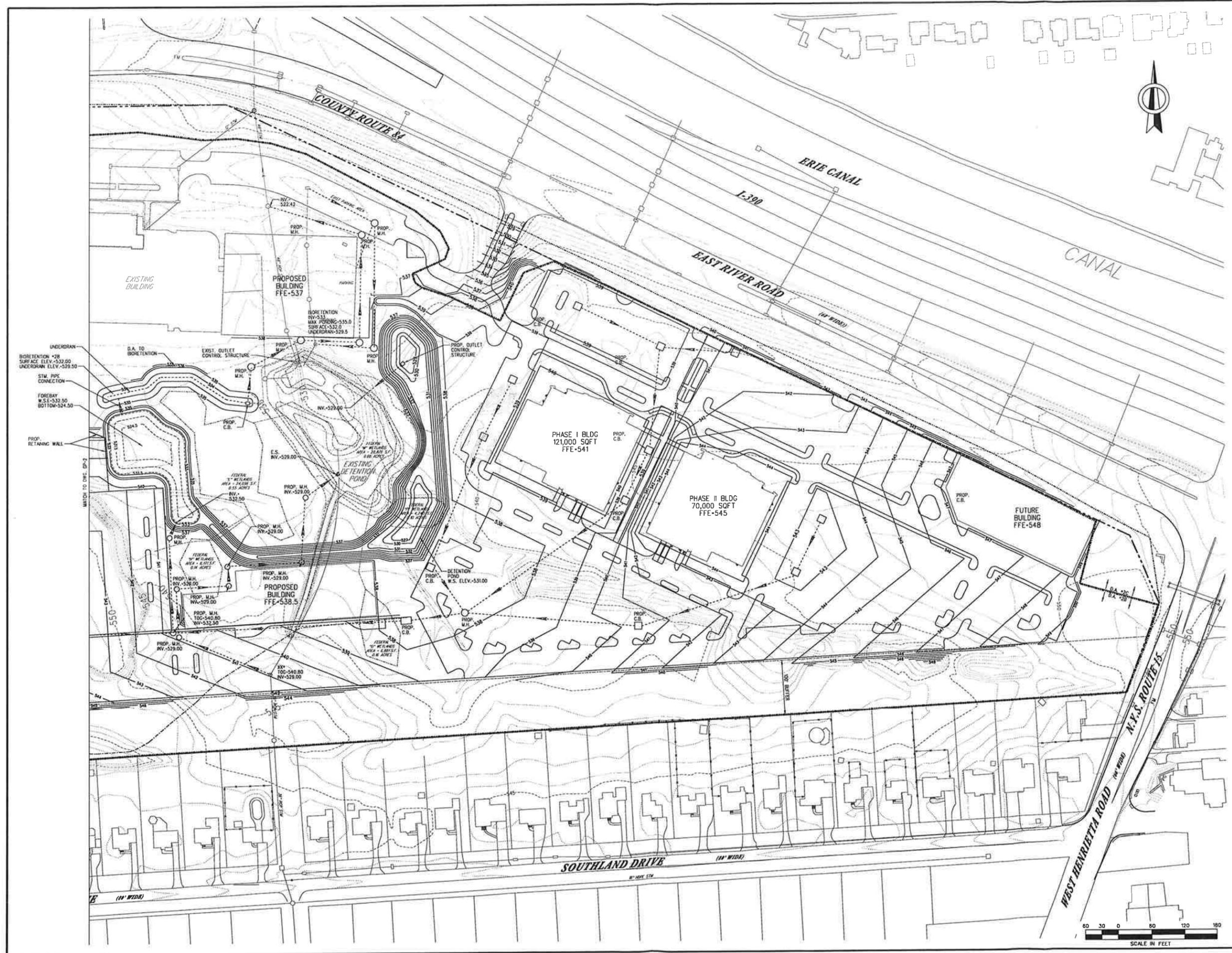
DATE

FYLIN INTERNATIONAL
 255 EAST AVENUE
 ROCHESTER, NY 14604
 (585) 512-2000

CONCEPT GRADING PLAN - 2
 S-DGEIS MAPPING FOR REZONE PROPERTY
 UNIVERSITY OF ROCHESTER

PROJECT NO. 43.2398.01
 DATE: 12/12/13
 SCALE: 1"=60'
 DRAWING NO. GP-2
 SHEET NO. 2 of 5





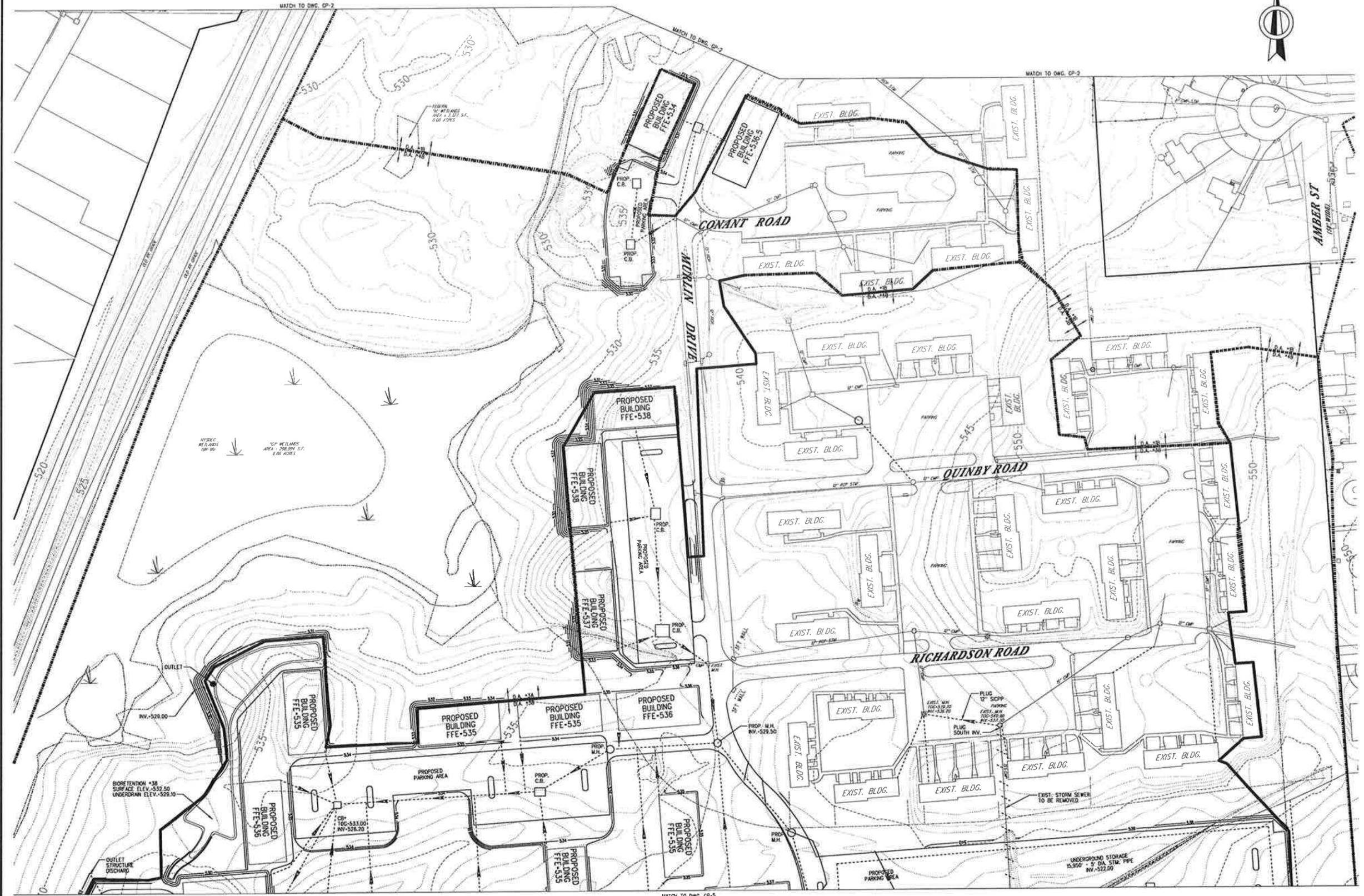
DATE	BY	NO.	REVISIONS

DATE

TYLINT INTERNATIONAL
 255 EAST AVENUE
 ROCHESTER, NY 14604
 (585) 532-2000

CONCEPT GRADING PLAN - 2
 S-DIGES MAPING FOR REZONE PROPERTY
 UNIVERSITY OF ROCHESTER
 251 EAST RIVER ROAD ROCHESTER, NY 14627

PROJECT NO. 43.2398.01
 DATE 12/12/13
 SCALE 1"=60'
 DRAWING NO. GP-3
 SHEET NO. 3 of 5



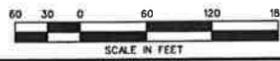
NO.	DATE	DESCRIPTION	BY
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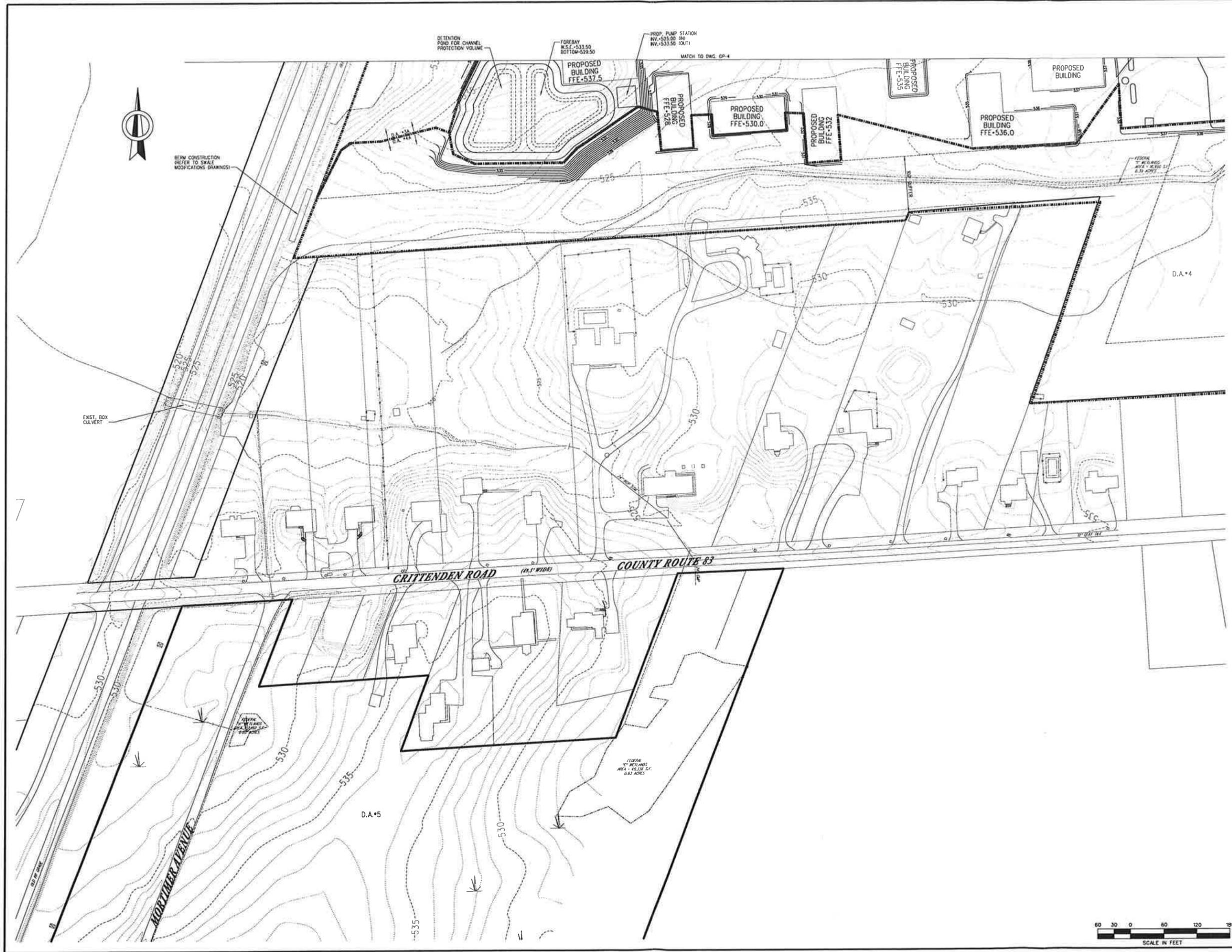
DATE

TYLINT INTERNATIONAL
 255 EAST AVENUE
 ROCHESTER, NY 14604
 (585) 512-2000

CONCEPT GRADING PLAN - 4
 S-DGEIS MAPPING FOR REZONE PROPERTY
 UNIVERSITY OF ROCHESTER
 271 EAST AVENUE ROAD ROCHESTER, NY 14607

PROJECT NO. 43.2398.01
 DATE 12/12/13
 SCALE 1"=60'
 DRAWING NO. GP-4
 SHEET NO. 4 of 5



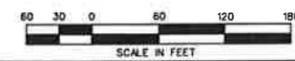


DATE	BY	CHKD.	APP'D.

TYLINT INTERNATIONAL
 255 EAST AVENUE
 ROCHESTER, NY 14604
 (585) 512-2000

CONCEPT GRADING PLAN - 5
 PROJECT NAME: S-06615 MAPPING FOR REZONE PROPERTY
 CLIENT: UNIVERSITY OF ROCHESTER
 ADDRESS: 271 EAST BYRER ROAD, ROCHESTER, NY 14627

PROJECT NO: 43.2398.01
 DATE: 12/12/13
 SCALE: 1"=60'
 DRAWING NO: GP-5
 SHEET NO: 5 of 5



Section _____ South Campus IPD

A. Property Description

The South Campus IPD consists of approximately 180 acres of land in the Town of Brighton currently owned by the University of Rochester (the “University”) which land is bounded on the north by Interstate Route 390, on the west by the former Lehigh Valley Railroad right-of-way (now the Lehigh Valley Trail), on the east by West Henrietta Road, and on the south by Southland Drive and Crittenden Road (the “South Campus”, also referred to herein as the “Property”, which is depicted in the series of supporting graphics included as Exhibit A.

B. Goals and Objectives

The South Campus IPD will comply with all regulations and standards applicable to Institutional Planned Development Districts contained in § 203-134, et.seq. of the Town of Brighton Comprehensive Development Regulations (“CDR”), and the bulk regulations set forth in CDR § 205-9, except as modified hereby.

The South Campus IPD is consistent with and furthers the goals of the Town of Brighton’s Comprehensive Plan 2000 which recommended rezoning a significant portion of the South Campus to IPD, to be used for institutional uses compatible with the existing University facilities.

The South Campus IPD will serve a Town public purpose and a regional public purpose, i.e., allowing the University to develop additional institutional facilities to enhance its status as a world class educational, medical and research institution. Additionally, the South Campus IPD presents economic and social benefits to the Town and its citizens, including, but not limited to, increased revenues and employment, and the donation to the Town of a large parcel of land for Town-wide recreational enjoyment.

C. Permitted Uses

Permitted uses in the South Campus IPD shall be as currently set forth in CDR § 203-135, to wit: Universities and colleges; medical and health-related facilities, such as skilled nursing facilities, acute-care facilities, health-related care facilities and other elderly-care complexes; and support uses which are owned, operated or leased by or otherwise controlled by the University.

D. Guidelines for Future Development in the South Campus IPD

1. New Development and FAR
 - (a) Maximum New Development: The South Campus IPD contemplates a maximum of approximately 1,766,450 gross square feet of additional development (“New Development”) which will fall generally into two categories:

(1) Office/Research/Clinical uses located in the northern portion of the IPD (north of the parcel boundary line which parallels Southland Drive) with a total development area of 1,290,050 gross square feet; and

(2) Housing located in the central and southern portions of the IPD (south of the parcel boundary line which parallels Southland Drive) with a total development area of 476,400 gross square feet.

The South Campus Concept Plan was prepared as part of the University Campus Master Plan, which was adopted by the University in 2009. See the attached site plans for additional information and graphic depictions of the concept plan (see Exhibit A).

It is anticipated that the New Development will take place over a period of 25 years or more.

(c) Total Development: Total development will not exceed 2,535,812 gross square feet (approximately 769,362 gross square feet of existing development plus 1,766,450 gross square feet of New Development).

(d) FAR: The maximum overall South Campus (existing plus New Development) density equals approximately 15,850 gross square feet of floor area per acre (for a floor area ratio ("FAR") of 0.36).

This has been calculated based on the site area of 180 acres, less 20 acres of wetlands/wetland buffer, divided by 2,535,812 gross square feet of development: $2,535,812 \text{ GSF} / 160 \text{ acres} = 15,849 \text{ GSF/acre}$.

2. Buildout Limitations

(a) Traffic

The Town and the University acknowledge that the New York State Department of Transportation ("NYSDOT") is engaging in area-wide traffic network improvements to the I-390/West Henrietta Road and East Henrietta Road corridors at this time. New off/ramps/on-ramps between I-390 and East River Road at the northern portion of the IPD site have been completed, and the Kendrick Road Bridge is currently in the process of being widened. As the Master Plan is built out in phases, additional traffic improvements may be required, such as the addition of traffic signals and/or road widening, and will be determined ahead of the construction for each phase in order to avoid adverse impacts to congestion and driver delay.

Additionally, for any New Development which is proposed before the NYSDOT planned improvements listed below have been completed, the University shall cause the preparation of an additional traffic impact analysis to demonstrate that there is no significant increase to driver delay or significant deterioration of level of service ("LOS") at the following intersections:

- West Henrietta Road at I-390 North Bound Ramp
- West Henrietta Road at East River Road
- East Henrietta Road at I-390 North Bound Ramp
- East Henrietta Road at I-390 South Bound Ramp

(b) Sanitary Sewer

Based on the available data, calculations, and discussions with the Town and Monroe County Pure Waters, there is capacity available in the existing sanitary sewer system for the New Development to discharge wastewater into the system. To confirm the existing sanitary flow rates and reserve capacity of the Town's sewer system, prior to submitting application for any proposed New Development, the University will place monitors in the sewers to determine the actual flow rates and available capacity.

E. Bulk Regulations

Bulk regulations for the South Campus IPD shall be as set forth in CDR § 205-9 except to the extent such regulations are modified below:

1. Building Height

(a) Maximum Height of Office/Research/Clinical structures shall be as follows:

1. In the site area north of East River Road, a maximum building height of 90 feet.
2. In the site area south of East River Road and 250 feet north of the property boundary parallel to Southland Drive from W Henrietta Rd to the western corner and 250 feet west of the Southland Drive property boundary west corner along the line of the Southland Drive property boundary to Lehigh Valley Trail property boundary, a maximum building height of 75 feet.
3. In the zone 250 feet north and 250 feet west of the property boundary parallel to Southland Drive, a maximum building height of 60 feet.
4. In the site area south of the property boundary parallel with Southland Drive, which is proposed to be developed for residential use, a building height of 50 feet to the eaves and 60 feet maximum, (including rooflines).

See graphic in Exhibit A for depiction of the maximum building height zones.

2. Density

- (a) Maximum building square footage for the entire South Campus shall be approximately 2,535,812 (approximately 769,362 square feet of existing development plus 1,766,450 square feet of New Development. The developable site area is 160 acres, which includes subtraction of 20 acres of wetlands and 100 foot wetland buffers from the overall site area of 180 acres. Density of the South Campus development shall be 15,849 gross square feet per acre.

F. Development in Woodlot EPOD areas

New Development taking place in areas of the South Campus IPD identified as Woodlot EPODs shall comply with woodlot EPOD regulations and shall be subject to the following:

- (a) To the maximum extent practicable, any New Development occurring within Woodlot EPODs shall preserve that section of the Woodlot serving as a screening buffer to residential areas; and
- (b) All work within areas determined to be Woodlot EPODs on the South Campus shall comply with the soil erosion and sedimentation limitation practices set forth in CDR § 203-125 (B)(1)-(6) as currently written.

G. Landscaping and Buffering

1. Landscaping: Landscaping in the South Campus IPD will conform to the requirements of the Town of Brighton code.
2. Landscape Buffering: Landscape buffering from the borders of the South Campus IPD where it abuts residential districts and the Town Trail shall be at least 100 feet. Landscape buffering will consist of infill planting to further limit views of the New Development from neighboring residential properties.

H. Roads, Parking and Loading

1. The University will eliminate an access right of way from the South Campus to Crittenden Road. An emergency access route will be provided from the southern portion of South Campus to Crittenden Road, which will be located adjacent to the Town Trail.
2. Off-Street Parking and Loading: Off-street parking and loading shall comply with the requirements of CDR § 203-139 as currently written.

I. Signs

New signs in the South Campus IPD will comply with such Signage Plan as is approved by the Town.

J. Review and Legal Process

1. Incremental Development: Except as described below, all Permitted Uses as described in CDR § 203-135 and set forth above in Section ____.C, and in the South Campus IPD shall be deemed to be “incremental development” in accordance with CDR § 203-142(B), and may be undertaken without amendment of the current plan, subject only to site plan approval by the Planning Board pursuant to CDR Article III or a successor provision.
2. “Wet lab” research (as defined herein), design and development laboratories and prototype or pilot processing, development or assembly activities shall require site plan approval and conditional use approval by the Planning Board if proposed to be located within 200 feet of the following borders of the South Campus:
 - (a) The southern border of the South Campus having a common property line with the rear line of the properties fronting on the north side of Southland Drive;
 - (b) The eastern border of the South Campus having a common property line with the side or rear line of the properties at the west end of Southland Drive, Doncaster Road or Furlong Road; and
 - (c) The southern border of the South Campus having a common property line with the rear line of properties fronting on the north side of Crittenden Road.

For purposes of the South Campus IPD, “wet laboratories” shall mean those laboratories utilizing biological, radioisotope, and high hazard chemical/solvent on a daily basis. Examples include most chemistry, biomedical and microbiological labs. These facilities require fume hoods and specialty equipment, depending on the type of research being conducted, to ensure employee safety. Additionally, higher general ventilation is supplied to these locations.

3. Outdoor stadiums or arenas shall require site plan approval and conditional use approval by the Planning Board.
4. New Development shall conform to, and the South Campus IPD District will be subject to, the Performance Standards for the Technology and Office Park District as set forth in CDR Article XXII or a successor provision.



UNIVERSITY *of*
ROCHESTER

EXHIBIT A
South Campus IPD Conceptual Plan

January 28, 2014

Table of Contents

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Existing Campus and Master Plan	1
Conceptual Plan Purpose	2
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Required Buffers and Setbacks	5
Illustrative Plan	6
Potential Development	7
Potential Use Zones	8
Maximum Allowable Building Heights	9
Potential Development Plan	10
Potential Transit Routes	11
Potential Bicycle Paths or Routes	12
Potential Pedestrian Network	13
Overall Property Plan	14

University of Rochester

South Campus IPD Conceptual Plan

Existing Campus and Master Plan



River Campus

Mt. Hope
Mixed Use
Development

Medical Center

Mid Campus

South Camp



Existing Campus 2008

1/28/2014

University of Rochester Campus IPD Conceptual Plan Update 2014

Conceptual Plan Purpose

The IPD Conceptual Plan conceptually defines the following:

1. Required minimum setbacks and buffers
2. Preservation of conservation zones and conceptual open space network
3. Conceptual site layout for illustration – actual layout will be reviewed at future building design stage
4. Minimum distance between adjacent buildings
5. Conceptual storm water management
6. Potential site uses
7. Allowable maximum building heights by zones
8. Potential site capacity in overall building gross square footage across the entire South Campus zone
9. Parking ratios by building use calculated across the entire South Campus zone
10. Conceptual site circulation consisting of roads, sidewalks, bicycle access, and transit access

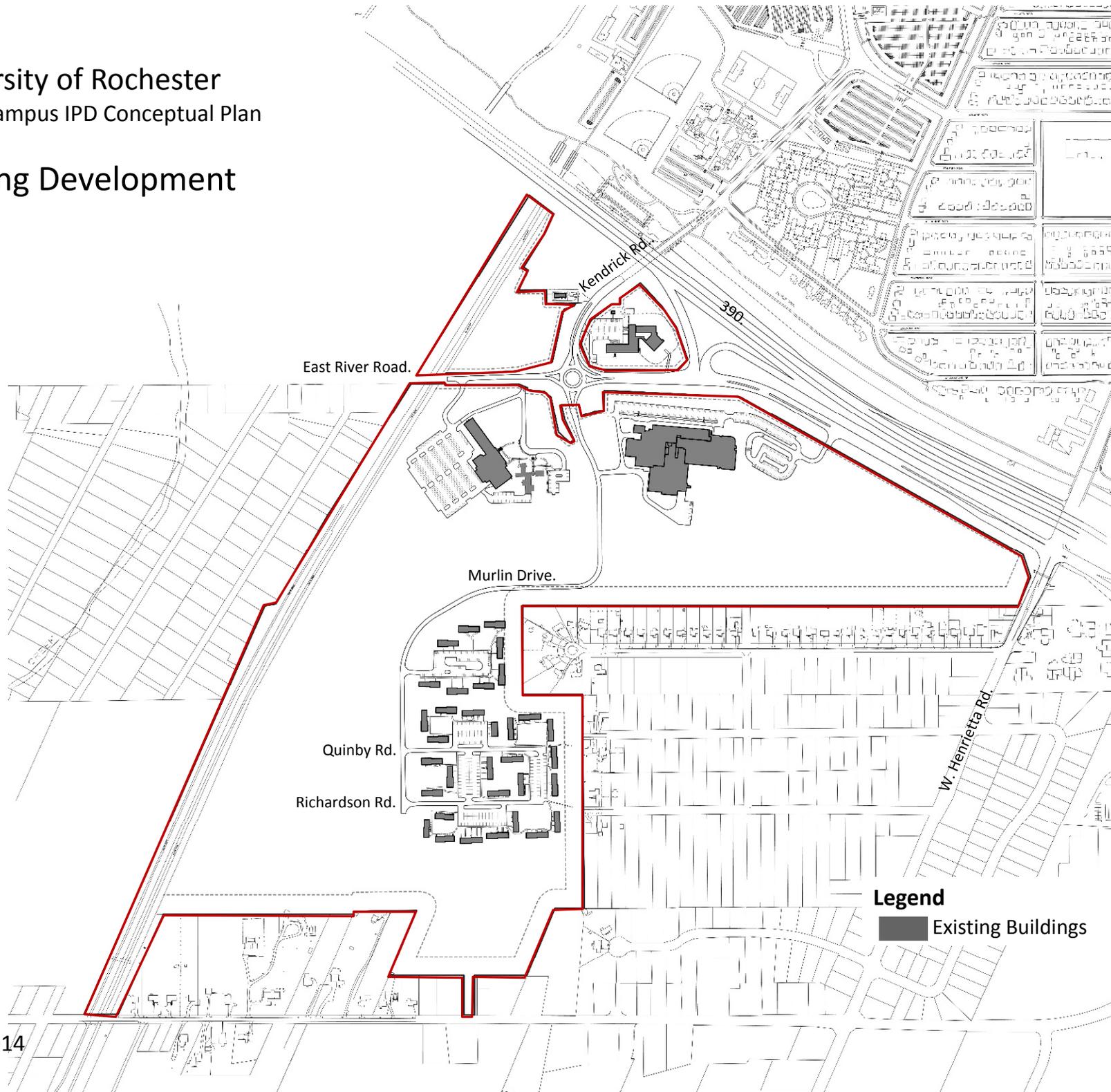
University of Rochester
South Campus IPD Conceptual Plan

South Campus Aerial View

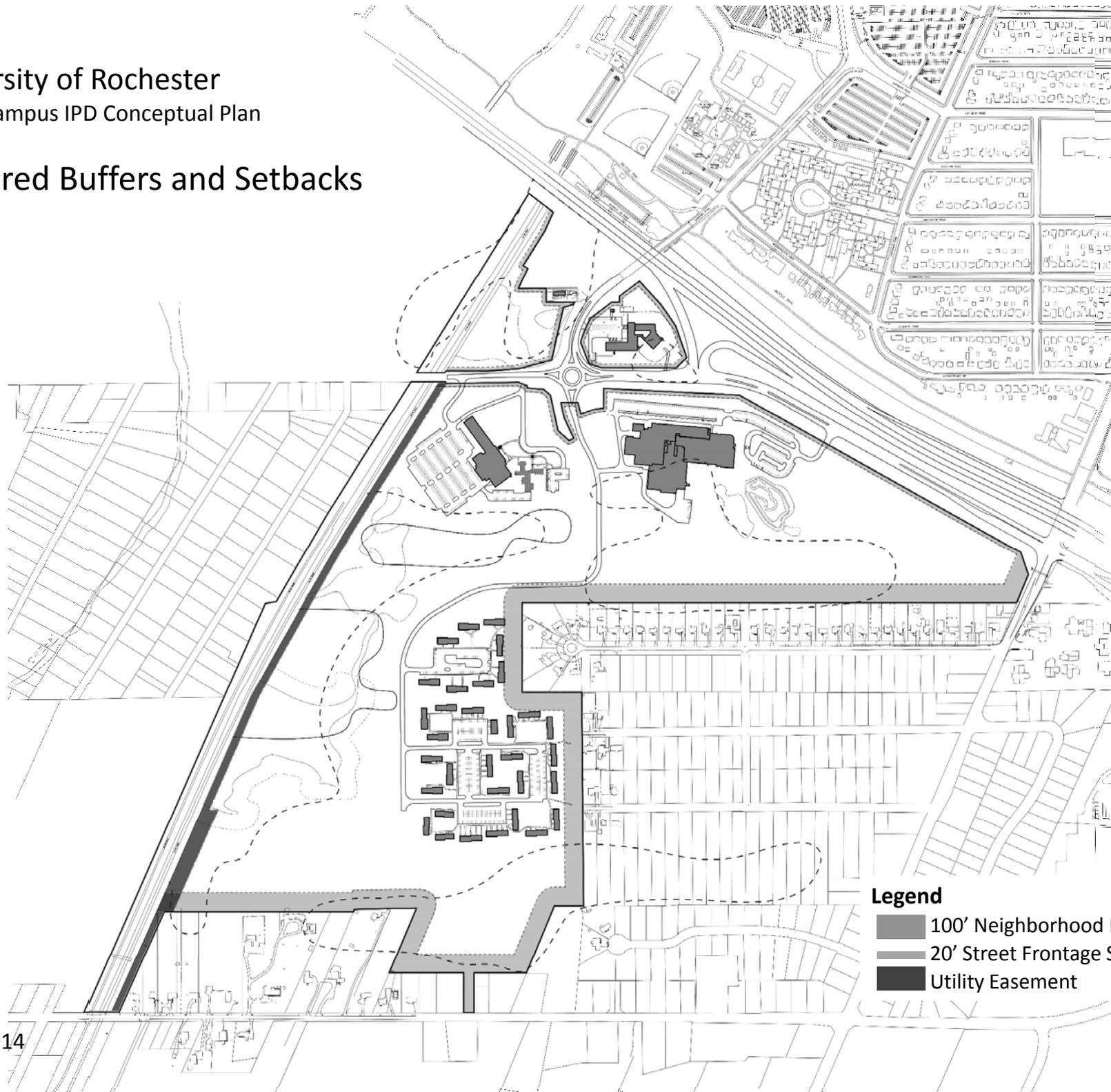


University of Rochester
South Campus IPD Conceptual Plan

Existing Development



Required Buffers and Setbacks



University of Rochester

South Campus IPD Conceptual Plan

Illustrative Plan

NOTE: The dimensional limitations showing heights and number of building stories are intended to be maximums (as is the overall aggregate square footage of the total development) for planning and regulatory purposes. Any particular building, however, may be shorter and/or contain fewer stories than as set forth in this submission or as permitted by the IPD.”



University of Rochester

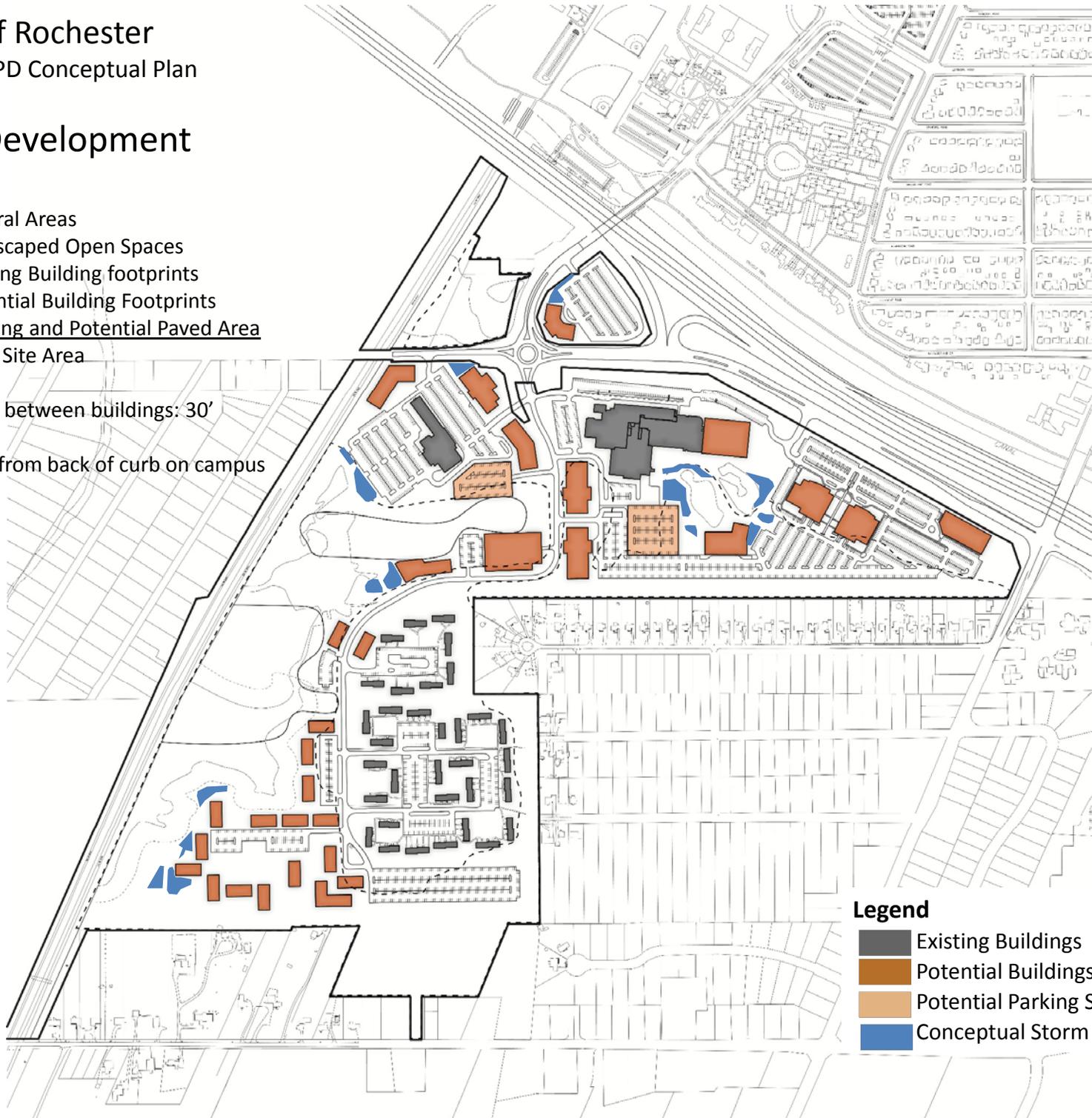
South Campus IPD Conceptual Plan

Potential Development

90 Acres	Natural Areas
36 Acres	Landscaped Open Spaces
5.6 Acres	Existing Building footprints
10.5 Acres	Potential Building Footprints
<u>37.9 Acres</u>	<u>Existing and Potential Paved Area</u>
180 Acres	Total Site Area

Minimum distance between buildings: 30'

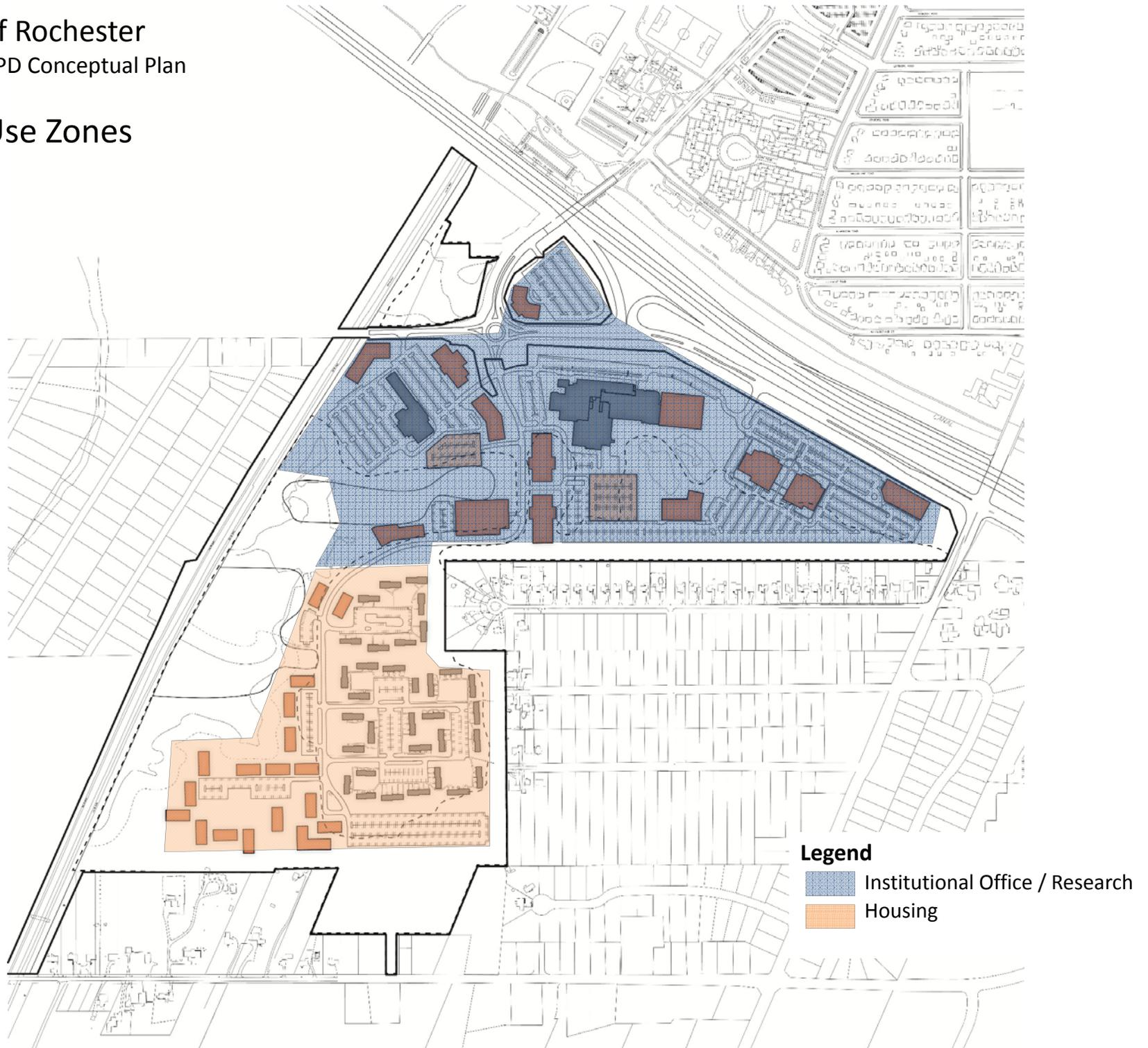
Minimum setback from back of curb on campus streets: 15'



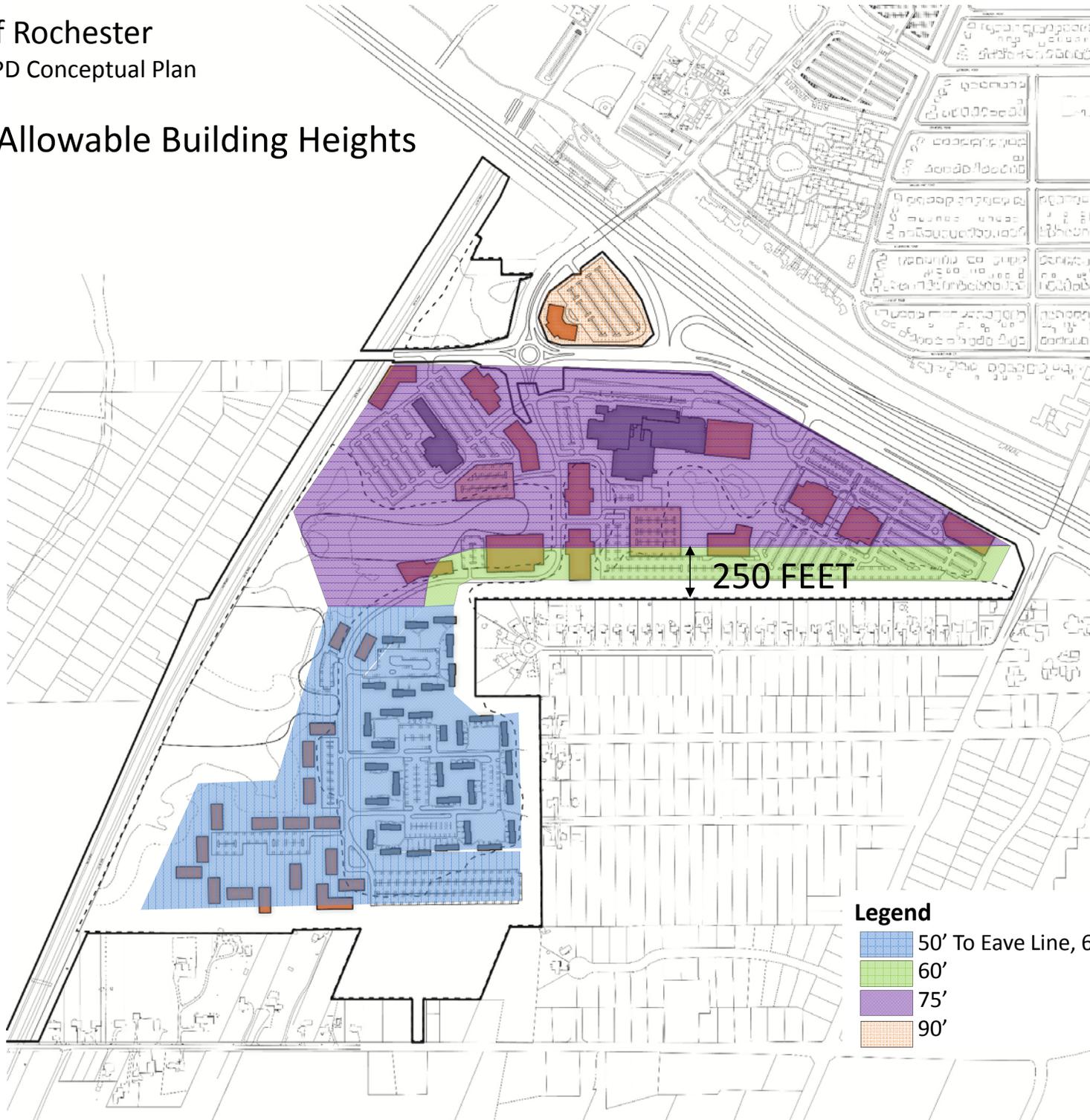
Legend

- Existing Buildings
- Potential Buildings
- Potential Parking Structures
- Conceptual Storm Water Management

Potential Use Zones

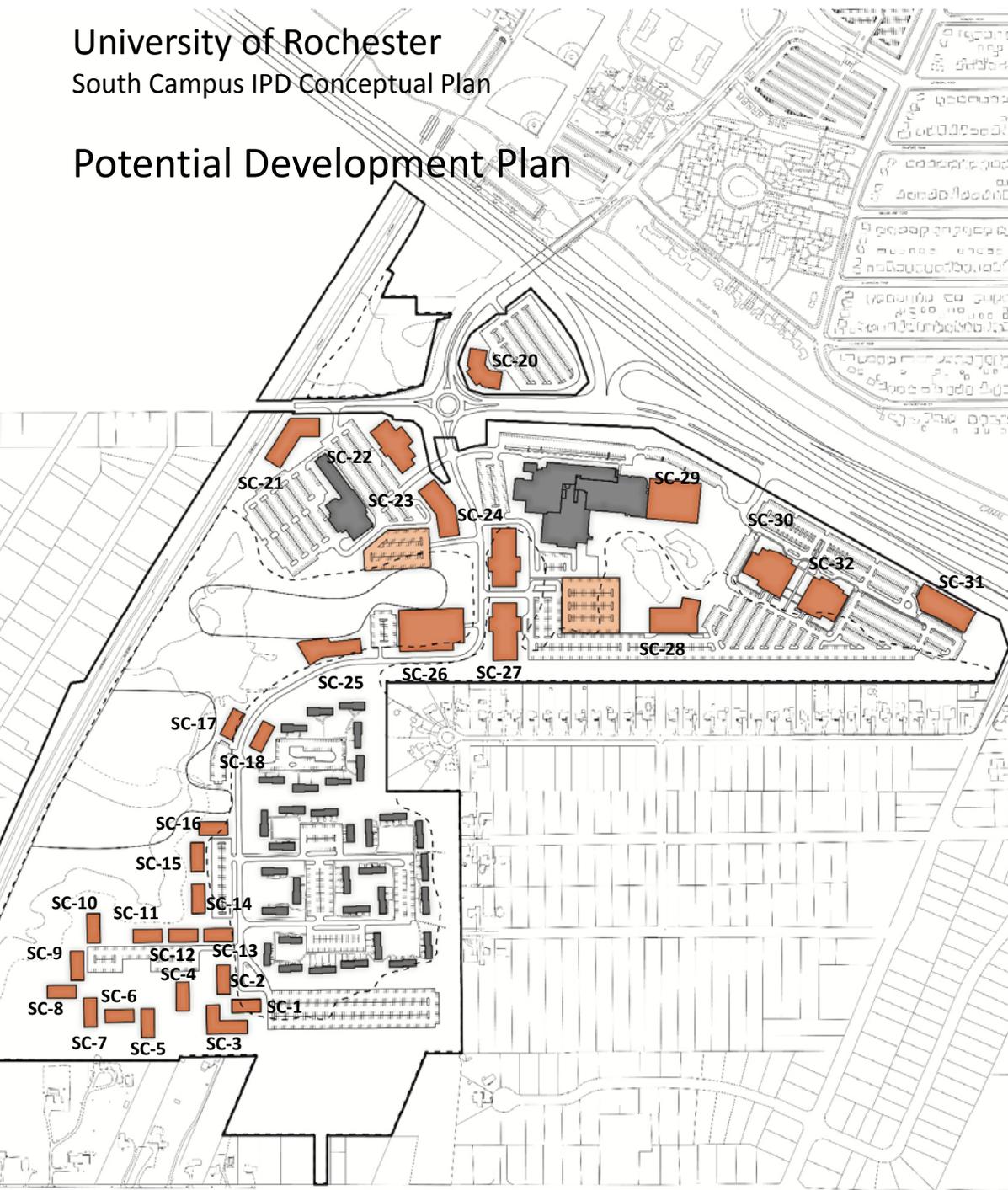


Maximum Allowable Building Heights



University of Rochester
South Campus IPD Conceptual Plan

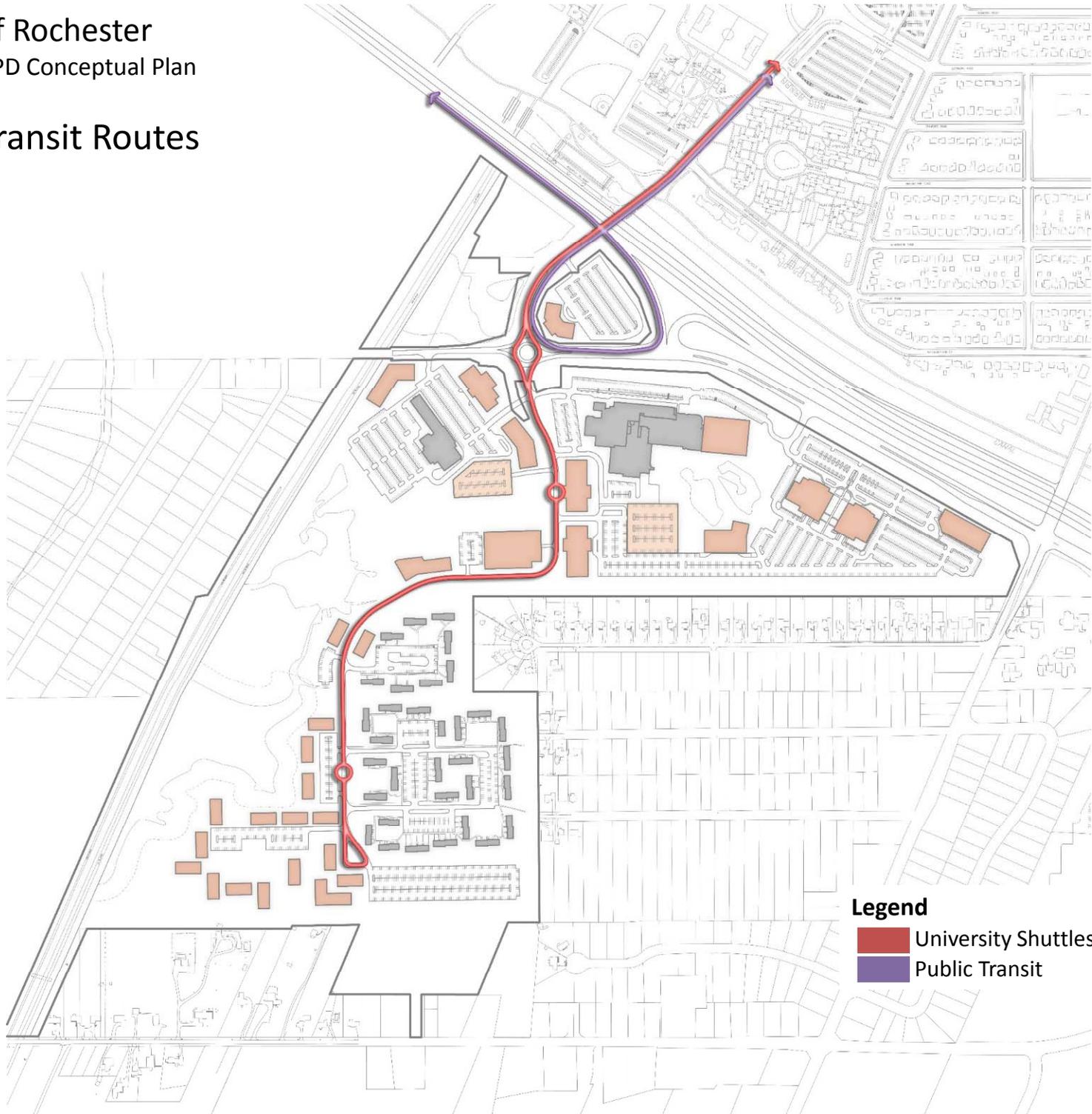
Potential Development Plan



POTENTIAL DEVELOPMENT PLAN						
Plan #	Footprint		Total GSF	Building Use	Parking Ratio Planned	
	Area	No. of floors			/ 1,000 GSF	Parking
EXISTING BUILDINGS						
Institutional Buildings			474,650	Office/ Research	Existing	
South Campus Housing			338,600	Housing	Existing	
Buildings to be removed long term			43,888			
NET EXISTING BUILDINGS			769,362			
PROPOSED BUILDINGS						
SC-1	6,000	4	24,000	Housing	1.67	40
SC-2	6,000	4	24,000	Housing	1.67	40
SC-3	11,600	4	46,400	Housing	1.67	77
SC-4	6,000	4	24,000	Housing	1.67	40
SC-5	6,000	4	24,000	Housing	1.67	40
SC-6	6,000	4	24,000	Housing	1.67	40
SC-7	6,000	4	24,000	Housing	1.67	40
SC-8	6,000	4	24,000	Housing	1.67	40
SC-9	6,000	4	24,000	Housing	1.67	40
SC-10	11,500	4	46,000	Housing	1.67	77
SC-11	6,000	4	24,000	Housing	1.67	40
SC-12	6,000	4	24,000	Housing	1.67	40
SC-13	6,000	4	24,000	Housing	1.67	40
SC-14	6,000	4	24,000	Housing	1.67	40
SC-15	6,000	4	24,000	Housing	1.67	40
SC-16	6,000	4	24,000	Housing	1.67	40
SC-17	6,000	4	24,000	Housing	1.67	40
SC-18	6,000	4	24,000	Housing	1.67	40
SUBTOTALS			476,400	794		
SC-20	25,000	5	125,000	Office/ Research	3.33	416
SC-21	25,000	4	100,000	Office/ Research	3.33	333
SC-22	25,000	5	125,000	Office/ Research	3.33	416
SC-23	25,000	4	100,000	Office/ Research	3.33	333
SC-24	25,000	4	100,000	Office/ Research	3.33	333
SC-25	25,000	4	100,000	Office/ Research	3.33	333
SC-26	25,000	4	100,000	Office/ Research	3.33	333
SC-27	25,000	4	100,000	Office/ Research	3.33	333
SC-28	25,000	4	100,000	Office/ Research	3.33	333
SC-29	20,000	1	20,000	Office/ Research	3.33	67
SC-30	35,013	4	140,050	Office/ Research	6	840
SC-31	35,000	3	105,000	Office/ Research	6	630
SC-32	25,000	3	75,000	Office/ Research	6	450
SUBTOTALS			1,290,050	5,150		
TOTAL SOUTH CAMPUS			2,535,812 GSF	5,944		
SITE GROSS AREA			7,840,800 GSF			
FLOOR AREA RATIO			0.32			

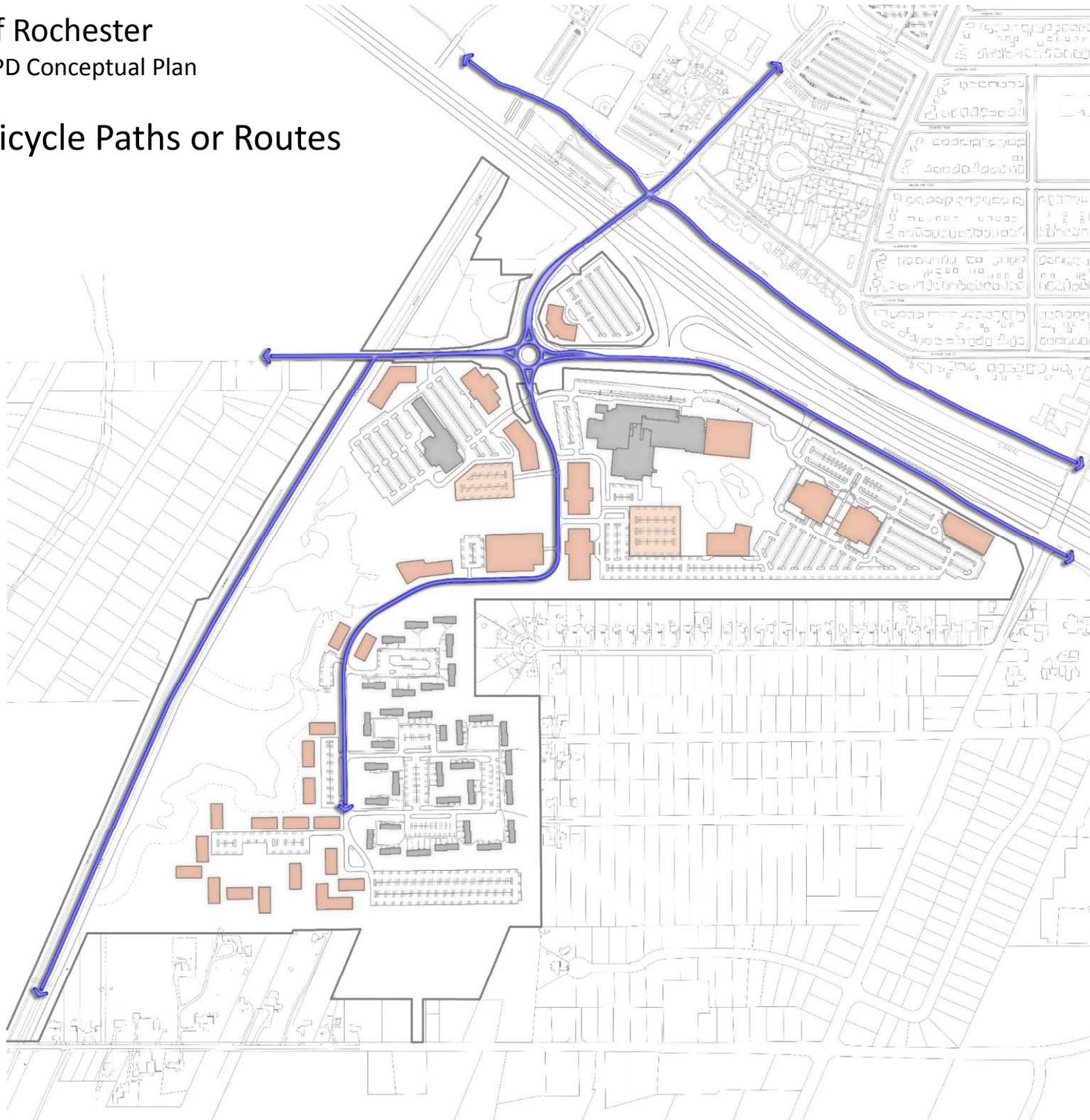
University of Rochester
South Campus IPD Conceptual Plan

Potential Transit Routes



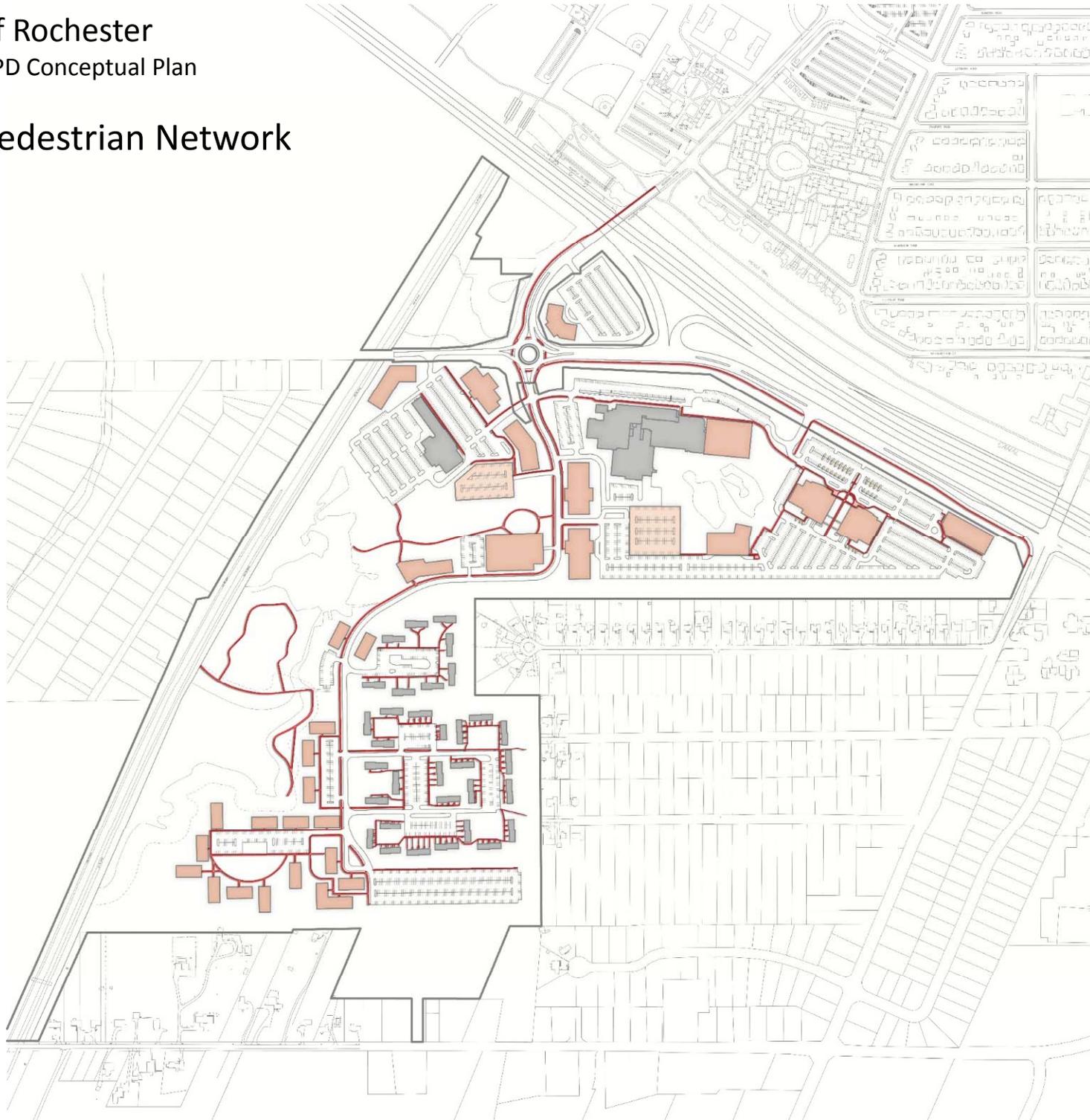
University of Rochester
South Campus IPD Conceptual Plan

Potential Bicycle Paths or Routes



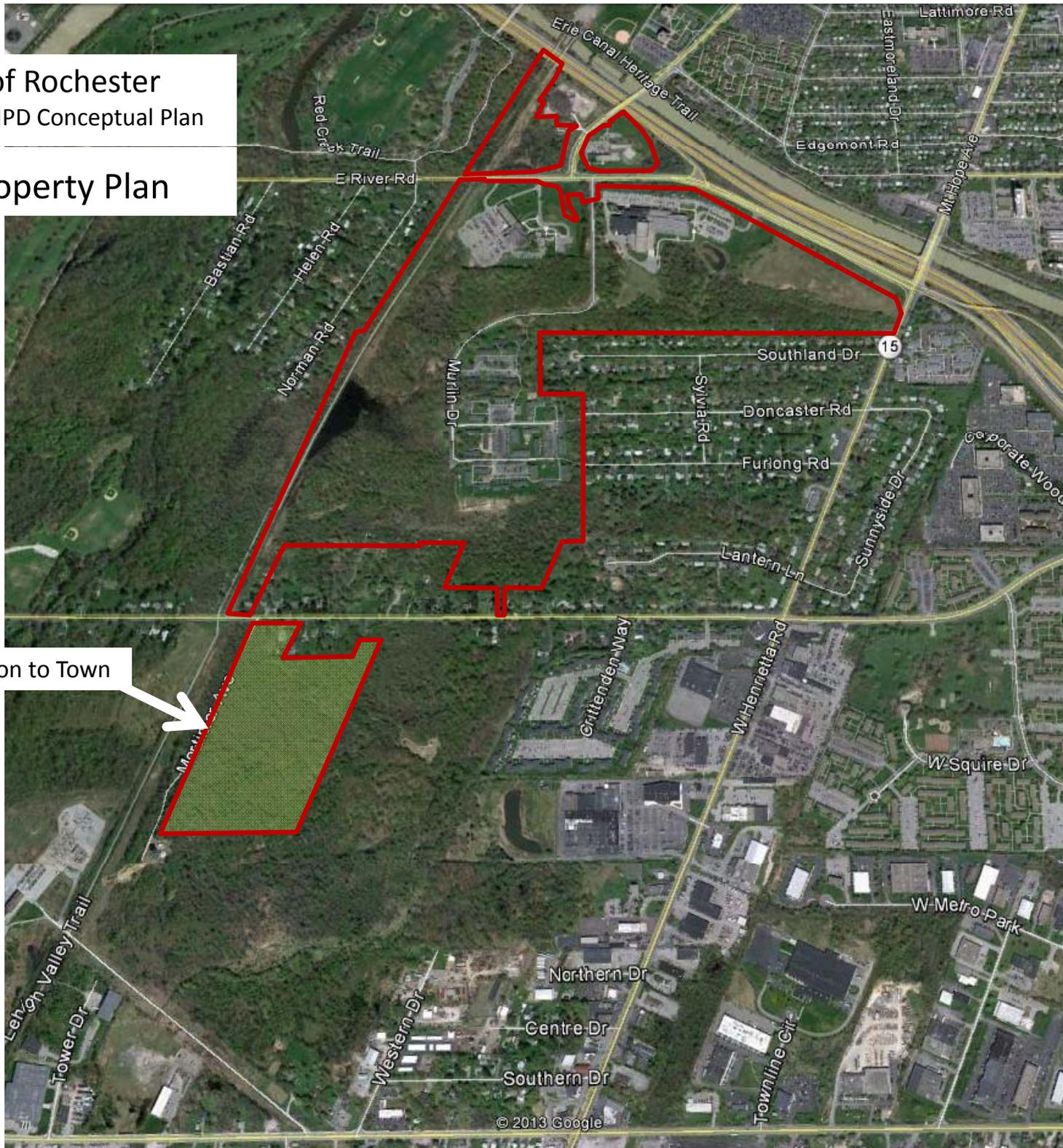
University of Rochester
South Campus IPD Conceptual Plan

Potential Pedestrian Network



University of Rochester
South Campus IPD Conceptual Plan

Overall Property Plan



Land Donation to Town