Corridor Traffic Review Report

East River Road – Erie Station Road to Jefferson Road

Town of Henrietta, Monroe County NY

April 2018

Stantec

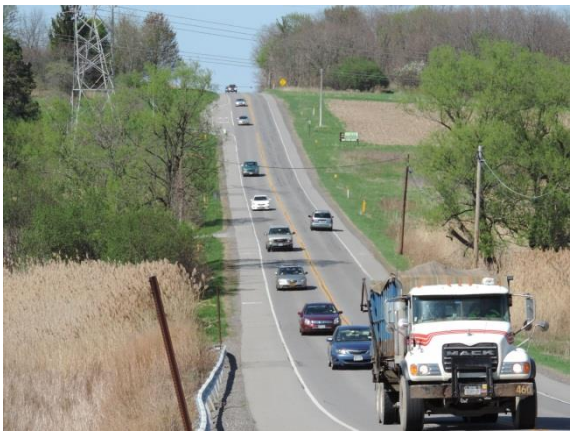
This Page Intentionally Left Blank

CORRIDOR TRAFFIC REVIEW REPORT

TABLE OF CONTENTS

APPENDICES

INTRODUCTION



As times have changed, so has East River Road. In years past, this winding 2-lane road (County Road 84), making its way through the fields and woods in the Town of Henrietta, was very rural in character. But with anticipated economic development the character of the East River Road corridor is beginning to transform.

As one moves through the East River Road corridor from north to south, you see clear evidence of this growth. At the north end for example, there is the Rochester Institute of Technology (RIT), which has become a nationally renowned college that has seen great expansion, and thus is a driving force of the Greater Rochester economy. Recent additions include the Gordon Field House, and the Golisano Institute of Sustainability building, which is visible from East River Road. Continuing in a southerly direction, land uses along and adjacent to East River Road are primarily residential, with a few exceptions (e.g. RIT Business & Technology Park on Lucius Gordon Drive, vacant Kodak Riverwood campus near the intersection of Lehigh Station Road and East River Road, and minor commercial establishments).

East River Road is a key north south link in the overall transportation network servicing the area. This facility is experiencing increased vehicle traffic, along with bicycle and pedestrian traffic, from the development that is taking place immediately within the corridor, as well as beyond the study area.

The Town of Henrietta, in conjunction with the Monroe County Department of Transportation and RIT, commenced completion of a corridor traffic analysis in order to define current and future traffic conditions. The purpose of this study is to define potential traffic impacts and identify any operational deficiencies over the next 20 years to assist the Town and County in planning for future roadway improvements as growth and surrounding development occur.

This study looked at the section of East River Road from Erie Station Road to Jefferson Road which is 3.8 miles in length and includes six (6) major intersections. The analysis focused on the operations at these intersections and any impacts to linear capacity for the roadway segments in between. See Figures 1 and 2 for County and Town location maps.

The Town provided future development scenarios to predict future traffic volumes which combined with existing traffic volumes were used to investigate the current configuration and performance of the corridor as well as the future anticipated conditions. The East River Road Traffic Review project has three primary goals:

1) Develop future traffic volumes for years 2020, 2025, 2030 and 2035, which will be established using existing volumes, background growth and anticipated corridor development,
2) Creating infrastructure conceptual alternatives to accommodate future growth, and
3) Providing a framework for identifying potential equitable infrastructure funding shares, based on traffic volumes, for the County, Town and private developers.

The following sections outline the steps taken to achieve the project goals.

PROJECT LOCATION

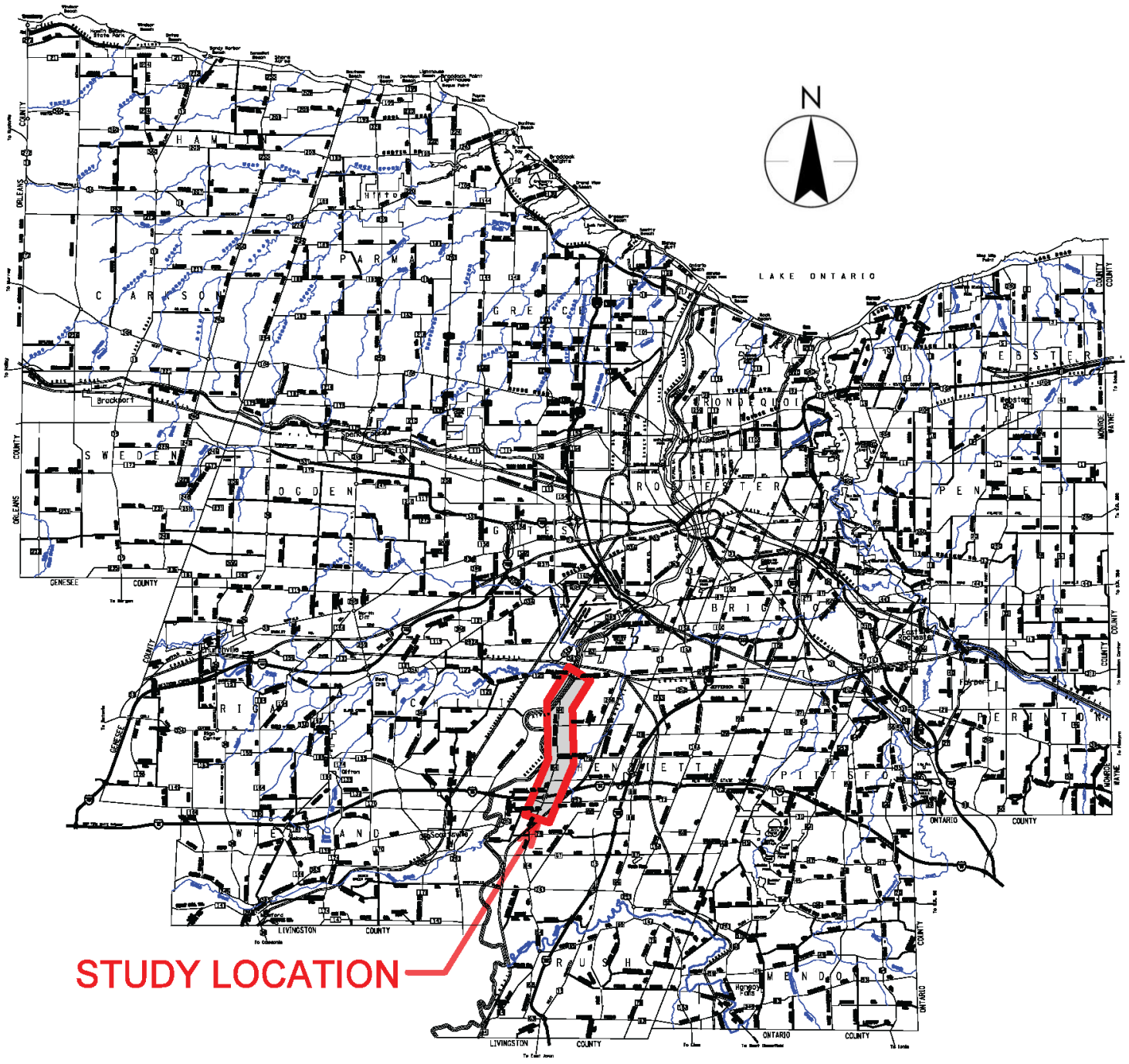


Figure 1 - County Map

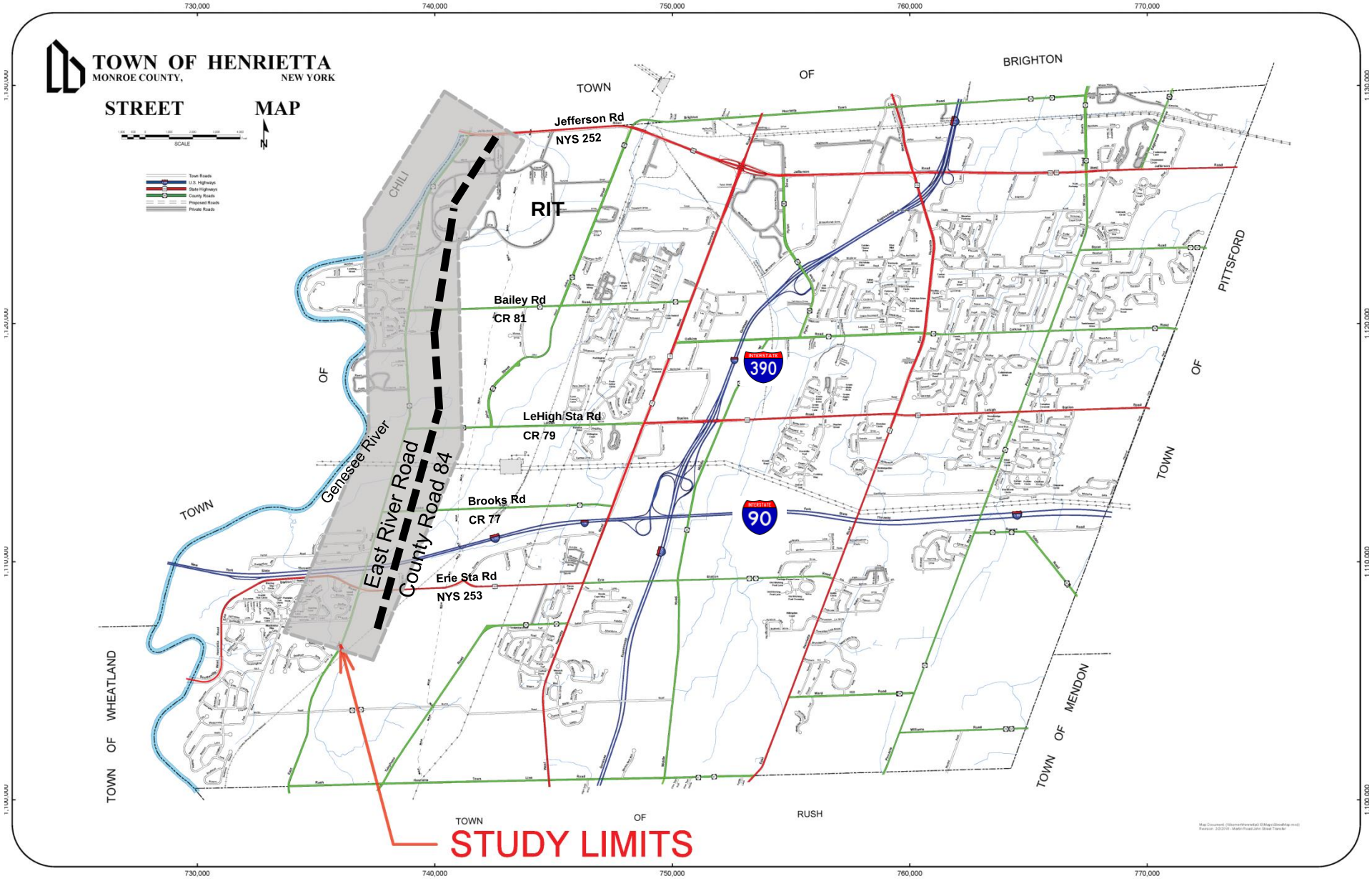


Figure 2 - Town Local Map

1 - EXISTING CONDITIONS

The East River Road (County Road 84) corridor is located in the Town of Henrietta, New York with the study area extending from Erie Station Road to the South to Jefferson Road to the North. A total of six (6) intersections are located within the project corridor:

1. Erie Station Road (NYS 253) at East River Road (CR 84) – NYSDOT Jurisdiction
2. Brooks Road (CR 77) at East River Road (CR 84) – MCDOT
3. Lehigh Station Road (CR 79) at East River Road (CR 84) – MCDOT
4. Bailey Road (CR 81)/Chesapeake Landing at East River Road (CR 84) - MCDOT
5. River Meadow/Farnum Lane (RIT) at East River Road (CR 84) - MCDOT
6. Jefferson Road (NYS 252) at East River Road (CR 84) – NYSDOT

1.1 Existing Corridor

The East River Road corridor is a north/south urban minor arterial roadway under the jurisdiction of the Monroe County Department of Transportation. The corridor is primarily a 2-lane roadway with turn lanes at some of the intersections and some short segments with multiple lanes. Excluding auxiliary lanes at the intersections the following segments contain more than two (2) travel lanes:

- Two (2) southbound lanes south of Jefferson Road for a distance of approximately 600'.
- Two-Way Center Turn Lane (TWCTL) between Still Pond Way/Lucius Gordon Drive and Chesapeake Landing/Bailey Road for a distance of approximately 900'.

The terrain within the corridor includes rolling hills and becomes more rural south of the Chesapeake Landing/Bailey Road intersection. The northern segment contains a large number of residential and commercial driveways north of Bailey Road. East River Road is adjacent to the Genesee River at the northern end of the study area. The posted speed limit within the study corridor is 40 miles per hour.

1.2 Existing Intersections

The following intersections (from South to North) are located within the study limits and will be part of the capacity analysis:

East River Road (CR 84) at Erie Station Road (NYS 253) – Is a four-way signalized intersection under the jurisdiction of NYSDOT located just south of the bridge over the Thruway. The Northbound East River Road approach is a single lane with a widened right shoulder. The southbound approach has two lanes beginning 200' from the intersection which merge into a single lane just south of the intersection. The Erie Station Road approaches include two lanes in each direction which merge to one lane beyond the intersection in both directions.

East River Road at Brooks Road (CR 77) – Is a three-way stop sign controlled intersection with a stop sign on the Brooks Road approach which is under the jurisdiction of MCDOT. The East River Road and Brooks Road approaches are 2-lanes.

East River Road at Lehigh Station Road (CR 79) – Is a three-way signalized intersection located just south of the former Kodak Riverwood facility main access which is under the jurisdiction of MCDOT. The southbound approach includes a dedicated left turn lane onto Lehigh Station road. The Lehigh Station Road approach provides a dedicated left and right turn lane. This intersection is offset 250' from the former Kodak Riverwood facility northern driveway.

East River Road at Bailey Road/Chesapeake Landing – Is a four-way signalized intersection under the jurisdiction of MCDOT. Northbound and southbound East River Road approaches have dedicated left turn lanes. Bailey Road (westbound) has a dedicated right turn lane and the EB Chesapeake Landing approach is a single lane.

East River Road at Farnum Lane/River Meadow Drive – Is a four-way signalized intersection. Both northbound and southbound approaches of East River Road are a single lane. The eastbound River Meadow drive approach is a single lane and the Farnum Lane (RIT) westbound approach has an additional dedicated right turn lane onto East River Road.

East River Road at Jefferson Road - Is a large four-way signalized intersection which is bordered by the Genesee River to the West. Both northbound and southbound East River Road approaches have dedicated left and right turn lanes onto Jefferson road and one through lane. The eastbound Jefferson Road approach has two through lanes and dedicated left and right turn lanes. The westbound Jefferson Road approach has a dedicated left turn lane and three through lanes, the right most lane becoming dedicated right turn lane onto Scottsville Road.

Pedestrian Accommodations

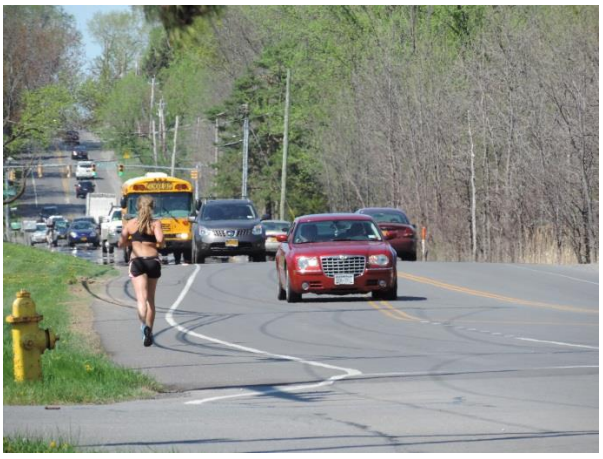
There are no dedicated sidewalks along East River Road within the study area. Pedestrians are currently using the available shoulders. The following residential side streets have sidewalk connections to East River Road:

1. Farrell Road
2. Chesapeake Landing
3. Cape Henry Trail
4. Residential Trail system at the Southwest corner of Erie Station Road

A short Trail segment is also located between East River Road and the Genesee River just south of Jefferson Road. Except for Jefferson Road there are no pedestrian crossings or pedestrian signals at the existing intersections. Pedestrian activity was seen in the corridor primarily north of Bailey Road.

Bicycle Accommodations

Bicyclists use the existing shoulders when traveling within the corridor. Existing shoulder widths vary from 1’ to 10’ with much of the corridor having 5-6’ shoulders.



Pedestrian and Bicycle Users on East River Road

Table 1 – Summary of Mainline Roadway Segments				
Road Segment	**Number of thru Lanes**	**Lane Type**	**Lane Width**	**Shoulder Width**
South of Erie Station Rd.	2	Travel Lane	11’	3’
Erie Station Rd. to Brooks Rd.	2	Travel Lane	11’	NB varies 1’ to 10’ SB varies 1’ to 3’
Brooks Rd. to Lehigh Station Rd.	2	Travel Lane	11’	6’
Lehigh Station Rd. to Bailey Rd./Chesapeake Landing	[1]2	Travel Lane, Center turn lane	11’	NB varies 5’ to 10’ SB varies 3’ to 8’
Bailey Rd./ Chesapeake Landing to River Meadow/Farnum Ln.	2	Travel Lane	11’	5’
Meadow/Farnum Ln. to Jefferson Rd.	2	Travel Lane	11’	Varies 5’ to 6’
North of Jefferson Rd.	2	Travel Lane	11’	6’

[1]A Center Two-Way Left Turn Lane is located between Still Pond Way/Lucius Gordon and Chesapeake/Bailey Road.

Table 2 - East River Road Intersection Characteristics							
Intersecting Road Location	No. Lanes	Lane Type	Lane width	Turn Lane length	Shoulder width	Edge Treatment	Control Feature
Erie Station Road							
East River Road - North	3	2 SB travel lane, 1 NB travel lane	11'	315'	1'	none	Signal
East River Road - South	2	1 travel lane each direction	11'	-	11' NB, 6' SB	none	
Erie Station Road - East	3	2 WB travel lanes, 1 EB travel lane	11'	100'	3'	none	
Erie Station Road - West	4	2 travel lanes each direction	11'	350'	1'	gutter	
Brooks Road							
East River Road - North	2	1 travel lane each direction	11'	-	3'	none	Stop Sign
East River Road - South	2	1 travel lane each direction	11'	-	1'	none	
Brooks Road - East	2	1 travel lane each direction	11'	-	1'	none	
Lehigh Station Road							
East River Road - North	3	1 SB dedicated left turn lane, 1 travel lane each direction	11'	100'	6' NB, 3' SB	none	Signal
East River Road - South	2	1 travel lane each direction	11'	-	6'	none	
Lehigh Station Road	3	Dedicated left and right turn lane, 1 EB travel lane	11'	125'	2' WB, 3' EB	none	
Bailey Road/Chesapeake Landing							
East River Road - North	3	1 SB dedicated left turn lane, 1 travel lane each direction	11'	150'	SB varies from 2' to 5', NB 3'	none	Signal
East River Road - South	3	1 NB dedicated left turn lane, 1 travel lane each direction	11'	100'	4'	none	
Bailey Road	3	1 WB dedicated right turn lane, 1 travel lane each direction	11'	200'	8' EB, 3' WB	none	
Chesepeake Landing	2	1 travel lane each direction	10'	-	No Shoulder	gutter	
River Meadow Drive/Farnum Lane							
East River Road - North	2	1 travel lane each direction	11'	-	5'	none	Signal
East River Road - South	2	1 travel lane each direction	11'	-	9' NB, 5' SB	none	
Farnum Lane	3	1 WB dedicated right turn lane, 1 travel lane each direction	14' EB, 11' WB	100'	2' EB, 1' WB	none	
River Meadow Drive	2	1 travel lane each direction	10'	-	No Shoulder	none	
Jefferson Road							
East River Road - North	4	Dedicated left and right SB turn lanes, 1 Sb thru lane, 1 NB travel lane	11'	275'	5'	none	Signal
East River Road - South	5	Dedicated NB right and left turn lanes, 2 SB travel lanes, 1 NB thru lane	11'	300' right turn, 800' left turn	6'	none	
Jefferson Road - East	6	Dedicated WB left turn lane, 3 WB and 2 EB travel lanes	12'	350'	3'	curb	
Jefferson Road - West	7	Dedicated EB left and right and 1 WB dedicated right turn lanes, 2 EB and 2 WB travel lanes	12'	continuous	3' WB, none EB	curb/bridge	

Existing Traffic Volumes and Patterns

Traffic Volumes

Existing AM and PM traffic count data for the corridor intersections were provided from various sources as noted below:

Table 3 – Summary of Existing Traffic Count Data

Intersection East River Road (CR 84) at:	Count Source	Date Counted
Erie Station Road	[1]Graywood Commons TIS	November 2012
Brooks Road		
Lehigh Station Road		
Bailey Road/Chesapeake Landing	[2]The Grove at Rochester TIS	January 2013
River Meadow/Farnum Lane (RIT)	[3]Richland Housing Development TIS	November 2014
Jefferson Road	NYSDOT	March 2009

[1]*Graywood Commons Development Traffic Impact Study* - SRF Associates Dec 2013
[2]*The Grove at Rochester Traffic Impact Study* – Passero Associates Aug 2014
[3]*Richland Housing Development Traffic Impact Study* – McFarland Johnson Nov 2014

The Monroe County Average Daily Traffic (ADT) within the corridor varies from a low of 4,400 vehicles (2009) at the southern study limit to a high of 11,084 vehicles (2012) between Lehigh Station and Bailey. The existing traffic count data is shown in Figure 1.

Existing Travel Patterns

The Genesee River, which parallels East River Road to the west, has played an important role in establishing local and regional mobility. Traffic patterns in the area are very much controlled by the road network and the number of Genesee River crossings. Within the study area, there are only two river crossings that allow east west travel, one at the southern project limit, NYS Route 253 (Erie Station), and the other at the northern project limit, NYS Route 252 (Jefferson Road).

Proximity to the New York State Thruway Exit 46, I-390 and West Henrietta Road (NYS 15) also influence commuter travels patterns within and adjacent to the corridor. Several east-west roads within the corridor provide connectivity to either the expressways or West Henrietta Road. These roadways include Erie Station Road, Brooks Road, Lehigh Station Road (includes interchange with I-390) and Bailey Road. Scottsville Road also provides access to I-390 which is reflective of the high number of northbound left turns at the East River Road and Jefferson Road intersection.

The Rochester Institute of Technology (RIT) is located at the north end of the study area and is currently one of the major generators/employers within the corridor. The campus currently has three (3) access points on East River as well as access from Bailey Ave via John Street. The three (3) existing East River Road access points from south to north include:

1. Farnum Lane/River Meadow Drive (signalized)
2. Andrews Memorial Drive (unsignalized)
3. Ward Road (unsignalized)

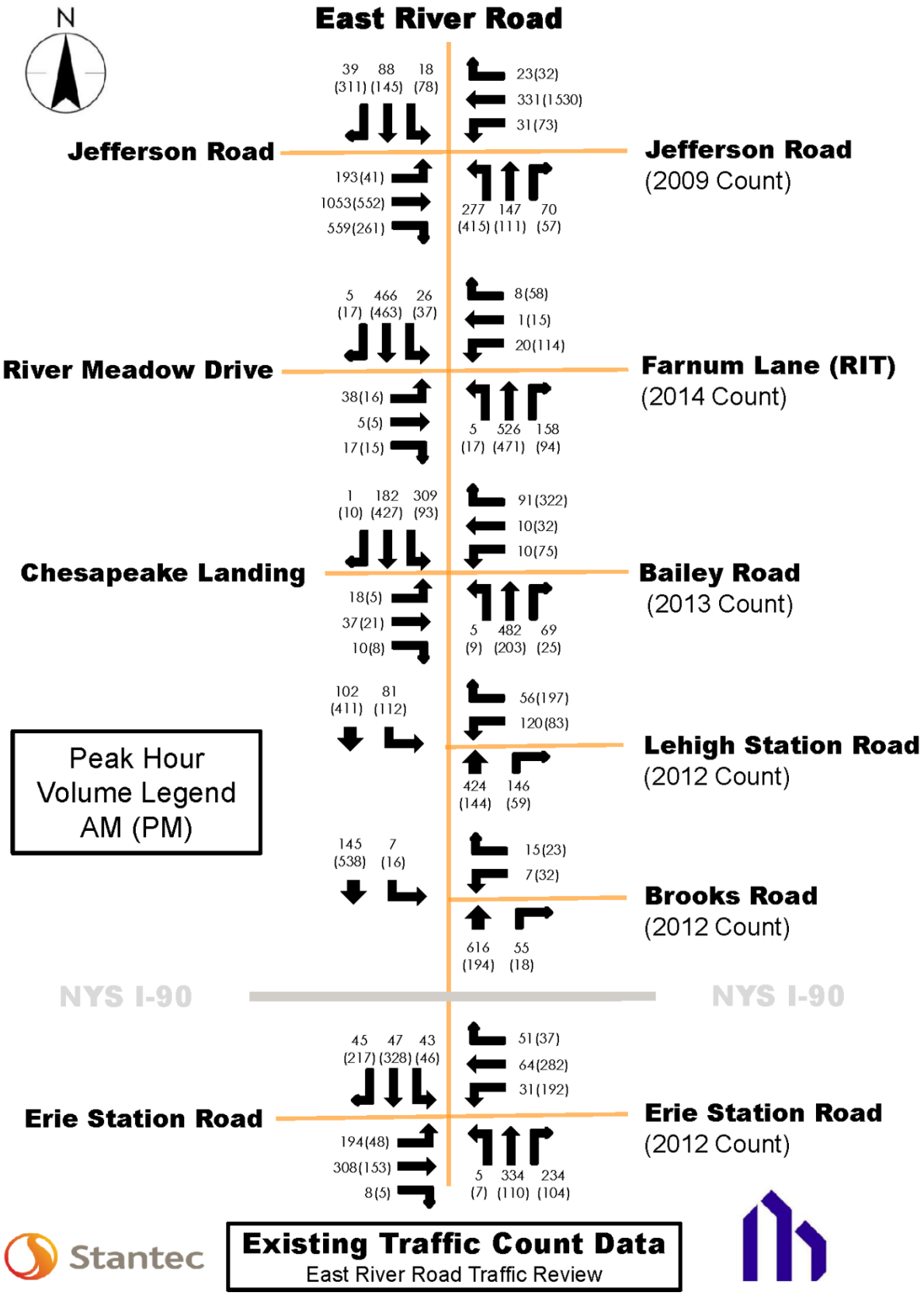


FIGURE 1 – Existing Traffic Count Data

Existing Capacity

The only intersection currently experiencing capacity issues is the East River Road and Jefferson Road intersection. The NB approach queues extend beyond the current left turn lane storage with vehicles waiting 2 or more cycles to clear the intersection. This is the only intersection with capacity issues under 2015 conditions.

FUTURE TRANSPORTATION DEMAND

Anticipated Development

Based on discussions with Town staff there are currently 20 developments that are anticipated within or adjacent to the corridor over the next 20 years. These developments include single family homes, apartments, student housing, senior housing, elementary school, light industrial and an RG&E substation. Except for the substation, all these developments will generate traffic on the adjacent roadways. The proposed development was divided into 5 year increments to provide short term and long term corridor impacts. See Table 2 for a development summary and Figure 3 for a map of the proposed East River Road developments anticipated over the next 20 years.

Area Growth

Background growth will account for anticipated corridor growth at local employers/generators like RIT as well as regional growth that originate from outside the study limits. Based on input from Monroe County, the existing traffic counts were grown by 1.5%/year in order to establish base year (2015) volumes. Based on the extensive development incorporated into this study, post 2015 growth for years 2020 thru 2035 was assumed to originate from the South (Town of Rush) with this volume grown by 0.5%/year. Future volumes with background growth are incorporated into the 'Base Volumes' for years 2015, 2020, 2025, 2030 and 2035. The Base volumes for these years also include the development generated traffic from the previous 5 years as discussed below. See Figure 2 for the background growth beyond 2015.

Committed Improvements

A widening project required by Town and constructed by a private development is planned for 2016-2017 to provide consistent shoulder widths for the roadway section just south of Fairwood Drive to Farnum Lane (RIT). Current development in construction may also introduce new driveways, shoulder work and turn lanes as required. Examples include possible shoulder work for the Kodak Riverwood project at Lehigh Station Road and the Foxfield subdivision project at Farrell Road.

Future Traffic Projections

As mentioned above the base year (2015) AM and PM peak hour traffic volumes were established by applying a 1.5% growth rate to the existing traffic count data. Background growth beyond year 2015 was established using 0.5% growth originating from the South (Town of Rush). Traffic volumes attributable to future development were established using the Trip Generation Manual, 9th Edition. The Trip Generation manual provides estimates of the number of trips entering and exiting a site which are generated by a specific land use. For this review we used the estimated trips generated during the peak hour (AM/PM) of the adjacent roadway. Figures 4.1 to 4.8 provides the trip generation summary for each development scenario in 5-year increments as noted above.

East River Road Traffic Study
Summary of Study Area Development

Parcel No.	Application No.	Development Phase	Anticipated Build-out	Name	Address	Main Access	Development Summary	
							Units	Land Use
Short Term								
1	PB-221.8	Construction	1-5 Years	Section 8 - Preserve Subdivision	York Bay Trail	East River/Bailey	26	Residential - Single Family
2	PB-221.9	Construction	1-5 Years	Section 9 - Preserve Subdivision	York Bay Trail	East River/Bailey	25	Residential - Single Family
3	PB - 221.10	Design	1-5 Years	Section 10 - Preserve Subdivision	York Bay Trail	East River/Bailey	15	Residential - Single Family
4A	N/A	Pre-Concept	1-5 Years	Wallman Property	3820/3860 East River Rd	East River Road	150,000	Industrial (SF)
5	15-013	Design	1-5 Years	Riverwood Student Housing	4545 East River Road	East River Road	256	Student Housing Units (685 students)**
8	N/A	Concept	1-5 Years	Riverwood Tech Campus	East River Road	East River Road	360,000	Office and Light Industrial (SF)
9	N/A	Concept	1-5 Years	DePaul (Jaynes South, Parcel E)	East River Road	East River/LeHigh	100	Residential - Sr. Housing
							400	Residential - Apartments
11	PB - 146.3	Design	1-5 Years	Section 3 - Chelsea Meadows	Thames Drive	Lehigh Station Rd	30	Residential - Single Family
13	PB - 294	Design	1-5 Years	Graywood Commons Subdivision	East River Road	East River/Brooks	200	Residential - Single Family
15	N/A	Concept	1-5 Years	Jaynes Riverview, Parcel J	East River Road	East River Road	141	Residential - Single Family
16	N/A	Concept	1-5 Years	Section 2 - Graywood Meadows (Jaynes Riverview, Parcel M)	Farrell Road Ext	East River Road	20	Residential - Single Family
18	15-008	Construction	1-5 Years	Erie Station Business Park - Flex Bldg II	30 Becker Road	Erie Station	37,851	Office (SF)
19	N/A	Concept	1-5 Years	Riverton Parcel 'A' - Phases I-IV	Erie Station Road	Erie Station Road	131	Residential - Single Family
20	PB-293	Construction	1-5 Years	Section 1&2 - Queens Park Subdivision	Moore and Martin Road	East River Road	125	Residential - Single Family
Mid-Term								
4B	N/A	Pre-Concept	5-10 Years	Wallman Property	3820/3860 East River Rd	East River Road	375	Residential - Apartments
6	N/A	Concept	5-10 Years	Jaynes North, Parcel A	East River Road	East River/LeHigh	100	Residential - Sr. Housing
							400	Residential - Apartments
7	N/A	Concept	5-10 Years	Jaynes Riverview, Parcels B & D	Lehigh Station Road	Lehigh Station Rd	400	Residential - Apartments
12	N/A	Concept	5-10 Years	Jaynes Riverview, Industrial Parcel H	East River Road	East River Road	–	RG&E Substation
14	N/A	Concept	5-10 Years	Jaynes Riverview, Parcel I	Brooks Road	Brooks/East River	115	Residential - Single Family
Long-Term								
10	N/A	Concept	10-15 Years	Jaynes Riverview, Parcel F	Lehigh Station Road	Lehigh Station Rd	400	Elementary School (Students)
17	N/A	Concept	10-15 Years	Jaynes Riverview, Parcel N*	East River Road	East River Road	7	Residential - Single Family

* parcel is mostly wetlands

** 2.67 students/unit per PA Grove TIA

Development potential estimated in consultation with the Town; prior TIA studies for some parcels may vary.

TABLE 4 – Summary of Study Area Development

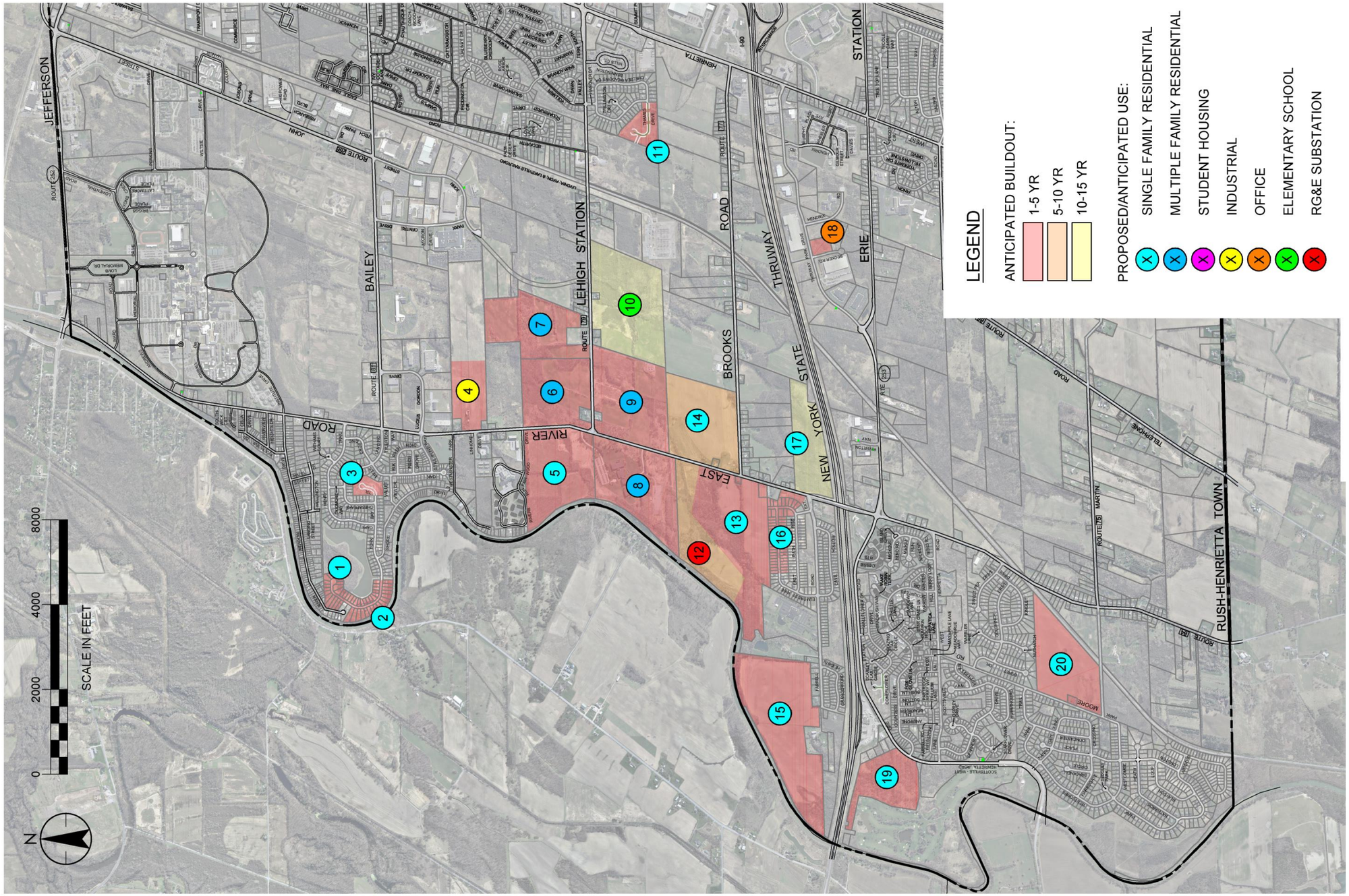


FIGURE 2 – Proposed East River Road Development

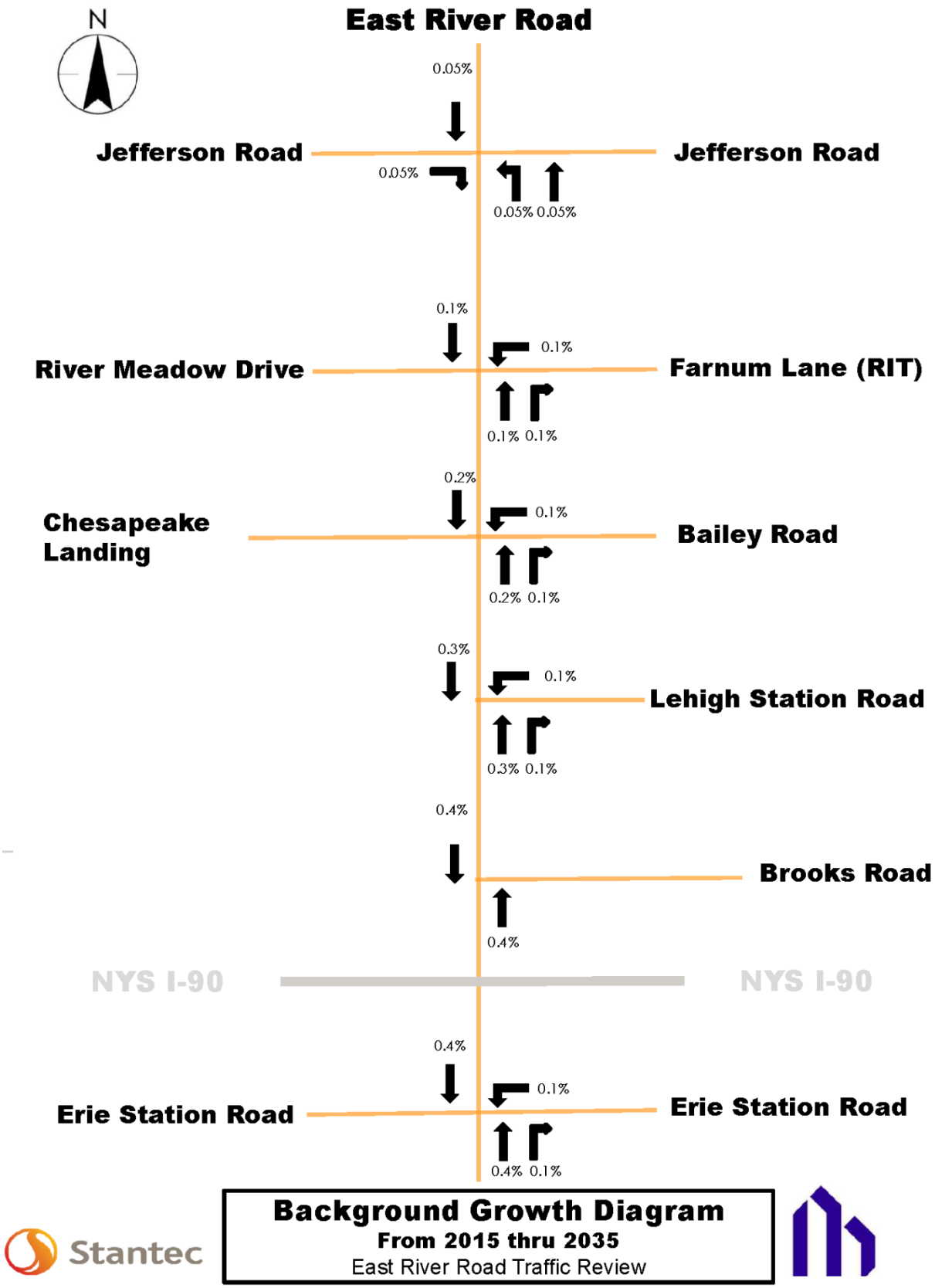


FIGURE 3 – Background Growth Years 2020 thru 2035

Future Development Trip Distribution

Assigning the future development trips to the adjacent highway network requires considering several factors including:

- Type of development
- Location of development within corridor
- Proximity to primary commuter routes and expressways
- Existing travel patterns
- Roadway traffic volumes and capacity

Distribution diagrams were established for each development using the above factors and are included in Appendix A.

East River Road Traffic Study
Summary of Trip Generation by Development
ITE Trip Generation (9th Edition)

Parcel No.	Name	Development Summary		Morning PH				Evening PH			
		Units	Land Use	Formula	Total	Enter	Exit	Formula	Total	Enter	Exit
Short Term											
1	Section 8 - Preserve Subdivision	26	Residential - Single Family	T=0.7(x)+9.74	28	7	21	Ln(T)=0.90 Ln(x)+0.51	31	20	11
2	Section 9 - Preserve Subdivision	25	Residential - Single Family	T=0.7(x)+9.74	27	7	20	Ln(T)=0.90 Ln(x)+0.51	30	19	11
3	Section 10 - Preserve Subdivision	15	Residential - Single Family	T=0.7(x)+9.74	20	5	15	Ln(T)=0.90 Ln(x)+0.51	19	12	7
4A	Wallman Property	150,000	Industrial (SF)	Ln(T)=0.79 Ln(X)+0.91	130	114	16	T=0.78(x)+30.48	148	18	130
5	Riverwood Student Housing	256	Student Housing Units (685 students)**	average per TIA (0.52)	133	27	106	average per TIA (0.60)	154	103	51
8	Riverwood Tech Campus	360,000	Office and Light Industrial (SF)	Ln(T)=0.79 Ln(X)+0.91	447	393	54	T=0.78(x)+30.48	443	67	376
9	DePaul (Jaynes South, Parcel E)	100	Residential - Sr. Housing	0.18	18	12	6	0.29	29	21	8
		400	Residential - Apartments	Ln(T)=0.82 Ln(x)+0.23	171	36	135	Ln(T)=0.88 Ln(X)+0.16	229	149	80
11	Section 3 - Chelsea Meadows	30	Residential - Single Family	T=0.7(x)+9.74	31	8	23	Ln(T)=0.90 Ln(x)+0.51	36	23	13
13	Graywood Commons Subdivision	200	Residential - Single Family	T=0.7(x)+9.74	150	37	112	Ln(T)=0.90 Ln(x)+0.51	196	123	73
15	Jaynes Riverview, Parcel J	141	Residential - Single Family	T=0.7(x)+9.74	108	27	81	Ln(T)=0.90 Ln(x)+0.51	143	90	53
16	Section 2 - Graywood Meadows (Jaynes Riverview, Parcel M)	20	Residential - Single Family	T=0.7(x)+9.74	24	6	18	Ln(T)=0.90 Ln(x)+0.51	24	15	9
18	Erie Station Business Park - Flex Bldg II	37,851	Office (SF)	Ln(T)=0.80 Ln(x) +1.57	88	77	11	T=1.12(x)+78.45	121	21	100
19	Riverton Parcel 'A' - Phases I-IV	131	Residential - Single Family	T=0.7(x)+9.74	101	25	76	Ln(T)=0.90 Ln(x)+0.51	134	84	50
20	Section 1&2 - Queens Park Subdivision	125	Residential - Single Family	T=0.7(x)+9.74	97	24	73	Ln(T)=0.90 Ln(x)+0.51	125	79	46
					1574	*807*	*767*		*1861*	*843*	*1019*
Mid-Term											
4B	Wallman Property	375	Residential - Apartments	Ln(T)=0.82 Ln(x)+0.23	163	34	129	Ln(T)=0.88 Ln(X)+0.16	216	140	76
6	Jaynes North, Parcel A	100	Residential - Sr. Housing								
		400	Residential - Apartments	Ln(T)=0.82 Ln(x)+0.23	171	36	135	Ln(T)=0.88 Ln(X)+0.16	229	149	80
7	Jaynes Riverview, Parcels B & D	400	Residential - Apartments	Ln(T)=0.82 Ln(x)+0.23	171	36	135	Ln(T)=0.88 Ln(X)+0.16	229	149	80
12	Jaynes Riverview, Industrial Parcel H	--	RG&E Substation	n/a	0	0	0	n/a	0	0	0
14	Jaynes Riverview, Parcel I	115	Residential - Single Family	T=0.7(x)+9.74	90	23	68	Ln(T)=0.90 Ln(x)+0.51	119	75	44
					595	*129*	*467*		*793*	*513*	*280*
Long-Term											
10	Jaynes Riverview, Parcel F	400	Elementary School (Students)	0.45	180	99	81	0.15	60	29	31
17	Jaynes Riverview, Parcel N*	7	Residential - Single Family	T=0.7(x)+9.74	15	4	11	Ln(T)=0.90 Ln(x)+0.51	10	6	4
					195	*103*	*92*		*70*	*36*	*34*
					2364	**1038**	**1326**		**2724**	**1392**	**1333**

* parcel is mostly wetlands

** 2.67 students/unit per PA Grove TIA

Development potential estimated in consultation with the Town; prior TIA studies for some parcels may vary.

TABLE 5 – Trip Generation Summary

Full Development Volumes

The estimated full development (Full Build) future peak hour volumes were established by combining the future base volumes and estimated development generated volumes. These volumes represent an estimate of the future corridor traffic conditions at each of the six (6) analysis intersections for years 2020, 2025, 2030 and 2035. Future Traffic volumes are shown in Figures 4.2 to 4.8.

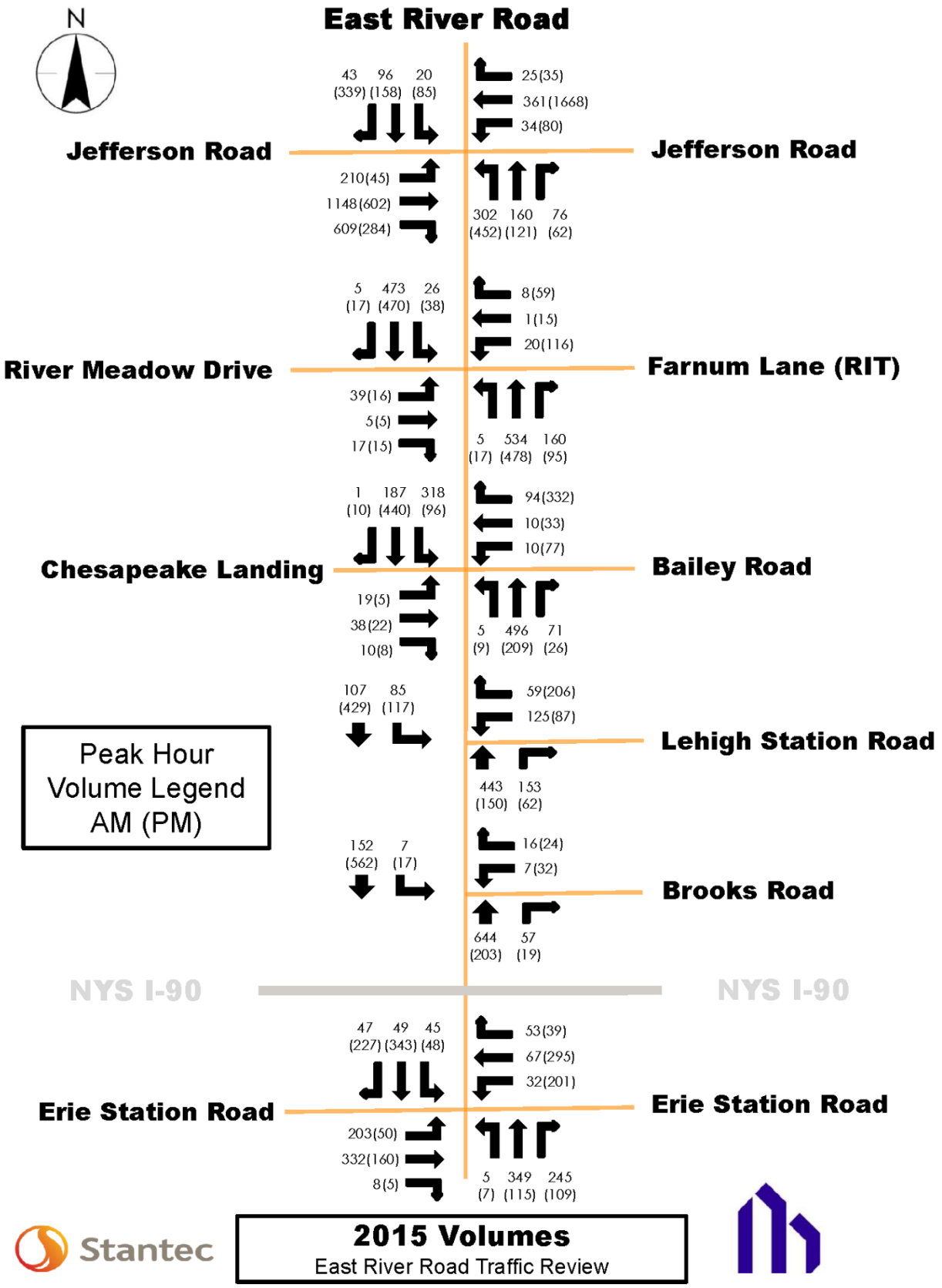


FIGURE 4.1 – 2015 Traffic Volumes

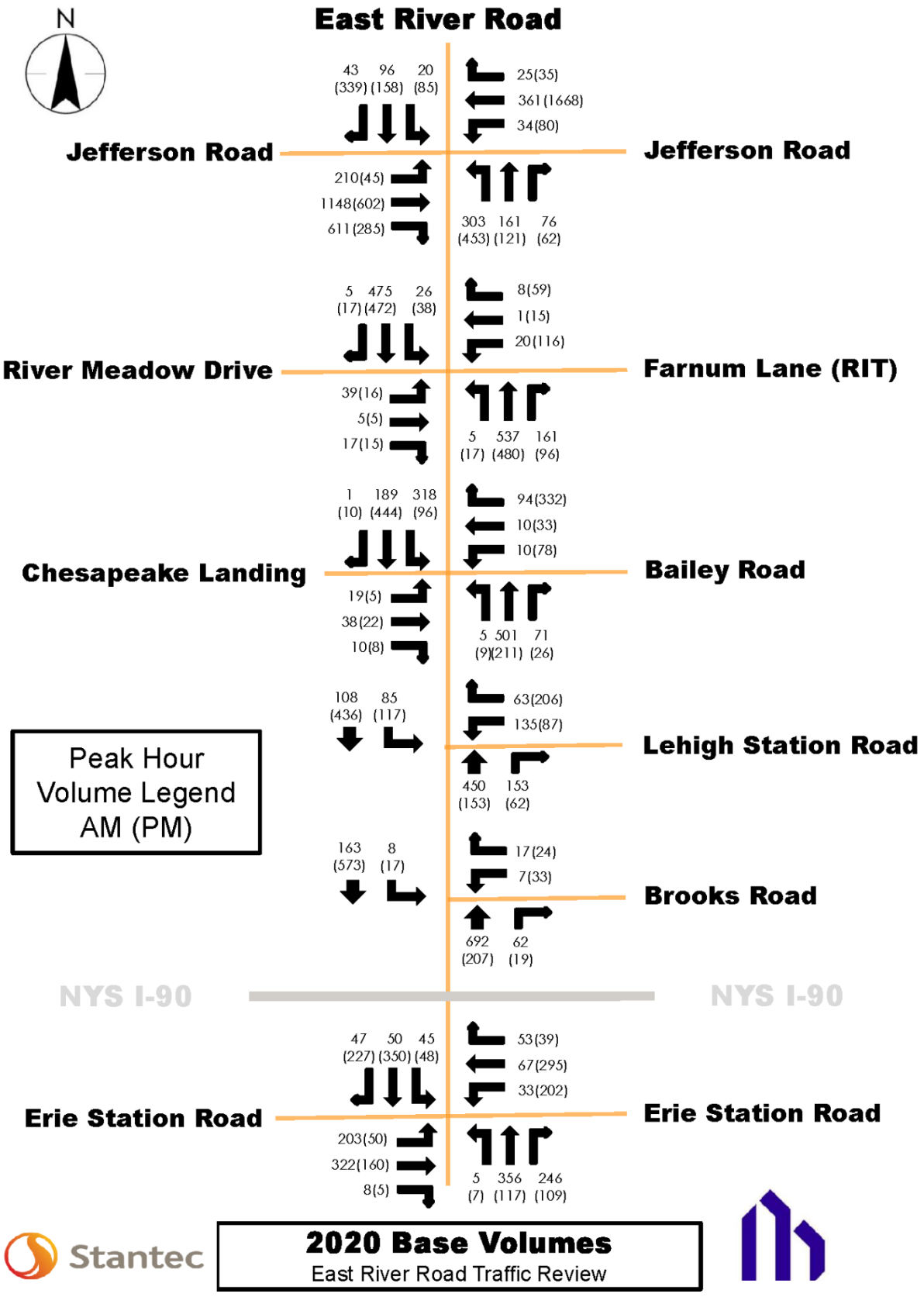


FIGURE 4.2 – 2020 Base Volumes

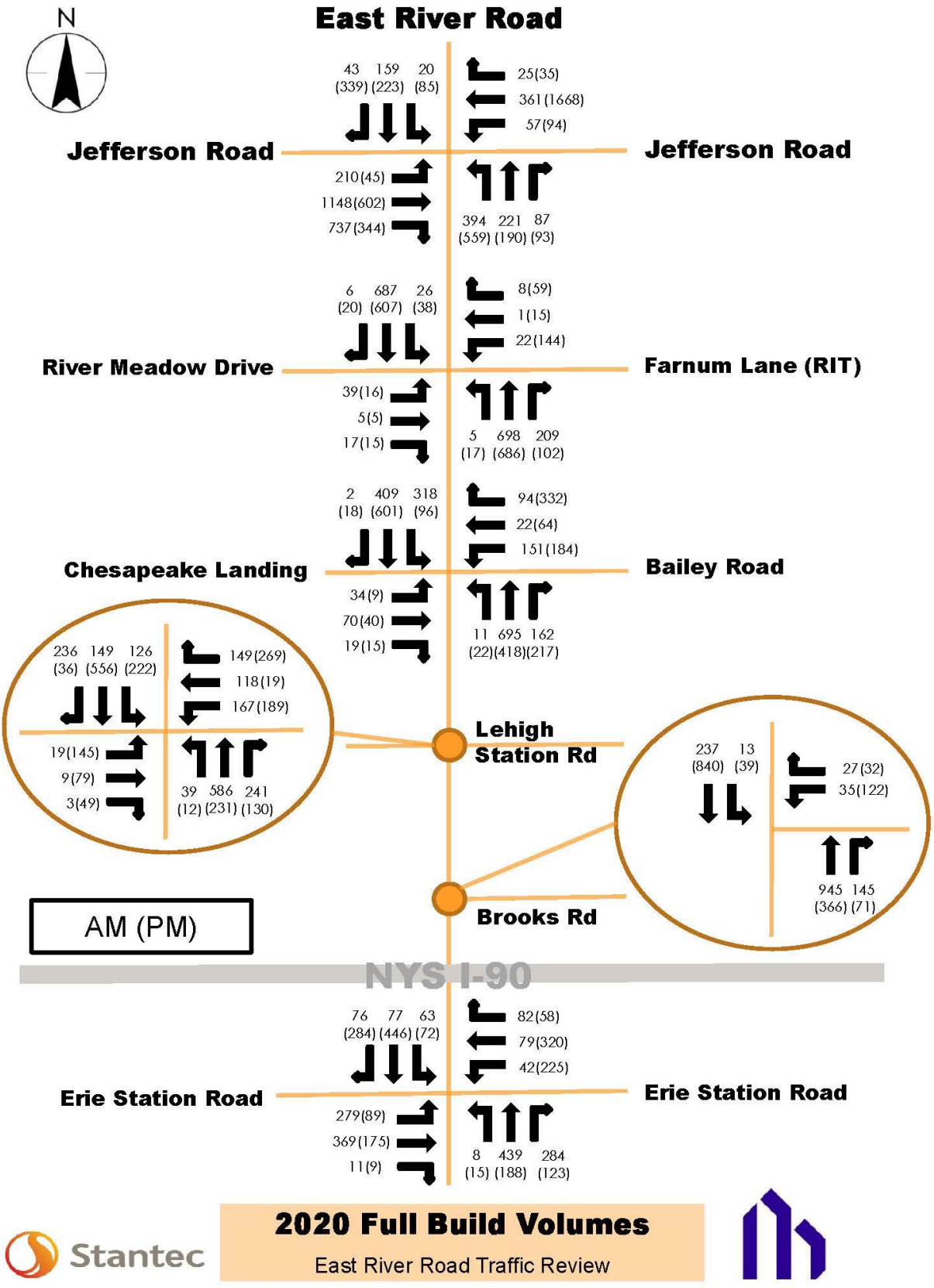


FIGURE 4.3 – 2020 Full Build Volumes

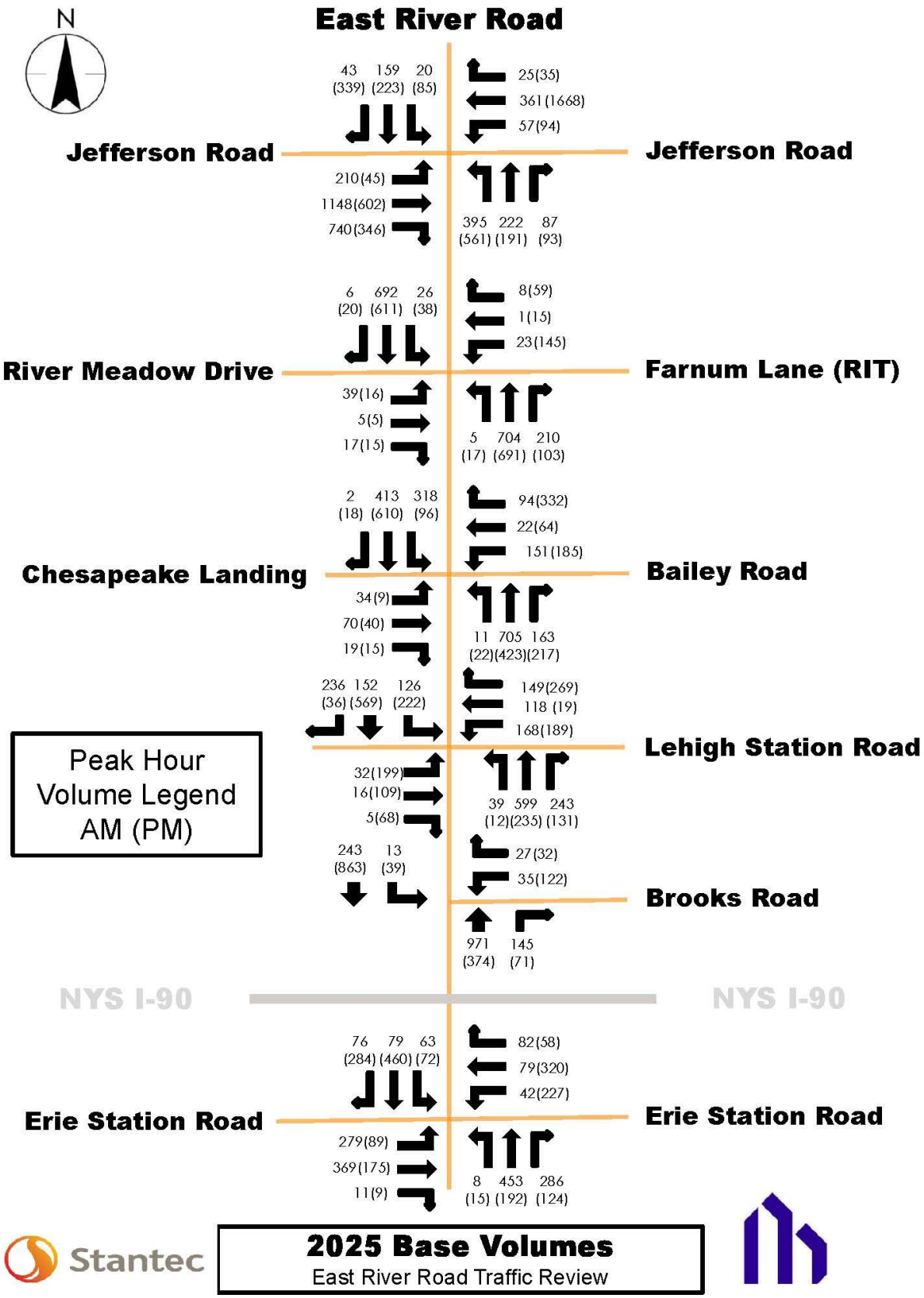


FIGURE 4.4 – 2025 Base Volumes

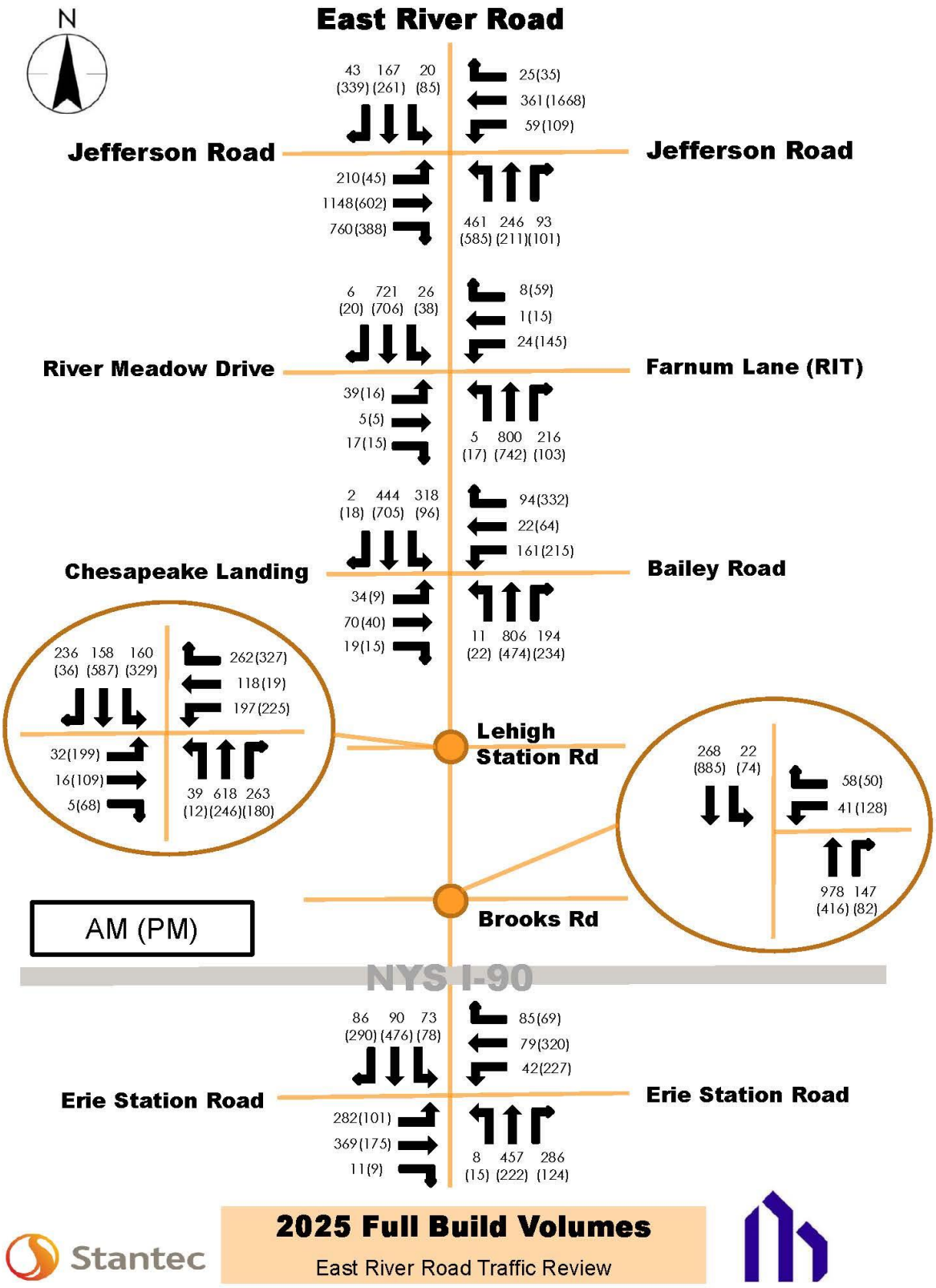


FIGURE 4.5 – 2025 Full Build Volumes

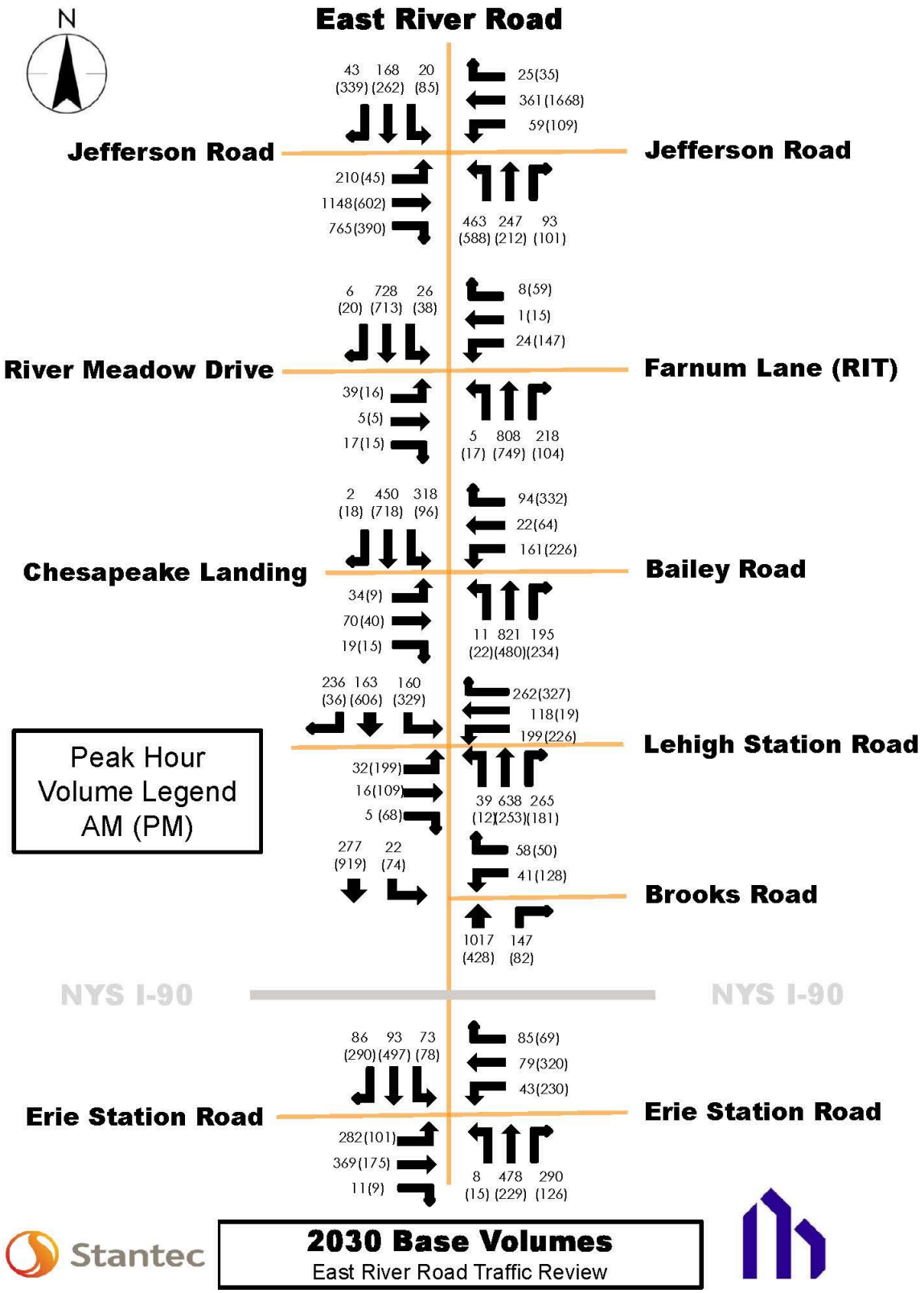


FIGURE 4.6 – 2030 Base Volumes

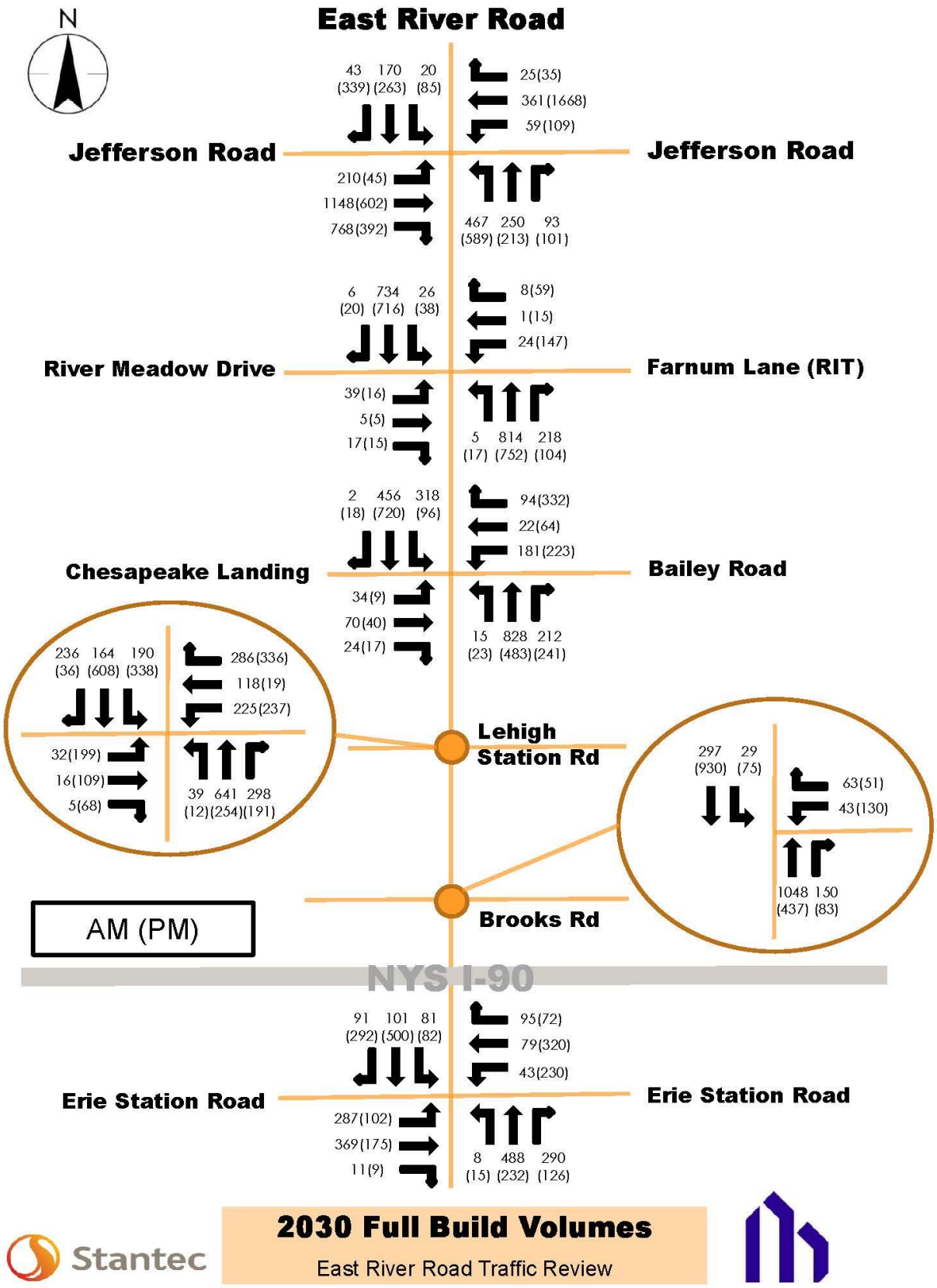


FIGURE 4.7 – 2030 Full Build Volumes

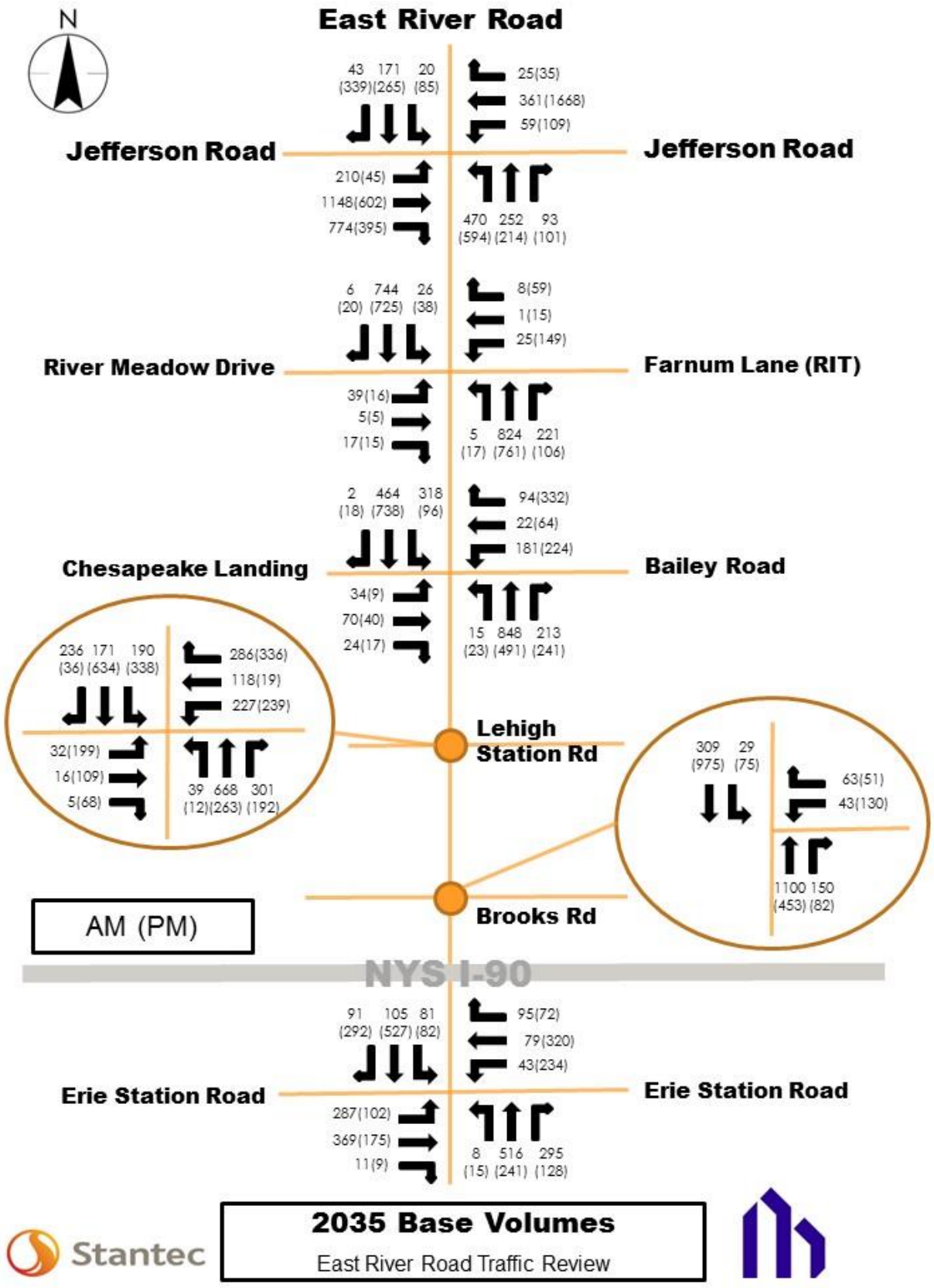


FIGURE 4.8 – 2035 Base Volumes

CAPACITY ANALYSIS

Intersection Capacity Analysis – Unsignalized and Signalized Intersections

The Highway Capacity Manual (HCM) defines capacity as; "The maximum sustainable flow rate at which vehicles or persons reasonably can be expected to traverse a point or uniform segment of a lane or roadway during a specified time period under given roadway, geometric, traffic, environmental, and control condition." Level of service (LOS) is a qualitative measure used to relate the quality of traffic service. LOS is used to analyze highways by categorizing traffic flow and assigning quality levels of traffic based on performance measure like speed, density, etc.

The HCM defines LOS for signalized and unsignalized intersections as a function of the average vehicle control delay. LOS may be calculated per movement or per approach for any intersection configuration, but LOS for the intersection as a whole is only defined for signalized and all-way stop configurations. Table 6 below provides the HCM LOS Criteria.

Table 6 – HCM 2010 LOS Criteria

LOS	**Signalized Intersection** Controlled Delay (sec/veh)	**Unsignalized Intersection** Controlled Delay (sec/veh)
A	≤10 sec	≤10 sec
B	>10 and ≤20 sec	>10 and ≤15 sec
C	>20 and ≤35 sec	>15 and ≤25 sec
D	>35 and ≤55 sec	>25 and ≤35 sec
E	>55 and ≤80 sec	>35 and ≤50 sec
F	>80 sec	>50 sec

The Monroe County Department of Transportation considers the following to be the minimum Level of Service expectations at signalized intersections.

- The LOS shall be “D” or better for the overall intersection and for each of its individual approaches, AND
- The LOS shall be “E” or better on every individual movement, AND
- The v/c ratios shall be less than 1.00 for every individual movement.

A capacity analysis was performed at each of the six (6) intersections using the traffic modeling software Synchro Version 9.0, which utilizes HCM 2010 methodologies. Level of Service was calculated for each of the following analysis scenarios:

- 2015 (Existing)
- 2020/2025/2030 Base Conditions
- 2020 /2025/2030/2035 Full Development Conditions

Base conditions for years 2025/2030 builds upon previous full development conditions. No development was included beyond year 2030. The capacity analysis results are shown in Figures 5.1 to 5.5 - LOS table. Synchro analysis printouts are contained in Appendix B.

		AM Peak Hour					PM Peak Hour					2015 AM Mitigation					2015 PM Mitigation				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
E River Rd & 253 *Signalized*	EB-LTR	0.52	19.7	B	120	169	0.21	15.6	B	40	65	No Mitigation					No Mitigation				
	WB-LTR	0.15	9.9	A	17	36	0.53	19.6	B	116	167										
	NB-LTR	0.87	35.6	D	297	510	0.34	13.8	B	65	122										
	SB-LT	0.23	17.7	B	35	70	0.60	23.6	C	175	272										
	SB-R	0.07	3.6	A	0	16	0.31	3.3	A	0	42										
	Intersection	-	24.7	C	-	-	-	16.9	B	-	-										
E River Rd & Brooks *Unsignalized*	WB-LR	0.07	15.6	A	-	6	0.15	15.2	B	-	13	No Mitigation					No Mitigation				
	NB-TR	0.46	0.0	A	-	0	0.15	0.0	A	-	0										
	SB-LT	0.01	0.5	A	-	1	0.01	0.4	A	-	1										
	Intersection	-	0.5	A	-	-	-	1.3	A	-	-										
E River Rd & Lehigh Station *Signalized*	WB-L	0.42	31.2	C	58	108	0.19	13.1	B	15	51	No Mitigation					No Mitigation				
	WB-R	0.19	8.6	A	0	30	0.37	4.6	A	0	39										
	NB-T	0.35	5.6	A	77	152	0.18	6.5	A	19	45										
	NB-R	0.14	3.1	A	13	38	0.08	2.2	A	0	12										
	SB-L	0.15	5.2	A	12	34	0.22	7.2	A	15	39										
	SB-T	0.09	4.3	A	15	36	0.52	9.6	A	65	135										
	Intersection	-	8.5	A	-	-	-	7.8	A	-	-										
E RIVER Rd & Kodak N *Unsignalized*	EB-L	0.01	18.0	A	-	1	0.12	10.1	B	-	0.4	No Mitigation					No Mitigation				
	EB-R	0.01	9.4	A	-	1	0.15	9.0	A	-	0.5										
	NB-L	0.10	8.1	A	-	8	0.01	7.9	A	-	0.0										
	NB-T	0.25	0.0	A	-	0	0.60	15.5	B	-	4.1										
	SB-T	0.12	0.0	A	-	0	0.79	24.2	C	-	7.4										
	SB-R	0.04	0.0	A	-	0	0.01	6.6	A	-	0.0										
	Intersection	-	1.3	A	-	-	-	18.8	B	-	-										
E River Rd & Chesapeake Landing/ Bailey *Signalized*	EB-LT	0.21	31.2	C	26	65	0.06	16.1	B	7	25	No Mitigation					No Mitigation				
	EB-R	0.03	0.2	A	0	0	0.02	0.1	A	0	0										
	WB-LT	0.08	29.9	C	9	31	0.31	19.3	B	30	75										
	WB-R	0.28	9.3	A	0	42	0.53	5.6	A	0	54										
	NB-L	0.01	12.2	B	1	9	0.03	12.9	B	2	11										
	NB-TR	0.72	21.7	C	211	404	0.43	16.1	B	57	123										
	SB-L	0.55	7.9	A	37	106	0.14	4.6	A	10	29										
	SB-TR	0.14	3.2	A	23	42	0.49	8.4	A	66	151										
	Intersection	-	14.9	B	-	-	-	9.9	A	-	-										
E River Rd & Meadows / RIT *Signalized*	EB-LTR	0.19	17.6	B	15	46	0.11	13.0	B	5	29	No Mitigation					No Mitigation				
	WB-LT	0.06	20.9	C	7	24	0.43	22.3	C	34	99										
	WB-R	0.02	0.1	A	0	0	0.15	6.6	A	0	26										
	NB-LTR	0.54	6.2	A	126	220	0.55	9.3	A	104	247										
	SB-LTR	0.40	4.9	A	80	136	0.51	8.9	A	92	215										
	Intersection	-	6.4	A	-	-	-	10.4	B	-	-										
E River Rd & Jefferson *Signalized*	EB-L	0.41	10.4	B	54	79	0.29	30.6	C	27	50	0.40	4.9	A	30	49	0.20	5.6	A	4	7
	EB-T	0.62	15.4	B	367	383	0.36	30.6	C	194	238	0.61	6.9	A	174	240	0.31	6	A	72	98
	EB-R	0.56	3.4	A	33	36	0.31	16.3	B	118	167	0.55	1.7	A	12	23	0.28	1.9	A	6	7
	WB-L	0.26	24.7	C	15	45	0.27	30.4	C	45	96	0.25	23.9	C	15	44	0.24	19.9	B	31	69
	WB-TR	0.20	16.5	B	57	84	0.87	39.8	D	495	677	0.20	15.9	B	56	84	0.80	26.6	C	347	429
	NB-L	0.84	48.2	D	184	269	0.82	39.5	D	272	349	0.67	47.1	D	106	148	0.82	53.5	D	148	220
	NB-T	0.31	26.9	C	87	132	0.15	19.9	B	57	89	0.33	27.7	C	88	132	0.21	24.8	C	56	100
	NB-R	0.16	7.3	A	4	34	0.09	4.2	A	0	24	0.16	7.4	A	4	34	0.11	4	A	0	20
	SB-L	0.17	41.0	D	13	36	0.45	54.1	D	64	119	0.17	41.0	D	13	36	0.59	58.1	E	53	112
	SB-T	0.50	48.7	D	66	113	0.55	54.6	D	120	194	0.50	48.7	D	66	113	0.71	60.1	E	101	185
	SB-R	0.16	1.2	A	0	0	0.86	44.8	D	134	293	0.10	3.0	A	0	12	0.75	35.8	D	152	251
	Intersection	-	17.5	B	-	-	-	36.5	D	-	-	-	13.5	B	-	-	-	26.8	C	-	-

FIGURE 5.1 – 2015 LOS Table

Intersection	LANE GROUP	2020 Base										2020 Build										2020 Build Mitigation									
		AM Peak Hour					PM Peak Hour					AM Peak Hour					PM Peak Hour					AM Peak Hour					PM Peak Hour				
		V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
E River Rd & 253 *Signalized*	EB-LTR	0.51	19.6	B	117	166	0.33	17.1	B	53	84	0.90	44.3	D	195	305	0.43	23.3	C	63	100	0.80	32.0	C	172	295	0.40	20.3	C	51	102
	WB-LTR	0.15	9.9	A	17	37	0.60	21.0	C	134	191	0.30	14.3	B	27	56	0.76	30.6	C	161	228	0.25	12.8	B	24	55	0.74	26.4	C	132	234
	NB-LTR	0.89	37.0	D	304	523	0.48	18.2	B	112	188	0.84	25.3	C	322	572	0.41	13.1	B	98	163	0.85	24.9	C	322	501	0.46	14	B	90	175
	SB-LT	0.24	17.8	B	36	72	0.79	31.7	C	247	419	0.27	12.3	B	42	80	0.69	21.6	C	223	346	0.26	11.6	B	42	77	0.76	24.5	C	204	367
	SB-R	0.07	3.6	A	0	16	0.37	3.4	A	0	46	0.09	2.7	A	0	20	0.34	3.2	A	7	47	0.10	2.5	A	0	19	0.36	3.2	A	3	45
	Intersection	-	25.3	C	-	-	-	20.2	C	-	-	-	37.4	D	-	-	-	20.5	C	-	-	-	24.1	C	-	-	-	19.8	B	-	-
E River Rd & Brooks *Unsignalized*	WB-LR	0.08	16.5	A	-	6	0.46	35.3	D	-	56	0.39	37.5	E	-	42	1.06	145.5	F	-	217	Movement Does Not Exist									
	WB-L	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					0.24	33.7	D	-	22	0.95	123.1	F	-	168
	WB-R																					0.11	19.6	C	-	9	0.06	10.9	B	-	4
	NB-TR	0.49	0.0	A	-	0	0.27	0.0	A	-	0	0.71	0.0	A	-	0	0.29	0.0	A	-	0	Movement Does Not Exist									
	NB-T	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					0.62	0.0	A	-	0	0.24	0.0	A	-	0
	NB-R																					0.09	0.0	A	-	0	0.05	0.0	A	-	0
	SB-LT	0.01	0.6	A	-	1	0.04	1.0	A	-	3	0.02	0.9	A	-	2	0.04	1.1	A	-	3	Movement Does Not Exist									
	SB-L	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					0.02	11.4	B	-	2	0.04	8.5	A	-	3
	SB-T																					0.15	0.0	A	-	0	0.55	0.0	A	-	0
	Intersection	-	0.5	A	-	-	-	2.9	A	-	-	-	1.8	A	-	-	-	16	C	-	-	-	1.3	A	-	-	-	10.7	B	-	-
E River Rd & Lehigh Station *Signalized*	EB-L	Movement Does Not Exist					Movement Does Not Exist					0.33	34.2	C	15	42	0.69	31.9	C	72	186	0.24	29.0	C	14	40	0.61	28.4	C	70	213
	EB-TR											0.07	19.7	B	7	25	0.28	13.8	B	41	105	0.05	18.7	B	7	24	0.27	14.4	B	42	114
	WB-L	0.45	31.7	C	63	116	0.19	13.2	B	15	51	0.59	34.2	C	78	140	0.46	20.4	C	60	146	0.53	30.2	C	78	140	0.44	21.3	C	61	157
	WB-LT	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist				
	WB-R	0.20	8.4	A	0	31	0.37	4.6	A	0	39																				
	WB-TR											0.66	26.7	C	91	170	0.39	4.3	A	5	56	0.60	23.4	C	91	170	0.39	4.7	A	5	62
	NB-T	0.39	6.4	A	81	157	0.18	6.5	A	19	45	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist				
	NB-LT																														
	NB-L	Movement Does Not Exist					Movement Does Not Exist					0.06	6.3	A	7	21	0.06	12.5	B	3	14	0.06	5.6	A	6	19	0.07	10.1	B	3	11
	NB-TR											0.75	13.3	B	223	466	0.47	13.6	B	90	198	0.80	15.5	B	223	466	0.48	12.4	B	92	152
	NB-R	0.15	3.3	A	14	38	0.08	2.2	A	0	12	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist				
	SB-L	0.17	5.4	A	13	35	0.22	7.2	A	15	40	0.62	25	C	32	147	0.65	24.4	C	71	186	0.80	47.9	D	37	164	0.68	24.7	C	76	152
	SB-TR	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist				
	SB-T	0.09	4.5	A	15	37	0.52	9.7	A	66	137	0.13	5.2	A	23	52	0.70	20.2	C	185	376	0.14	5.4	A	23	52	0.72	19.9	B	196	297
	SB-R											0.24	1.5	A	0	27	0.05	4.9	A	1	17	0.25	1.7	A	0	27	0.05	3.3	A	0	13
	Intersection	-	9.2	A	-	-	-	7.8	A	-	-	-	16.1	B	-	-	-	17.5	B	-	-	-	17.6	B	-	-	-	17.1	B	-	-
E RIVER Rd & Kodak N *Unsignalized*	EB-L	0.01	18.3	A	-	1	0.12	10.1	A	-	0.4	Intersection Does Not Exist					Intersection Does Not Exist					Intersection Does Not Exist					Intersection Does Not Exist				
	EB-R	0.01	9.4	A	-	1	0.15	9.0	A	-	0.5																				
	NB-L	0.10	8.1	A	-	8	0.01	7.9	A	-	0.0																				
	NB-T	0.26	0.0	A	-	0	0.61	15.7	A	-	4.2																				
	SB-T	0.12	0.0	A	-	0	0.80	25.3	A	-	7.7																				
	SB-R	0.04	0.0	A	-	0	0.01	6.6	A	-	0.0																				
	Intersection	-	1.3	A	-	-	-	19.4	A	-	-																				
E River Rd & Chesapeake Landing/ Bailey *Signalized*	EB-LT	0.19	28.3	C	22	64	0.06	16.3	B	7	25	0.50	38.1	D	53	105	0.12	23.4	C	21	48	0.50	38.1	D	53	105	0.12	23.4	C	21	48
	EB-R	0.03	0.1	A	0	0	0.02	0.1	A	0	0	0.06	0.3	A	0	0	0.03	0.1	A	0	0	0.06	0.3	A	0	0	0.03	0.1	A	0	0
	WB-LT	0.07	27.5	C	7	30	0.31	19.4	B	30	76	0.91	79.1	E	95	217	0.74	41.0	D	126	242	0.91	79.1	E	95	217	0.74	41.0	D	126	242
	WB-R	0.26	8.9	A	0	42	0.53	5.6	A	0	55	0.29	8.8	A	0	40	0.53	6.2	A	0	63	0.29	8.8	A	0	40	0.53	6.2	A	0	63
	NB-L	0.01	9.6	A	1	7	0.03	12.9	B	2	11	0.02	9.2	A	3	10	0.07	13.1	B	7	20	0.02	9.2	A	3	10	0.07	13.1	B	7	20
	NB-TR	0.73	19.4	B	185	353	0.43	16.1	B	57	123	0.98	44.3	D	427	714	0.83	28.0	C	283	499	0.98	44.3	D	427	714	0.83	28.0	C	283	499
	NB-T	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist				
	NB-R																														
	SB-L	0.58	9.5	A	37	109	0.14	4.6	A	10	29	0.94	56.5	E	121	284	0.25	6.5	A	17	34	0.94	56.5	E	121	284	0.25	6.5	A	17	34
	SB-TR	0.15	3.4	A	23	41	0.50	8.5	A	67	154	0.34	5.0	A	69	107	0.61	11.3	B	177	272	0.34	5.0	A	69	107	0.61	11.3	B	177	272
	Intersection	-	14.0	B	-	-	-	10.0	A	-	-	-	38.6	D	-	-	-	19.4	B	-	-	-	38.6	D	-	-	-	19.4	B	-	-
E River Rd & Meadows / RIT *Signalized*	EB-LTR	0.19	17	B	15	44	0.11	13.7	B	5	30	0.21	18.3	B	18	45	0.11	15.2	B	8	30	No Mitigation					No Mitigation				
	WB-LT	0.06	20.2	C	7	23	0.44	23.4	C	35	106	0.07	21.3	C	9	25	0.57	31	C	67	127										
	WB-R	0.02	0.1	A	0	0	0.15	6.9	A	0	27	0.02	0.1	A	0	0	0.16	7.1	A	0	27										
	NB-LTR	0.54	6.2	A	122	223	0.55	9.1	A	103	254	0.69	9.6	A	210	516	0.77	15.5	B	220	489										
	SB-LTR	0.40	5.0	A	80	140	0.51	8.8	A	91	223	0.56	6.6	A	142	247	0.67	12.2	B	164	341										
	Intersection	-	6.4	A	-	-	-	10.4	B	-	-	-	8.8	A	-	-	-	15.4	B	-	-										
E River Rd & Jefferson *Signalized*	EB-L	0.40	4.9	A	30	49	0.20	5.6	A	4	7	0.54	16.6	B	74	71	0.24	13.4	B	25	27	No Mitigation					No Mitigation				
	EB-T	0.61	6.9	A	174	240	0.31	6.0	A	74	100	0.79	24	C	361	361	0.33	15.8	B	190	241										
	EB-R	0.55	1.7	A	12	23	0.28	1.9	A	6	7	0.75	6.6	A	67	61	0.34	8.8	A	137	195										
	WB-L	0.25	23.9	C	15	44	0.24	19.9	B	31	69	0.82	90.7	F	36	110	0.30	25.8	C	47	98										
	WB-TR	0.20	15.9	B	56	84	0.80	26.6	C	347	429	0.24	19.3	B	64	78	0.83	33.7	C	430	535										
	NB-L	0.67	47.1	D	107	148	0.83	53.6	D	149	221	0.76	48.7	D	138	191	0.87	61.1	E	223	307										
	NB-T	0.33	27.7	C	89	133	0.21	24.8	C	56	100	0.31	21.2	C	104	174	0.28	26.7	C	102	160										
	NB-R	0.16	7.4	A	4	34	0.11	4.0	A	0	20	0.14	7.4	A	8	40	0.15	5.1	A	0	34										
	SB-L	0.17	41.1	D	13	36	0.59	58.1	E	53	112	0.09	35.1	D	12	35	0.51	58	E	63	119										
	SB-T	0.50	48.7	D	66	113	0.71	60.1	E	101	185	0.42	38.5	D	102	172	0.82	72.8	E	173	293										
	SB-R	0.10	3.0	A	0	12	0.75	35.8	D	152	251	0.08	3	A	0	13	0.75	42.7	D	200	298										
	Intersection	-	13.5	B	-	-	-	26.8	C	-	-	-	23.1	C	-	-	-	34.7	C	-	-										

FIGURE 5.2 – 2020 LOS Table

Intersection	LANE GROUP	2025 Base										2025 Build										2025 Build Mitigation									
		AM Peak Hour					PM Peak Hour					AM Peak Hour					PM Peak Hour					AM Peak Hour					PM Peak Hour				
		V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
E River Rd & 253 *Signalized*	EB-LTR	0.82	33.7	C	174	305	0.42	21.3	C	53	106	0.82	34.1	C	176	307	0.45	22.4	C	60	110	No Mitigation					No Mitigation				
	WB-LTR	0.26	13.2	B	24	56	0.76	28.2	C	137	245	0.26	13.1	B	24	56	0.78	29.5	C	149	245										
	NB-LTR	0.86	24.8	C	325	508	0.45	13.3	B	92	169	0.86	25.1	C	329	513	0.49	14.5	B	113	198										
	SB-LT	0.26	11.1	B	41	76	0.76	23.8	C	214	363	0.31	11.9	B	49	89	0.80	25.9	C	241	403										
	SB-R	0.09	2.4	A	0	18	0.36	3.7	A	9	51	0.11	2.3	A	0	20	0.36	3.5	A	8	50										
	Intersection	-	24.7	C	-	-	-	20.2	C	-	-	-	24.8	C	-	-	-	21.4	C	-	-										
E River Rd & Brooks *Unsignalized*	WB-LR	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					No Mitigation					No Mitigation				
	WB-L	0.17	32.9	D	-	15	1.00	325.8	F	-	178	0.33	42.3	E	-	33	1.34	278.1	F	-	276										
	WB-R	0.11	20.3	C	-	9	0.06	11.8	B	-	4	0.24	23.1	C	-	23	0.09	11.6	B	-	9										
	NB-TR	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist														
	NB-T	0.63	0	A	-	0	0.24	0	A	-	0	0.64	0	A	-	0	0.27	0	A	-	0										
	NB-R	0.09	0	A	-	0	0.05	0	A	-	0	0.10	0	A	-	0	0.05	0	A	-	0										
	SB-LT	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist														
	SB-L	0.02	11.6	B	-	2	0.04	8.9	A	-	3	0.04	11.8	B	-	3	0.08	8.9	A	-	7										
	SB-T	0.16	0	A	-	0	0.56	0	A	-	0	0.18	0	A	-	0	0.58	0	A	-	0										
	Intersection	-	1	A		-	-	11.9	B		-	-	2.2	A		-	-	22.5	C		-										
E River Rd & Lehigh Station *Signalized*	EB-L	0.27	30.5	C	14	41	0.67	31.1	C	72	182	0.38	37.4	D	15	44	0.93	72.9	E	119	261	No Mitigation					No Mitigation				
	EB-TR	0.05	18.5	B	7	24	0.29	14.0	B	41	105	0.05	18.0	B	7	24	0.30	17.7	B	62	115										
	WB-L	0.55	31.8	C	78	141	0.48	22.0	C	63	149	0.64	35.1	D	94	165	0.63	32.2	C	116	202										
	WB-T	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist														
	WB-TR	0.62	24.6	C	91	170	0.41	4.6	A	5	57	0.81	32.0	C	130	266	0.47	5.1	A	8	66										
	WB-R	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist														
	NB-L	0.06	5.5	A	6	19	0.06	12.4	B	3	14	0.06	6.0	A	7	19	0.05	10.7	B	3	13										
	NB-T	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist														
	NB-TR	0.79	15.2	B	232	486	0.47	13.4	B	90	202	0.82	17.6	B	325	640	0.49	13	B	135	214										
	NB-R	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist														
	SB-L	0.77	42.1	D	37	163	0.64	24.1	C	70	187	1.10	123.3	F	106	151	0.95	57.6	E	183	376										
	SB-T	0.14	5.4	A	24	53	0.71	20.2	C	188	389	0.14	5.8	A	31	55	0.66	18.5	B	247	366										
	SB-R	0.25	1.6	A	0	27	0.05	4.9	A	1	17	0.24	1.6	A	0	27	0.05	4.0	A	1	15										
	Intersection	-	17.4	B	-	-	-	17.6	B	-	-	-	27.3	C	-	-	-	26.7	C	-	-										
E River Rd & Chesapeake Landing/ Bailey *Signalized*	EB-LT	0.50	38.1	D	53	105	0.12	23.4	C	21	48	0.57	43.1	D	54	116	0.12	24.2	C	21	49	0.42	36.7	D	58	110	0.10	22.0	C	19	49
	EB-R	0.06	0.3	A	0	0	0.03	0.1	A	0	0	0.06	0.3	A	0	0	0.03	0.1	A	0	0	0.06	0.3	A	0	0	0.03	0.1	A	0	0
	WB-LT	0.91	79.1	E	95	217	0.75	41.5	D	127	246	1.01	104.6	F	105	236	0.86	53.1	D	150	298	0.86	69.1	E	112	236	0.73	37.3	D	139	275
	WB-R	0.29	8.8	A	0	40	0.53	6.1	A	0	63	0.30	9.1	A	0	41	0.54	6.3	A	0	64	0.26	8.5	A	0	41	0.50	5.4	A	0	61
	NB-L	0.02	9.2	A	3	10	0.07	13.1	B	7	20	0.02	8.5	A	3	10	0.09	13.0	B	6	20	0.03	10.5	B	3	12	0.12	16.9	B	8	25
	NB-T	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					0.92	35.8	D	438	710	0.66	23.4	C	216	338
	NB-TR	0.99	47.3	D	440	728	0.84	28.5	C	289	507	1.10	81.7	F	639	877	0.90	34.3	C	338	584	Movement Does Not Exist					Movement Does Not Exist				
	NB-R	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					0.23	2.3	A	0	32	0.31	3.3	A	0	42
	SB-L	0.94	56.5	E	121	284	0.25	6.5	A	17	34	1.01	72.9	E	125	297	0.28	6.7	A	16	33	0.98	69.0	E	147	326	0.21	7.9	A	21	43
	SB-TR	0.34	5.0	A	70	109	0.62	11.5	B	182	279	0.37	5.0	A	75	115	0.70	13.1	B	221	341	0.38	6.2	A	96	143	0.76	18.1	B	278	447
	Intersection	-	39.8	D	-	-	-	19.6	B	-	-	-	60.6	E	-	-	-	23.7	C	-	-	-	32.8	C	-	-	-	17.7	B	-	-
E River Rd & Meadows / RIT *Signalized*	EB-LTR	0.22	22.1	C	21	52	0.11	15.4	B	8	31	0.24	22.5	C	21	52	0.12	15.3	B	8	31	No Mitigation					No Mitigation				
	WB-LT	0.09	26.2	C	11	30	0.57	31.2	C	69	129	0.10	26.4	C	12	31	0.58	32	C	69	129										
	WB-R	0.03	0.1	A	0	0	0.16	7.2	A	0	27	0.03	0.1	A	0	0	0.16	7.2	A	0	27										
	NB-LTR	0.68	8	A	214	384	0.78	15.6	B	226	480	0.75	10.7	B	281	664	0.82	17.8	B	257	616										
	NB-L	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist														
	NB-T																														
	NB-R																														
	SB-L																														
	SB-LTR	0.55	5.8	A	143	237	0.68	12.3	B	167	339	0.57	6.1	A	155	259	0.76	15.3	B	213	451										
	SB-TR	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist														
	Intersection	-	7.8	A	-	-	-	15.5	B	-	-	-	9.4	A	-	-	-	17.8	B	-	-										
E River Rd & Jefferson *Signalized*	EB-L	0.44	5.9	A	43	45	0.23	6.8	A	6	10	0.46	6.8	A	50	51	0.23	7.6	A	8	14	0.41	11.4	B	58	66	0.19	8.8	A	4	10
	EB-T	0.64	8.3	A	226	215	0.33	7.9	A	104	141	0.56	9.4	A	230	228	0.35	9.3	A	136	175	0.63	15	B	198	313	0.31	5.2	A	27	57
	EB-R	0.69	3.6	A	46	37	0.35	3.7	A	35	47	0.71	4.2	A	59	48	0.39	4.9	A	82	158	0.72	7.4	A	90	87	0.37	1.3	A	0	0
	WB-L	0.46	30.7	C	27	73	0.31	20.6	C	35	75	0.52	37.2	D	29	89	0.38	23.7	C	44	92	0.5	40.7	D	28	105	0.35	20.4	C	41	86
	WB-TR	0.19	14.1	B	53	72	0.87	29.1	C	324	393	0.20	15.3	B	56	76	0.91	34.1	C	339	447	0.22	18.8	B	56	98	0.83	26.1	C	317	385
	NB-L	0.82	53.7	D	143	204	0.88	51.6	D	165	254	0.85	53.8	D	167	236	0.91	55.1	E	174	271	0.99	80.2	F	174	271	0.87	49.8	D	171	259
	NB-T	0.41	28.0	C	121	185	0.28	20.6	C	76	128	0.43	26.8	C	132	199	0.29	19.5	B	82	135	0.52	64.5	E	146	226	0.47	33.8	C	109	180
	NB-R	0.17	8.7	A	10	43	0.15	4.6	A	0	30	0.18	8.7	A	12	46	0.15	4.2	A	0	30	0.19	3.9	A	0	24	0.21	3.2	A	0	20
	SB-L	0.16	40.5	D	13	36	0.52	47.6	D	47	96	0.16	40.5	D	13	36	0.47	42.7	D	45	93	0.09	22.9	C	10	25	0.38	27.3	C	35	69
	SB-T	0.72	58.4	E	111	184	0.84	64.4	E	129	250	0.75	60.3	E	117	203	0.86	62.9	E	150	282	0.39	40.9	D	60	84	0.78	57.0	E	80	144
	SB-R	0.11	3.7	A	0	14	0.74	33.7	C	138	261	0.11	3.7	A	0	14	0.69	29.8	C	133	232	0.08	0.3	A	0	0	0.74	28.9	C	106	208
	Intersection	-	17.0	B	-	-	-	28.2	C	-	-	-	18.6	B	-	-	-	30.6	C	-	-	-	24.5	C	-	-	-	25.8	C	-	-

FIGURE 5.3 – 2025 LOS Table

		2030 Base										2030 Build										2030 Build Mitigation									
		AM Peak Hour					PM Peak Hour					AM Peak Hour					PM Peak Hour					AM Peak Hour					PM Peak Hour				
Intersection	LANE GROUP	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
E River Rd & 253 *Signalized*	EB-LTR	0.84	36.1	D	184	317	0.45	23.1	C	62	112	0.85	36.9	D	190	321	0.46	23.3	C	63	112	0.70	20.9	C	111	243	0.45	23.1	C	61	112
	WB-LTR	0.27	13.6	B	25	58	0.34	31.1	C	155	254	0.26	14.3	B	26	57	0.80	31.5	C	160	256	0.22	8.6	A	15	48	0.79	31.1	C	155	256
	NB-LTR	0.87	26.0	C	340	532	0.48	14.3	B	119	198	0.88	26.7	C	350	563	0.49	14.4	B	123	200	Movement Does Not Exist					Movement Does Not Exist				
	NB-LT	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					0.68	19.8	B	153	328	0.33	13.7	B	84	139
	NB-R																					0.37	3.5	A	4	48	0.17	2.7	A	0	27
	SB-LT	0.31	11.5	B	49	88	0.48	26.5	C	262	416	0.36	12.2	B	55	99	0.82	27.3	C	383	427	0.49	18.4	B	50	132	0.81	26.2	C	264	418
	SB-R	0.11	2.2	A	0	19	0.48	3.7	A	11	53	0.11	2.2	A	0	19	0.36	3.7	A	21	54	0.14	3.4	A	0	25	0.36	3.8	A	12	54
	Intersection	-	25.8	C	-	-	-	22.2	C	-	-	-	26.4	C	-	-	-	22.6	C	-	-	-	15.6	B	-	-	-	21.3	C	-	-
E River Rd & Brooks *Unsignalized*	WB-L	0.35	46.7	E	-	36	1.45	325.8	F	-	263	0.41	56.2	E	-	44	1.52	358.8	F	-	276	No Mitigation					No Mitigation				
	WB-R	0.26	24.5	C	-	25	0.10	11.8	B	-	8	0.30	26.5	C	-	30	0.11	11.9	B	-	9										
	NB-T	0.66	0.0	A	-	0	0.28	0.0	A	-	0	0.68	0.0	A	-	0	0.29	0.0	A	-	0										
	NB-R	0.10	0.0	A	-	0	0.05	0.0	A	-	0	0.10	0.0	A	-	0	0.05	0.0	A	-	0										
	SB-L	0.04	12.0	B	-	4	0.08	8.9	A	-	7	0.06	12.4	B	-	5	0.08	8.9	A	-	7										
	SB-T	0.18	0.0	A	-	0	0.60	0.0	A	-	0	0.19	0.0	A	-	0	0.61	0.0	A	-	0										
	Intersection	-	2.3	A	-	-	-	25.5	D	-	-	-	2.7	A	-	-	-	28.0	D	-	-										
E River Rd & Lehigh Station *Signalized*	EB-L	0.43	47.6	D	18	50	0.90	65.5	E	116	254	0.49	59.8	E	21	65	0.91	68.1	E	115	254	0.38	40.2	D	16	48	0.73	43.2	D	61	159
	EB-TR	0.06	21.9	C	8	28	0.29	16.9	B	61	113	0.06	25.8	C	9	31	0.29	16.4	B	59	110	0.05	19.2	B	7	26	0.23	14.8	B	32	83
	WB-L	0.68	43.0	D	113	193	0.62	30.8	C	114	199	0.82	60.2	E	153	284	0.65	31.2	C	119	207	0.65	35.9	D	119	206	0.62	28.0	C	95	204
	WB-TR	0.88	44.3	D	169	333	0.47	5.0	A	8	65	0.99	70.8	E	225	430	0.48	4.9	A	7	65	0.80	31.6	C	159	314	0.50	5.2	A	6	65
	NB-L	0.06	9.6	A	11	26	0.06	22.4	C	5	19	0.0.6	8.6	A	11	25	0.06	23.2	C	5	19	0.08	12.2	B	12	30	0.06	26.1	C	4	22
	NB-TR	0.97	40.4	D	503	815	0.85	41.9	D	232	400	1.00	47.1	D	631	972	0.89	46.4	D	245	428	Movement Does Not Exist					Movement Does Not Exist				
	NB-T	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					0.78	24.2	C	305	451	0.57	31.0	C	109	238
	NB-R																					0.36	2.8	A	0	42	0.37	6.2	A	0	54
	SB-L	0.72	33.0	C	45	143	0.88	42.5	D	138	302	0.96	77.0	E	82	228	0.92	51.3	D	156	334	0.60	15.9	B	43	96	0.60	15.4	B	87	207
	SB-T	0.69	5.4	A	32	55	0.69	19.9	B	267	395	0.14	5.0	A	32	54	0.69	20.6	C	276	409	0.15	6.8	A	38	64	0.69	19.3	B	209	462
	SB-R	0.65	1.4	A	0	25	0.05	4.2	A	1	16	0.23	1.2	A	0	23	0.05	4.4	A	1	16	0.25	1.7	A	0	28	0.05	5.3	A	1	18
	Intersection	-	33.1	C	-	-	-	29.3	C	-	-	-	46.6	D	-	-	-	31.8	C	-	-	-	19.5	B	-	-	-	18.7	B	-	-
E River Rd & Chesapeake Landing/ Bailey *Signalized*	EB-LT	0.44	38.2	D	59	112	0.10	21.5	C	20	48	0.42	36.9	D	58	111	0.10	22.1	C	20	49	No Mitigation					No Mitigation				
	EB-R	0.06	0.3	A	0	0	0.03	0.1	A	0	0	0.07	0.3	A	0	0	0.03	0.1	A	0	0										
	WB-LT	0.89	74.8	E	114	244	0.73	36.5	D	142	252	0.93	79.0	E	127	266	0.75	38.5	D	149	288										
	WB-R	0.27	8.7	A	0	42	0.49	5.2	A	0	60	0.26	8.3	A	0	41	0.50	5.3	A	0	61										
	NB-L	0.02	9.5	A	3	11	0.13	17.7	B	8	25	0.04	10.2	B	4	14	0.14	17.5	B	8	26										
	NB-T	0.91	32.8	C	428	706	0.67	24.2	C	222	352	0.93	37.0	D	451	732	0.67	23.9	C	230	346										
	NB-R	0.23	2.1	A	0	30	0.32	3.4	A	0	43	0.25	2.2	A	0	32	0.32	3.3	A	0	42										
	SB-L	1.04	85.6	F	166	337	0.22	8.2	A	21	45	1.05	88.5	F	167	338	0.22	8.0	A	22	43										
	SB-TR	0.38	6.0	A	93	139	0.78	19.3	B	291	478	0.39	6.5	A	101	150	0.78	19.0	B	303	465										
	Intersection	-	34.5	C	-	-	-	18.2	B	-	-	-	36.8	D	-	-	-	18.3	B	-	-										
E River Rd & Meadows / RIT *Signalized*	EB-LTR	0.29	31.6	C	26	67	0.12	19.3	B	10	37	0.29	31.6	C	26	67	0.12	19.3	B	10	37	0.29	31.4	C	26	67	0.12	18.8	B	9	36
	WB-LT	0.13	36.5	D	14	40	0.62	39.4	D	81	161	0.13	36.6	D	14	40	0.62	39.6	D	82	161	0.13	36.3	D	14	40	0.61	37.6	D	77	158
	WB-R	0.03	0.2	A	0	0	0.17	8.8	A	0	32	0.03	0.2	A	0	0	0.17	8.8	A	0	32	0.03	0.2	A	0	0	0.16	8.5	A	0	32
	NB-LTR	0.77	10.1	B	289	497	0.80	15.7	B	288	530	0.77	10.2	B	293	505	0.80	15.9	B	292	535	Movement Does Not Exist					Movement Does Not Exist				
	NB-L	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					0.01	2.4	A	1	3	0.06	5.9	A	3	11
	NB-TR																					0.77	10.2	B	289	506	0.78	15.1	B	269	514
	SB-LTR	0.59	6	A	158	243	0.74	13.7	B	238	433	0.59	6.1	A	161	248	0.74	13.8	B	242	438	Movement Does Not Exist					Movement Does Not Exist				
	SB-L	Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					Movement Does Not Exist					0.12	3.8	A	3	11	0.21	8.7	A	7	25
	SB-TR																					0.54	5.3	A	143	219	0.66	11.4	B	201	371
	Intersection	-	9.5	A	-	-	-	16.8	B	-	-	-	9.5	A	-	-	-	16.9	B	-	-	-	9.2	A	-	-	-	15.3	B	-	-
E River Rd & Jefferson *Signalized*	EB-L	0.41	11.5	B	58	66	0.19	8.8	A	4	10	0.41	11.4	B	59	67	0.20	8.7	A	4	10	No Mitigation					No Mitigation				
	EB-T	0.63	15.1	B	200	313	0.31	5.5	A	27	57	0.64	15.3	B	216	314	0.33	6.0	A	28	58										
	EB-R	0.72	7.5	A	91	88	0.37	1.3	A	0	0	0.73	7.0	A	91	87	0.38	1.4	A	0	0										
	WB-L	0.5	40.8	D	28	106	0.35	20.4	C	41	86	0.52	42.7	D	29	107	0.36	22.6	C	42	92										
	WB-TR	0.22	18.8	B	56	98	0.83	26.1	C	317	385	0.22	19.3	B	57	99	0.87	29.8	C	326	447										
	NB-L	0.99	81.1	F	174	273	0.88	50.1	D	172	261	0.94	68.5	E	174	264	0.85	46.9	D	171	253										
	NB-T	0.53	34.5	C	146	226	0.47	33.8	C	110	181	0.52	34.0	C	145	228	0.43	30.7	C	105	173										
	NB-R	0.19	3.8	A	0	24	0.21	3.2	A	0	20	0.19	3.8	A	0	24	0.19	2.8	A	0	19										
	SB-L	0.09	22.9	C	10	25	0.38	27.3	C	35	69	0..09	22.9	C	10	25	0.35	24.5	C	33	65										
	SB-T	0.39	40.8	D	61	85	0.78	57.2	E	80	144	0.40	41.5	D	61	86	0.66	46.5	D	78	120										
	SB-R	0.08	0.3	A	0	0	0.74	28.9	C	106	208	0.09	0.3	A	0	0	0.71	26.2	C	105	200										
	Intersection	-	24.7	C	-	-	-	25.9	C	-	-	-	23.1	C	-	-	-	26.0	C	-	-										

FIGURE 5.4 – 2030 LOS Table

2035 Base											
Intersection	LANE GROUP	AM Peak Hour					PM Peak Hour				
		V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)	V/C Ratio	Delay	Level of Service	50th Queue (ft)	95th Queue (ft)
E River Rd & 253 *Signalized*	**EB-LTR**	0.72	22.7	C	122	253	0.47	24.1	C	63	115
	WB-LTR	0.22	9.2	A	16	51	0.81	33.1	C	161	283
	NB-LT	0.69	19.7	B	170	337	0.34	13.4	B	86	138
	NB-R	0.38	4.0	A	10	55	0.17	2.6	A	0	26
	SB-LT	0.49	17.9	B	53	131	0.82	26.8	C	287	438
	SB-R	0.13	3.1	A	0	24	0.36	3.9	A	16	56
	Intersection	-	16.3	B	-	-	-	22.2	C	-	-
E River Rd & Brooks *Unsignalized*	**WB-L**	0.46	65.7	F	-	50	1.67	431.8	F	-	295
	WB-R	0.32	29.0	D	-	33	0.10	12.0	B	-	8
	NB-T	0.72	0.0	A	-	0	0.30	0.0	A	-	0
	NB-R	0.10	0.0	A	-	0	0.05	0.0	A	-	0
	SB-L	0.06	12.8	B	-	5	0.08	9.0	A	-	7
	SB-T	0.20	0.0	A	-	0	0.64	0.0	A	-	0
	Intersection	-	3.0	A	-	-	-	32.4	D	-	-
E River Rd & Lehigh Station *Signalized*	**EB-L**	0.35	35.6	D	15	44	0.81	47.5	D	104	243
	EB-TR	0.05	18.0	B	7	24	0.28	15.2	B	56	112
	WB-L	0.69	36.5	D	111	195	0.61	27.5	C	112	209
	WB-TR	0.82	31.0	C	139	291	0.46	4.5	A	7	63
	NB-L	0.07	10.8	A	11	27	0.08	28.3	C	6	22
	NB-T	0.80	23.6	B	283	435	0.61	34.8	C	142	247
	NB-R	0.36	2.7	A	0	40	0.38	6.3	A	0	54
	SB-L	0.63	18.0	A	37	112	0.67	20.3	C	120	217
	SB-T	0.16	6.1	B	34	59	0.78	25.7	C	304	523
	SB-R	0.25	1.6	B	0	27	0.05	6.0	A	2	19
	Intersection	-	19.3	B	-	-	-	22.3	C	-	-
E River Rd & Chesapeake Landing/ Bailey *Signalized*	**EB-LT**	0.65	54.0	D	62	139	0.10	21.6	C	20	48
	EB-R	0.08	0.5	A	0	0	0.03	0.1	A	0	0
	WB-LT	1.17	155.6	F	154	296	0.74	37.6	D	151	279
	WB-R	0.30	9.5	A	0	43	0.49	5.2	A	0	60
	NB-L	0.04	10.1	B	4	14	0.15	18.6	B	9	27
	NB-T	0.99	48.4	D	530	827	0.68	24.7	C	235	363
	NB-R	0.25	2.1	A	0	32	0.32	3.4	A	0	43
	SB-L	0.92	54.2	D	143	306	0.22	8.4	A	22	45
	SB-TR	0.38	5.2	A	87	130	0.80	20.5	C	318	504
	Intersection	-	43.6	D	-	-	-	18.9	B	-	-
E River Rd & Meadows / RIT *Signalized*	**EB-LTR**	0.16	31.6	C	27	67	0.12	19.2	B	9	37
	WB-LT	0.16	36.7	D	15	41	0.63	39.1	D	80	163
	WB-R	0.16	0.2	A	0	0	0.17	8.7	A	0	32
	NB-L	0.82	2.4	A	1	3	0.06	5.7	A	3	11
	NB-TR	0.82	10.6	B	300	533	0.79	15.1	B	280	511
	SB-L	0.82	4	A	3	11	0.21	8.6	A	7	24
	SB-TR	0.82	5.3	A	147	225	0.67	11.3	B	209	368
	Intersection	-	9.4	A	-	-	-	15.4	B	-	-
E River Rd & Jefferson *Signalized*	**EB-L**	0.44	5.9	A	44	46	0.19	8.3	A	4	11
	EB-T	0.63	8.1	A	204	211	0.32	5.8	A	28	57
	EB-R	0.71	3.6	A	57	62	0.38	1.4	A	0	0
	WB-L	0.49	30.5	C	24	71	0.36	22.9	C	41	95
	WB-TR	0.19	12.4	B	46	64	0.87	30.0	C	318	465
	NB-L	0.83	47.0	D	150	214	0.92	57.0	E	177	277
	NB-T	0.58	35.8	D	130	259	0.44	31.3	C	106	175
	NB-R	0.20	3.3	A	0	20	0.20	2.9	A	0	19
	SB-L	0.11	23.8	C	9	26	0.33	24.2	C	33	66
	SB-T	0.65	51.1	D	57	92	0.61	43.5	D	77	118
	SB-R	0.11	0.5	A	0	0	0.68	23.9	C	104	188
	Intersection	-	16.7	B	-	-	-	27.1	C	-	-

FIGURE 5.5 – 2035 LOS Table

Intersection Capacity Improvements

2015

The NB approach to Jefferson Road is currently experiencing capacity issues with queue's extending beyond the left turn lane storage. This is the only intersection with capacity issues under 2015 conditions.

2020

A substantial amount of development is included in the 2020 volumes with the largest impacts to the Lehigh Station and Bailey Road intersections. Traffic heading toward either I-390 or West Henrietta Road is reflected in the need for NB right turn lanes.

The increased queue lengths at the Bailey Road/Chesapeake Landing Intersection will extend beyond the existing storage bays requiring increases to the current storage lengths for the NB left turn, SB left turn, WB.

As previously shown in Table 7 the Lehigh Station intersection includes the re-alignment of the former Kodak Riverwood Campus northern driveway which provides a new EB approach. The new EB approach would include a left turn lane and a thru/right lane. It is anticipated that the developer would construct the new EB approach and turn lanes at this intersection due to the proposed driveway re-alignment.

A SB left turn lane, NB right turn lane and WB right turn lane are proposed at the unsignalized Brooks Road intersection. Unsignalized analysis predicts tight conditions but often over estimate delays. The need for a signal should be monitored as traffic conditions change.

The SB right turn lane at the Erie Station intersection should be extended due to the potential for SB thru queues to block access to the right turn lane.

2025

As the volumes increase to 2025 we incur additional delays on the WB approach at the unsignalized Brooks Road intersection. Increasing the WB right turn lane length will improve LOS for this approach however the left turn movement is LOS 'F' and the need for signalization should be monitored as projected development progresses.

A new 500' NB right turn lane at the Bailey Road/Chesapeake Landing intersection will be required due to increases in volume.

Traffic at the north end of the corridor has increased requiring a 2nd SB thru lane at Jefferson Road to provide sufficient capacity at this congested intersection.

2030

Under 2030 conditions the Erie Station intersection requires a new NB Right Turn lane.

As stated under 2025 conditions the need for signalization at Brooks should be monitored as the WB approach at Brooks is LOS 'F'.

With additional student housing and increased thru volumes the RIT driveway now includes NB/SB left turn lanes and an increased WB right turn lane.

Intersection Capacity Improvements (cont.)

2035

The Town has not identified any long term development post 2030 therefore there are no potential intersection improvements in 2035.

Roundabouts

An alternative planning solution that may also address the proposed intersection capacity mitigation is installation of a roundabout. Roundabouts typically occupy a larger footprint than a standard 4-way intersection thus requiring additional Right-of-Way for construction but this may be possible where developer owned lands are located adjacent to the proposed intersection. Overall costs may be similar due to avoiding the construction of turn lanes and signalization. Due to topography some of the intersections may not be practical for a roundabout as may be the case at the Lehigh Station Road intersection.

Conceptual Improvements

Concept sketches were developed for each of the identified intersection capacity improvements based on the following design parameters:

- Design Speed = 45 mph
- Lane Width = 11'
- Length of Shift Tapers = Width * Speed (45mph)
- Turn Bay Tapers = 75'
- Minimum shoulder width = 6' (8' desirable per NYSDOT HDM Exhibit 2-3)

Intersection improvement concepts for each analysis year are shown in Appendix C. These concepts do not include any required highway improvements at the future development driveways (except at Lehigh Station Road) which may require additional roadway improvements/turn lanes as required by MCDOT.

Linear Corridor Analysis

HCM Exhibit 10-7 provides example service volumes for Urban Streets based on Roadway Class I thru IV. Roadway class is defined by free flow speed/signal spacing/cycle length etc. Based on the signal spacing and free-flow speed characteristics of East River Road, it would fall somewhere between a Class I and Class II roadway. For a 2-lane roadway LOS 'D' is estimated as 2,030 veh/hour for Class I and 1,700 veh/hour for Class II roadways. The 2-way year 2025 full build peak hour volumes are more than 1,500 vehicles north of Brooks Road with a maximum of ~1,800 vehicles at the River Meadow Drive/Farnum Lane(RIT) intersection. Based on the volumes in HCM Exhibit 10-7 the future conditions are approaching the capacity of a 2-lane roadway.

The areas with significant driveways that may benefit from a TWLTL include the segment between the Farnum Lane/River Meadow intersection and the southern unsignalized RIT driveway. In this section, there are more than 21 driveways per mile, several side streets and both a horizontal and vertical curve that may limit sight distance.

Intersection improvements were identified based on maintaining acceptable LOS conditions and where volume thresholds were exceeded for turn lanes or signalization. See Table 7 below for a summary of intersection capacity improvements.

Table 7 – Summary of Intersection and Corridor Capacity Improvements

Intersection	**Recommended Capacity Improvements**				
East River Road - CR 84 at:	**2015 (Existing)**	**2020 (Full Build)**	**2025 (Full Build)**	**2030 (Full Build)**	**2035 (Full Build)**
Erie Station Road - NYS 253 (NYSDOT Intersection)	None	➢ Extend SB RT Lane by 225' from 200' to 425'	No Additional	➢ New 300' NB RT Lane	No additional
Brooks Road - CR 77 (MCDOT Intersection)	None	➢ New 100' SB LT Lane ➢ New 100' NB RT Lane ➢ New 150' WB LT Lane	The unsignalized capacity analysis predicts potentially long delays for the WB left turn movement. However unsignalized analyses are known to exaggerate such delays therefore it is recommended that this unsignalized intersection is monitored for a possible traffic signal as traffic conditions change.		
Lehigh Station Road - CR 79 (MCDOT Intersection)	None	➢ New 450' NB LT Lane. ➢ Re-stripe SB LT Lane ➢ Re-stripe SB RT Lane ➢ 200' WB LT Lane. ➢ 200' EB LT Lane (New driveway). ➢ Remove Riverwood Drive (Development). ➢ Replace Traffic Signal	No additional	➢ New 450' NB RT Lane	No additional
Bailey Road - CR 81/Chesapeake Landing (MCDOT Intersection)	None	➢ Extend NB Left Turn Lane via re-striping T-W-L-T-L ➢ Extend SB LT Lane by 355' from 120' to 475' ➢ Extend WB RT Lane by 110' from 190' to 300'	➢ New 500' NB Right Turn Lane.	No additional	No additional
River Meadow/Farnum Lane (RIT) (MCDOT Intersection)	None	None	None	➢ New 500' NB LT Lane ➢ New 350' SB LT Lane ➢ Extend WB RT by 100' from 70' to 170'	No additional
Jefferson Road - NYS 252 (NYSDOT Intersection)	None	➢ New 2nd NB LT or Thru Lane	➢ New 2nd SB Thru Lane.	No additional	No additional
Corridor Improvements	**Recommended Corridor Improvements**				
Farnum Lane to Minett Drive	None	None	Two-Way-Left-Turn-Lane	None	None
Sidewalks	Future Sidewalks are a long term improvement goal due to environmental and R.O.W. constraints				

Improvement Funding Legend

Developer Cost Sharing Funded Improvements
Kodak Riverwood Development Improvements
MCDOT Improvements

CONCLUSIONS AND RECOMMENDATIONS

Corridor Capacity and Safety Improvements

The intersection improvements noted above will need to be incorporated prior to the respective development year in order to maintain acceptable LOS conditions along East River Road. Where incremental increases in turn bay lengths are required the full storage lengths should be constructed to minimize construction impacts. Each individual development may also require a separate traffic study to identify any additional capacity or safety improvements necessary at each development driveway, as determined by MCDOT.

A two-way left turn lane (TWLTL) is recommended in areas with thru volumes exceeding 900 vehicles/hour that also contain a concentration of residential and commercial driveways. Without a TWLTL left turning vehicles in these areas will block thru traffic which may increase the likelihood of rear-end crashes. In looking at the entire corridor the segment with the highest concentration of residential and commercial driveways is located between the Farnum Lane (RIT)/River Meadow Intersection and the unsignalized southern RIT driveway. Horizontal and vertical curves also limit visibility of left turning vehicles. A 3-lane roadway section would begin at the southern end as an extension of the proposed SB left turn lane at Farnum Lane and end with a new SB left turn lane at the unsignalized RIT driveway. This 3-lane section would be in addition to the intersection improvements identified above. Widened shoulders are already being installed between the Bailey Ave/Chesapeake signal and Farnum Lane/River Meadow intersection. A concept for a 3-lane section (TWLTL) is shown in Appendix C. Additional linear capacity in other areas south of Farnum Lane/River Meadow may be necessary dependent on future volumes and driveway locations.

Pedestrian Accommodations

Pedestrians are currently using the existing shoulders to travel within the East River corridor due to a lack of sidewalks. Pedestrian volumes are expected to increase with future residential development and proximity to RIT. As noted in the existing conditions sections, there are several current residential developments that provide sidewalk connections to East River Road. In such a situation, ADAAG requires that accessible design standards be used to design the segments of the shoulders that are intended to serve as walkways. This means that these segments of the shoulder must meet the ADAAG 2% maximum cross slope requirements. This conflicts with the normal 6% shoulder cross slope and may result in technical infeasibilities where the cross slope of the traveled way exceeds 2% (i.e., the insides of curves). The Town of Henrietta Active Transportation Plan identified the following priority sidewalk areas within the project corridor:

- East Side of East River Road from Brooks to Farnum Lane
- West side of East River Road from Farrell Road Extension to River Meadow Drive

Installation of new sidewalks should be a priority in this corridor given the future residential, student housing and senior housing development however this may be more of a long term goal due to funding concerns and the potential environmental/R.O.W. impacts. Both the Town and County consider improved shoulders a short term solution that may be beneficial in areas with a two-way left turn lane where vehicles are not encouraged to by-pass left turning vehicles on the shoulders. Future sidewalk costs should include installation of x-walks and pedestrian signals at the existing signalized intersections. Future pedestrian signal timings were not included in the capacity analysis.

Bicycle Accommodations

The existing shoulders are currently being used by bicyclists within the corridor with the number of bicyclists expected to increase with development. Per the NYSDOT Highway Design Manual (HDM) shoulders that are well designed for bicycling will also have maintenance, safety and other benefits that affect other highway users. AASHTO defines paved shoulder, together with the adjacent travel lane, as shared use facilities on roadways where bicycling is permitted. The minimum shoulder width on a project to specifically accommodate bicycling should be 4 ft. The HDM states that roadways that include long, steep grades should also consider providing additional width on the downhill shoulders. Bicyclists traveling downhill frequently will reach high rates of speed and may find that narrow shoulders 4 ft. or less, are unusable when debris and litter have accumulated on them, or bicyclists may not trust unseen shoulder conditions ahead. Consistent shoulder widths in excess of 4' should be considered within the corridor due to rolling terrain and the expected increase in users. The planned shoulder width increases between Fairwood Drive and Farnum Lane will improve bicycle conditions in this area. Widening the shoulders north of Farnum Lane should also be considered.

Transit Service

Providing transit service along East River Road should be evaluated as student housing options grow in the corridor and in concert with any future corridor pedestrian accommodations.

Other Considerations

The East River Road corridor includes other existing driveways and geometric features that should be reviewed as volumes and development increase. Several existing unsignalized intersections within the corridor may experience significant delays due to future corridor volumes. Some of these impacts cannot be avoided however access restrictions could be implemented where alternate signalized access exists. RIT for example has three (3) driveways along East River Road with the two (2) northern most driveways being unsignalized. Southbound vehicles exiting RIT have the option of using the traffic signal at Farnum Lane. This alternate access would facilitate either restricting left turns onto East River Road from the two (2) northernmost driveways or providing signing directing Southbound vehicles to the Farnum Lane exit. This could also apply to the Still Pond/Cape Henry/Chesapeake Landing Residential neighborhood.

Sight distance along the corridor is limited in areas due to the rolling terrain. Any future roadway improvements and future development driveways will need to take this into consideration and any remaining non-standard features justified thru the approval process.

COST SHARING

Highway improvement cost sharing is a mechanism that allows for both public and private investment to maintain a safe and efficient highway over the next 20 years. As development occurs along East River Road one way to mitigate for the projected capacity improvements is to develop equitable cost shares based on trip generation rates and development area. Working with the Town and County this process will define 'fair' shares that include both existing capacity improvements (Town/County responsibility) as well as development generated capacity improvements. A Transportation Development District (TDD) is the anticipated funding mechanism for these improvements. Estimated costs for each improvement are shown below in Table 8.

Table 8 – Opinion of Probable Costs for Corridor Improvements

Intersection East River Road (CR 84) at:	Cost
Erie Station Road (NYS 253)	$420,000
Brooks Road (CR 77)	$640,000
Lehigh Station Road (CR 79)	$150,000
Bailey Road (CR 81)/Chesapeake Landing	$650,000
River Meadow/Farnum Lane (RIT)	$770,000
Jefferson Road (NYS 252)	$2,700,000
TWLTL: Farnum Lane/River Meadow to Minett Drive (RIT)	**County Funded**
Total =	**$5,330,000**

Note: Does not include R.O.W., Private Utility relocation, Wetlands/Environmental Mitigation or NYSDOT Permit Fees. 2016 Costs.