

**EXHIBIT 9**

**TRAFFIC REPORT**

---

**DRAFT**

# **TRAFFIC IMPACT STUDY SUPPLEMENT**

**Midtown Development  
105 Somerset Street  
Portland, Maine**

Prepared for  
The Federated Companies  
3301 NE 1<sup>st</sup> Avenue, Suite M-302  
Miami, FL 33137-4110

Prepared by



**Fay, Spofford & Thorndike, LLC**  
Engineers • Planners • Scientists  
Portland, Massachusetts

November 2014



**Table of Contents**

	<b><u>Page</u></b>
<b>1.0 OVERVIEW .....</b>	<b>4</b>
1.1 Executive Summary .....	4
1.2 Site Description and Site Plan.....	5
<b>2.0 TRIP GENERATION/ASSIGNMENT.....</b>	<b>7</b>
2.1 Trip Generation .....	7
2.2 Post Development Traffic.....	8
<b>3.0 CAPACITY ANALYSIS .....</b>	<b>13</b>
3.1 Operating Conditions .....	14
<b>4.0 CONCLUSION .....</b>	<b>24</b>

**Appendix**

Trip Generation Calculation  
Synchro /SimTraffic Results

**List of Figures**

<b><u>Figure</u></b>	<b><u>Page</u></b>
Figure 1 – Site Plan.....	6
Figure 2 – AM Peak Hour Site Generated Trips.....	9
Figure 3 – PM Peak Hour Site Generated Trips .....	10
Figure 4 – 2018 Post Development AM peak Hour Traffic Volumes .....	11
Figure 5 – 2018 Post Development PM peak Hour Traffic Volumes.....	12

**List of Tables**

<b><u>Table</u></b>	<b><u>Page</u></b>
Table 1 – Trip Generation – Previous Development Proposal .....	7
Table 2 – Trip Generation – Current Development Proposal .....	7
Table 3 – Intersection Level of Service Criteria.....	13
Sim Traffic Results for Marginal, Preble & Elm.....	15
Sim Traffic Results for Marginal, Preble & Elm.....	15
Sim Traffic Results for Somerset & Chestnut .....	16
Sim Traffic Results for Somerset & Chestnut .....	16
Sim Traffic Results for Somerset & Elm.....	17
Sim Traffic Results for Somerset & Elm.....	17
Sim Traffic Results for Marginal & Franklin .....	18
Sim Traffic Results for Marginal & Franklin .....	18
Sim Traffic Results for Franklin, Somerset & Fox.....	19
Sim Traffic Results for Franklin, Somerset & Fox.....	19
Sim Traffic Results for East Entrance & Somerset St .....	20
Sim Traffic Results for East Entrance & Somerset St .....	20
Sim Traffic Results for Marginal, State, Forest & Kennebec.....	21
Sim Traffic Results for Marginal, State, Forest & Kennebec.....	21
Sim Traffic Results for Somerset & Pearl .....	22
Sim Traffic Results for Somerset & Pearl .....	22
Sim Traffic Results for Marginal, Chestnut & Park and Ride.....	23
Sim Traffic Results for Marginal, Chestnut & Park and Ride.....	23

## **1.0 OVERVIEW**

### **1.1 Executive Summary**

The Federated Companies has retained Fay, Spofford & Thorndike, LLC, (FST) to provide a supplement to the original Traffic Impact Study that was submitted on April 22, 2013 for the proposed Midtown Development to be located at 105 Somerset Street in Portland, ME.

The original Traffic Impact Study was completed for a development that consisted of 664 residential units (544 residential apartments, 120 residential condominiums) as well as 100,000 sf of retail space. The current proposal is smaller and consists of 440 residential apartment units along with 87,200 sf of retail development.

Since the size of the development will be DECREASING, the amount of traffic to be generated by the project will decrease from the original study. This supplement has been prepared to present the changes due to the project. Therefore, this supplement only provides a discussion of the elements of the original study that have changed.

Similar to the original development, the proposed development will consist of a multiuse site composed of apartments, retail space and garage level parking. No turning lanes are required along Somerset Street to accommodate the proposed traffic. The midtown development will include a traffic demand management plan to assist in reducing site-generated traffic impacts.

The same improvements are being proposed as the previous development, consisting of the following:

1. Optimization of signal timings to reduce the impacts of the site generated traffic at most of the study intersections.
2. A new traffic signal is proposed at the intersection of Marginal Way/Chestnut Street & the park and ride lot. This signal has been considered previously by the City of Portland and is desirable with or without the midtown development project.

As shown in the results of this supplement, the implementation of the proposed mitigation will mitigate the traffic impacts of the midtown development.

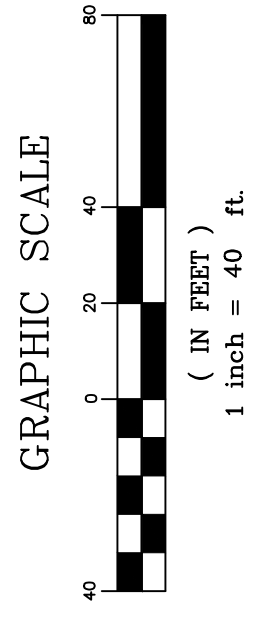
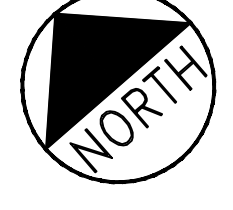
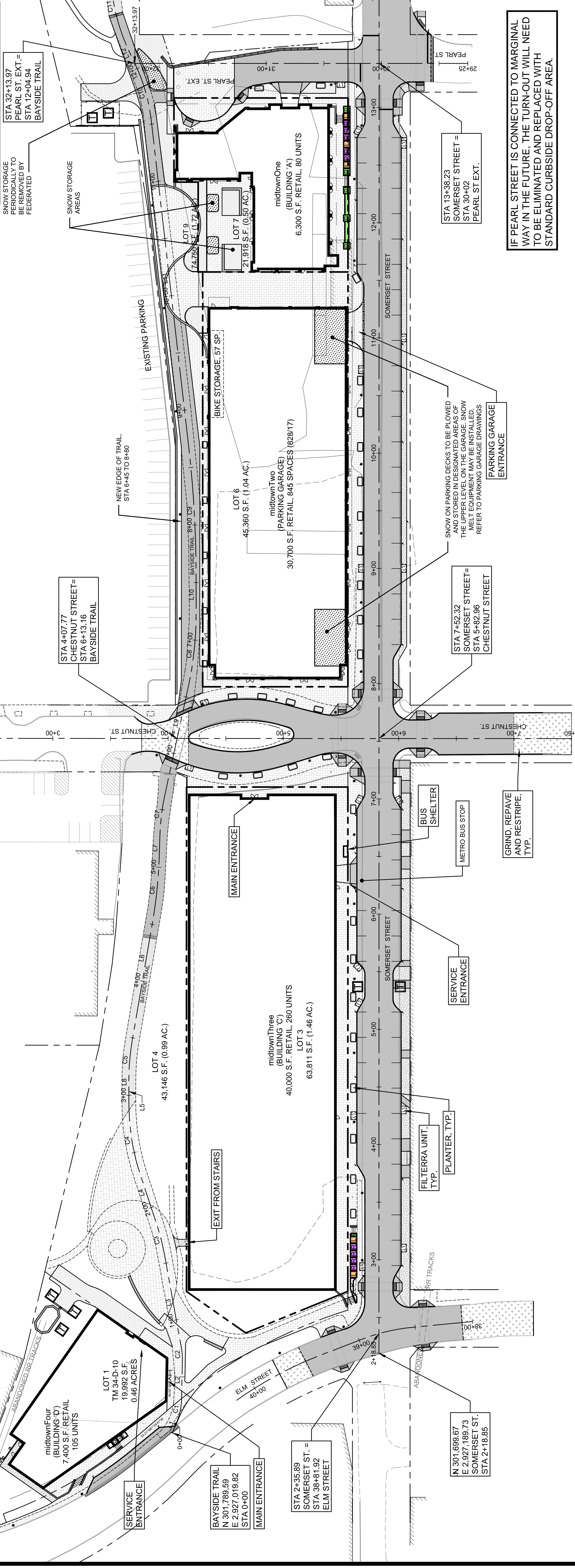
## **1.2 Site Description and Site Plan**

The current site development will consist of four buildings. One parking garage will be constructed as part of the development. The breakout of floor space usage is proposed as 440 residential apartment units and 87,200 sf of retail space. A 700 space parking garage is proposed and will be accessed by a single driveway on Somerset Street. This driveway will serve both entering and exiting traffic. The proposed site plan is shown on the following page.



**LEGEND**

- PROPOSED PROPERTY BOUNDARY
- ABUTTING BUILDING
- FEDERATED BUILDINGS
- HARDSCAPE/LANDSCAPE
- PROPOSED PAVEMENT
- GREEN SPACE/PLANTERS (BY MITCHELL & ASSOCIATES)
- PROPOSED LANDING, PLANTER AND RAMP
- SNOW STORAGE AREA
- EXISTING BRICK TRAIL
- EXISTING HARDSCAPED TRAIL
- EXISTING PAVED TRAIL
- EXISTING GRAVEL PATH



IF PEARL STREET IS CONNECTED TO MARGINAL WAY IN THE FUTURE, THE TURN-OUT WILL NEED TO BE ELIMINATED AND REPLACED WITH STANDARD CURBSIDE DROP-OFF AREA.

**LINE TABLE: ALIGNMENTS**

ID	LENGTH	DIRECTION
L1	11.70	N71°04'02.06"E
L2	34.95	N50°11'33.96"E
L3	82.21	N38°43'25.92"E
L4	44.18	N30°40'45.73"E
L5	20.19	N49°00'22.29"E
L6	106.00	N58°43'25.61"E
L7	21.70	N50°49'52.46"E
L8	20.19	N49°00'22.29"E
L9	95.15	N61°14'33.58"E
L10	32.69	N48°56'24.17"E
L11	284.79	N42°26'52.98"E
L12	13.41	N23°46'17.31"E
L13	50.38	N51°49'50.37"E

**CURVE TABLE: ALIGNMENTS**

ID	RADIUS	ARC LENGTH	DELTA	TANGENT	PC STATION	PT STATION
C1	50.00	18.22	020°52'	9.21	0+11.70	0+29.91
C2	50.00	10.01	011°28'	5.02	0+64.86	0+74.87
C3	200.00	28.08	008°03'	14.06	1+57.08	1+85.16
C4	200.00	63.97	018°20'	32.26	2+29.34	2+93.31
C5	200.00	33.92	009°43'	17.00	3+13.50	3+47.42
C6	400.00	52.25	007°29'	26.16	4+53.42	5+05.66
C7	200.00	36.34	010°25'	18.22	5+27.37	5+63.71
C8	300.00	64.42	012°18'	32.33	6+58.86	7+23.28
C9	1000.00	113.31	006°30'	56.71	7+55.57	8+69.28
C10	150.00	48.90	018°41'	24.67	11+54.07	12+02.96
C11	170.00	83.25	028°04'	42.48	12+16.37	12+99.62

PRELIMINARY - NOT FOR CONSTRUCTION

**FST**  
FAY SPOFFORD & THORNDIKE  
ENGINEERS • PLANNERS • SCIENTISTS  
778 MAIN ST. SUITE B, SOUTH PORTLAND, ME 04106  
FORMERLY DELUCA-HOFFMAN ASSOCIATES

PROJECT: midtown  
PORTLAND, MAINE

SHEET TITLE: OVERALL SITE PLAN

CLIENT: THE FEDERATED COMPANIES

DESIGNED: WGH/SRB SCALE: 1" = 40'

CHECKED: WGH/SRB

FILE NAME: 3062-SITE

DRAWN: KEV/LA DATE: OCTOBER 2014

SCALE: 1" = 40'

JOB NO.: SP-M037B

SHEET: C-2.0

REVISIONS

REV	DATE	DESCRIPTION
1	11.14.14	FINAL LEVEL III SUBMISSION TO CITY OF PORTLAND

P. E. WILLIAM R. MOORE  
LIC. # 13587



## 2.0 TRIP GENERATION/ASSIGNMENT

### 2.1 Trip Generation

Vehicle-trips expected to be generated by the proposed building were obtained from consulting the Institute of Transportation Engineers (ITE) Trip Generation. The ITE *Trip Generation* is widely used by traffic engineers for this application. The manual provides vehicle-trip generation projections for a number of land uses. The data contained in *Trip Generation* have been obtained from the research and experiences of transportation engineering and planning professionals and is based on over 3,700 trip generation studies submitted by public agencies, developers, consulting firms and associations.

Similar to the original study, the retail trip generation is based on land use code #814 (Specialty Retail Center) and land use code #820 (Shopping center), while the residential apartment portion of the site is based on land use code #222 High Rise Apartment. The trip generation results were then reduced to account for shared trips between the land uses based on ITE and National Cooperative Highway Research Program (NCHRP) data and procedures. The same shared trip methodology was used for both the original development plan and the current development plan.

Trip reductions due to TDM (traffic demand management) were calculated based on access to alternative transportation – such as the existing bus stops and access to the Bayside Trail. A 7% credit was taken for the TDM measures. The same TDM reductions were used for both the original development plan and the current development plan.

The previous development proposal consisted of 100,000 gross sq. ft. of retail, 554 apartments and 120 condominiums and was expected to generate 304 and 379 trip ends during the AM and PM peak hours respectively. A follow up memorandum recalculated a slightly larger development to generate 316 and 392 trip ends during the AM and PM peak hours respectively. The Trip Generation from the original study is shown in Table 1 below, while the Trip Generation for the current proposal is shown in Table 2.

**Table 1 – Trip Generation – Previous Development Proposal**

	Entering	Exiting	Total
AM Peak Hour	106	198	304
PM Peak Hour	201	178	379

Source ITE Trip Generation Manual 9<sup>th</sup> edition

**Table 2 – Trip Generation – Current Development Proposal**

	Entering	Exiting	Total
AM Peak Hour	80	123	203
PM Peak Hour	140	135	276

Source ITE Trip Generation Manual 9<sup>th</sup> edition

Table 2 shows the trips estimated to be generated by the current proposal. As shown in Table 2, the current development, which will consist of 87,200 gross sq. ft. of retail and 440 apartments, is expected to generate 203 and 276 trip ends during the AM and PM peak hours respectively. **Therefore, the current proposal will generate 101 fewer trips (26 in/75 out) during the morning peak hour and 103 fewer trips (61 in/43 out) during the weekday evening peak hour than was originally studied. The current proposal is also smaller than the previously revised proposal, and will generate 113 fewer trips (28 in/85 out) during the morning peak hour and 117 fewer trips (69 in/48 out) fewer trips during the weekday evening peak hour.**

## **2.2 Post Development Traffic**

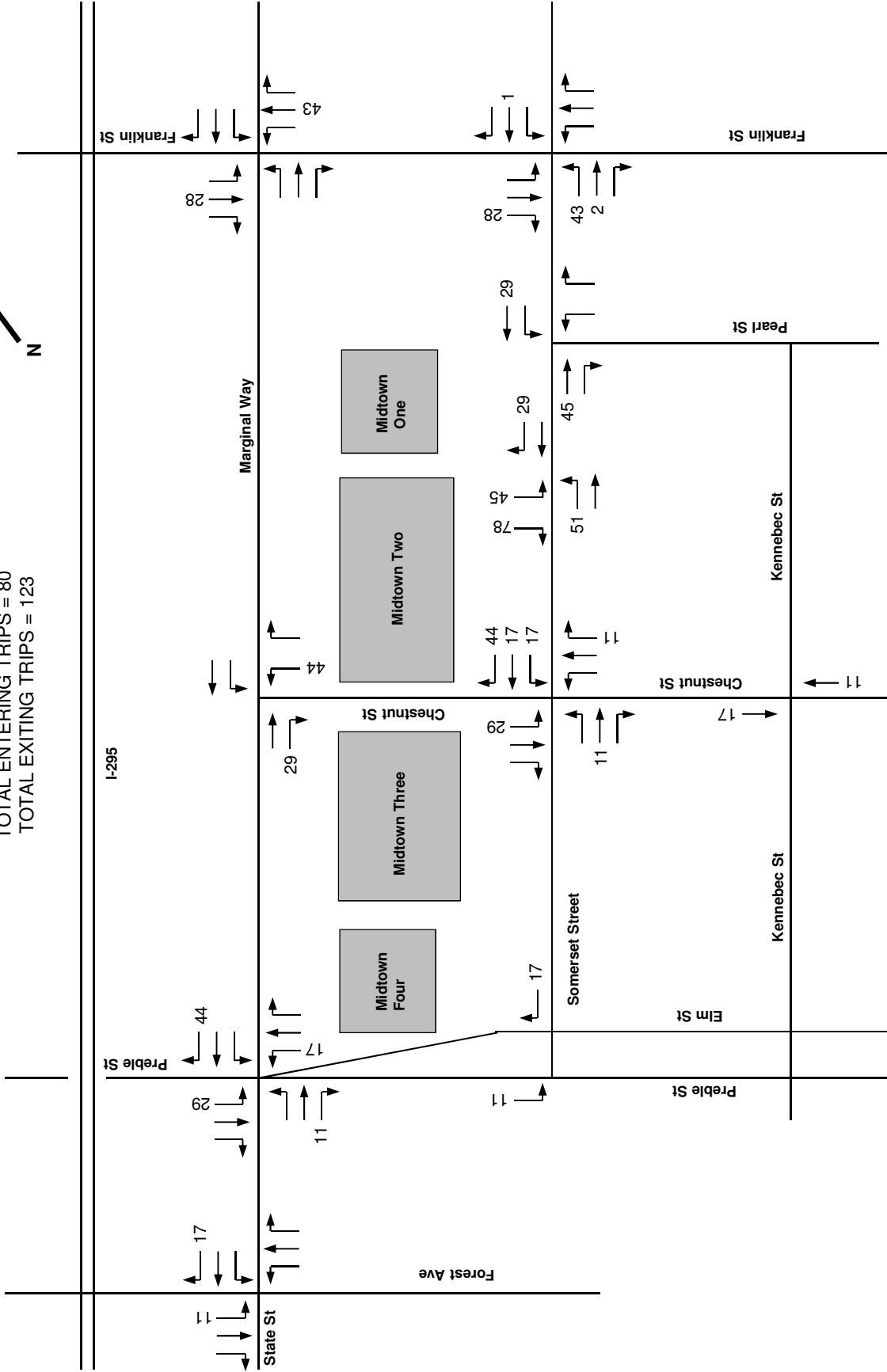
In order to evaluate the effect of the project on traffic in the study area, vehicle-trips associated with the proposed development are projected, distributed and assigned to the adjacent roadway network. These incremental vehicle-trips are added to the Pre Development Condition traffic volumes to form the updated Post Development Condition traffic volume networks for the morning and evening commuter peak hours.

Incremental peak hour traffic volumes expected to be generated by the proposed development have been distributed according to the traffic patterns identified in the original traffic impact study and are presented in Figures 2 and 3.

Year 2018 Post Development peak hour traffic volumes, which consist of the addition of peak hour project generated traffic to 2018 Pre Development traffic volumes, are displayed in Figures 4 and 5.

# Site Generated Trip Ends

AM Peak Hour  
 TOTAL ENTERING TRIPS = 80  
 TOTAL EXITING TRIPS = 123



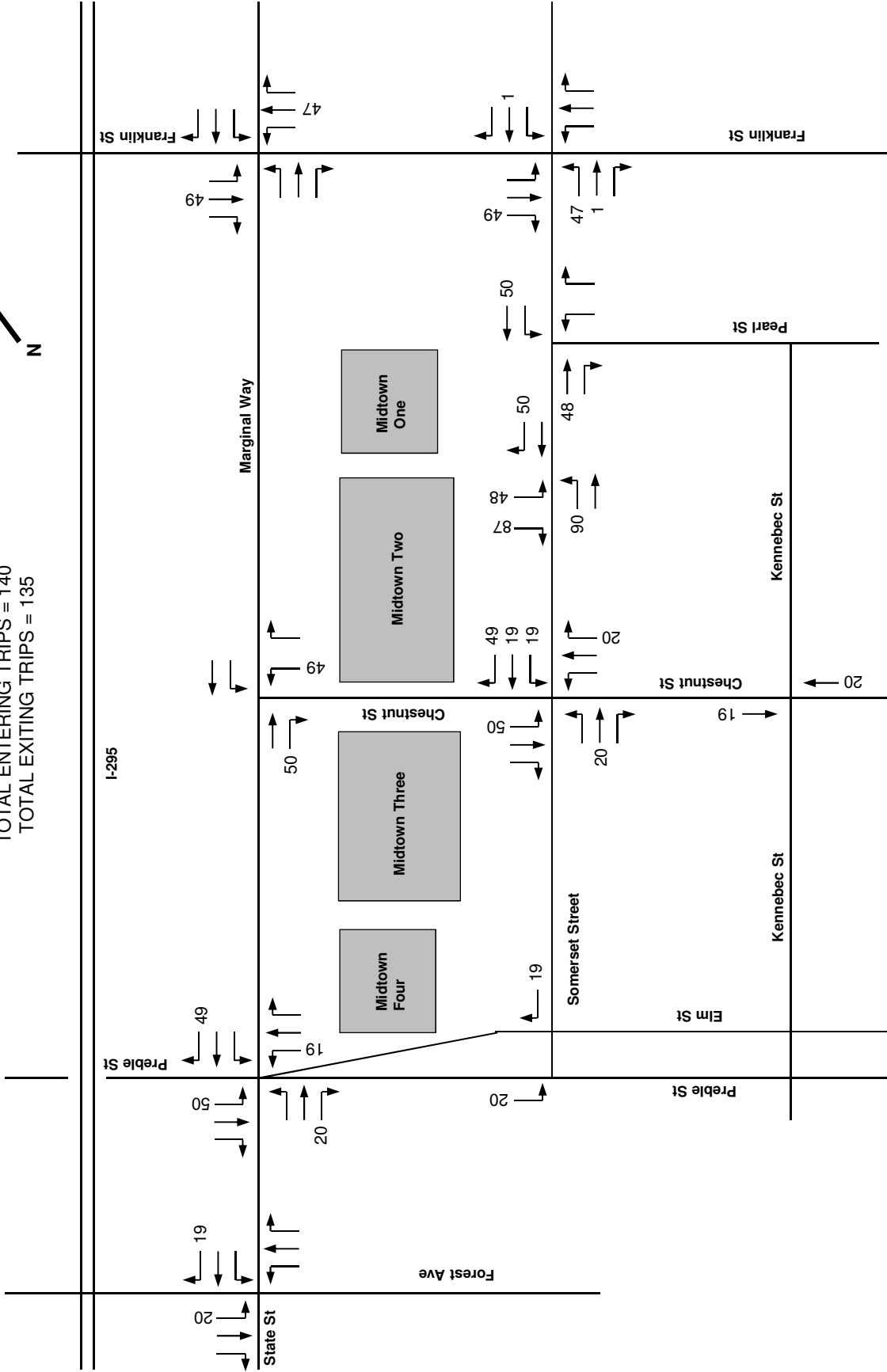
**Figure 2**  
 Not to Scale

### Site Generated Trip Ends

PM Peak Hour

TOTAL ENTERING TRIPS = 140

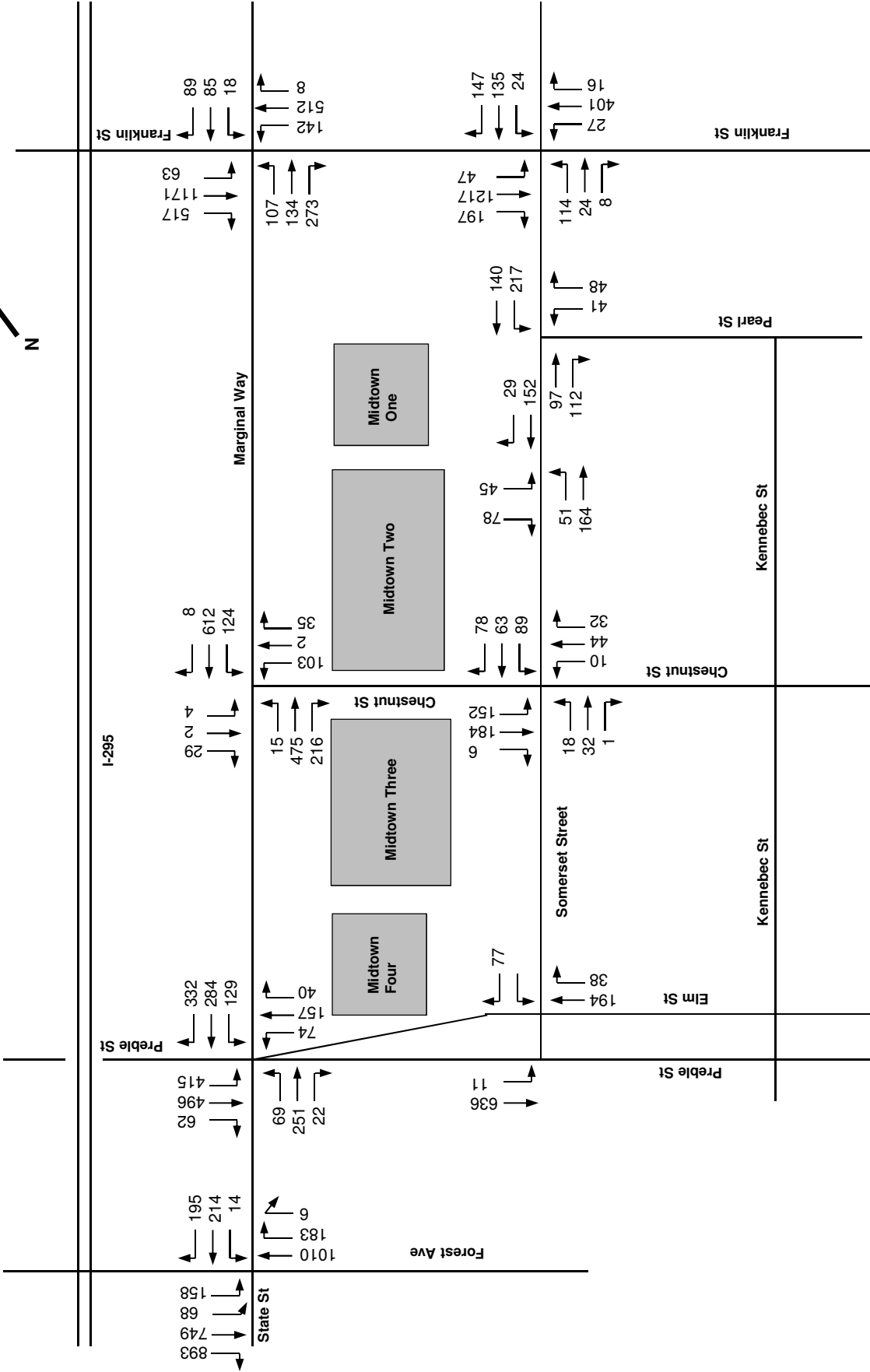
TOTAL EXITING TRIPS = 135



**Figure 3**  
Not to Scale



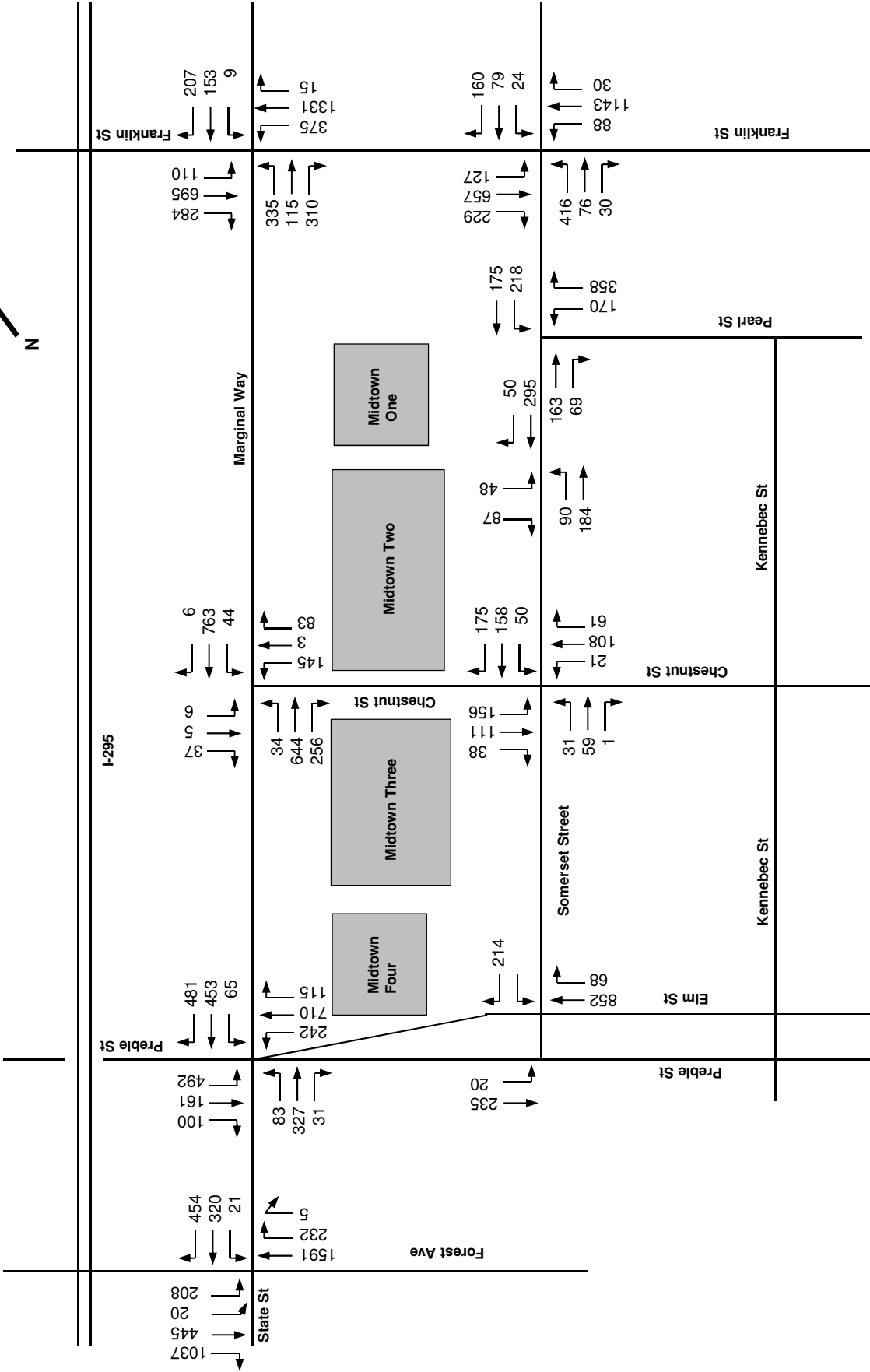
# Post-Development Turning Movement Counts AM Peak Hour



**Figure 4**  
Not to Scale



# Post-Development Turning Movement Counts PM Peak Hour



**Figure 5**  
Not to Scale





### 3.0 CAPACITY ANALYSIS

To assess quality of flow, capacity analyses were conducted for the study area intersections. The capacity analyses provide a standardized indication of the ability of the intersections to accommodate traffic demands placed upon them.

#### *Level of Service Criteria*

Capacity Analyses were conducted using Simtraffic simulation software for the signalized and unsignalized intersections. The Level of Service is conceptually defined as a quantitative measure describing operational conditions within a traffic stream and their perception by motorists.

A Level of Service definition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. In doing so, Level of Service provides an index to quality of traffic flow.

Six Levels of Service are defined for each type of facility. They are given letter designations, from A to F, with Level of Service (LOS) A representing the best operating conditions and LOS F representing the worst. Since the Level of Service of a traffic facility is a function of traffic flows placed upon it, an intersection may operate at a wide range of Levels of Service, depending on time of day, day of week, or period of year.

The average delay per vehicle approaching an intersection is used to quantify the Level of Service at a particular intersection. This is discussed briefly below, and LOS designations are defined in Table 3. Average delay measures the mean stopped delay experienced by vehicles entering an intersection during the design period. Average delay is measured for each individual turning movement that must yield the right of way, and for the intersection as a whole (including through vehicles that experience no delay).

**Table 3 – Intersection Level of Service Criteria**

Level of Service	Unsignalized Delay (sec/veh.)	Signalized Delay (sec/veh)
A	≤10	≤10
B	>10 to 15	>10 to 20
C	>15 to 25	>20 to 35
D	>25 to 35	>35 to 55
E	>35 to 50	>55 to 80
F	>50	>80

Source: *Highway Capacity Manual, 2010, TRB*

### **3.1 Operating Conditions**

The Synchro traffic analysis software package (Version 8) with Simtraffic was employed along to evaluate operating conditions at study area intersections. Capacity analyses worksheets for each intersection can be found in the Appendix. The simulations were run for a full hour. Five simulations were run for each scenario and averaged. Since simulations were utilized as opposed to formulaic calculations, the operations at one intersection can greatly impact the operations at an upstream or downstream location.

The results of the analysis at each intersection are documented in the following pages. The 2018 Pre-Development and 2018 Post Development (Previous Development) results have been copied from the previous study. The 2018 Post Development (Current proposal) results are shown in the rightmost columns for comparison.

The 2018 AM and PM peak hour post-development results are based on the following changes:

1. Proposed development driveways,
2. Updated signal timings and phasing,
3. An adjusted lane configuration at the intersection of Franklin Street & Marginal Way, and;
4. A proposed signal at the intersection of Chestnut Street & Marginal Way.

The lane group letter identifies direction of travel and lane configuration. “L” = Left, “R” = Right, “LT” = Left and Thru combined, “RT” = Right and Thru combined and “T” is a Thru only lane. Queue lengths are expressed in feet while Delay is shown as seconds per vehicle.

**Sim Traffic Results for Marginal Way, Preble Street & Elm Street**  
*Signalized*

Lane Group		2018 AM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Marginal Way	SE L	245	34.7	C	225	12.7	B	253	17.2	B
	SE LT	407	70.0	E	267	25.6	C	331	42.7	D
	SE TR	339	17.0	B	221	11.5	B	272	22.5	C
	NE L	98	45.0	D	92	26.0	C	98	24.3	C
	NE TR	306	43.8	D	240	24.8	C	239	25.9	C
Preble St/ Elm St	NW L	85	44.1	D	97	35.4	D	79	21.6	C
	NW T	97	19.8	B	99	27.5	C	84	18.9	B
	NW TR	100	16.7	B	107	20.7	C	91	13.2	B
	SW L	145	42.3	D	168	44.9	D	191	67.5	E
	SW T	222	29.2	C	306	33.0	C	208	28.6	C
	SW R	142	3.2	A	242	27.4	C	154	5.4	A
<b>Overall</b>			<b>32.4</b>	<b>C</b>		<b>25.0</b>	<b>C</b>		<b>26.4</b>	<b>C</b>

**Sim Traffic Results for Marginal Way, Preble Street & Elm Street**  
*Signalized*

Lane Group		2018 PM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Marginal Way	SE L	245	46.4	D	245	46.5	D	249	23.6	C
	SE LT	382	106.7	F	734	137.2	F	323	54.2	D
	SE TR	282	25.1	C	656	31.8	C	238	21.7	C
	NE L	98	49.0	D	103	44.9	D	97	40.6	D
	NE TR	251	29.3	C	302	36.7	D	250	26.2	C
Preble St/ Elm St	NW L	211	60.8	E	207	49.4	D	220	26.8	C
	NW T	289	42.8	D	287	30.3	C	282	32.9	C
	NW TR	280	41.7	D	269	28.8	C	269	33.0	C
	SW L	200	41.3	D	257	62.6	E	185	41.1	D
	SW T	557	52.3	D	707	77.3	E	436	40.2	D
	SW R	227	7.6	A	290	7.7	A	264	13.1	B
<b>Overall</b>			<b>42.8</b>	<b>D</b>		<b>47.2</b>	<b>D</b>		<b>31.2</b>	<b>C</b>

At the intersection of Marginal Way, Preble Street Elm Street, the intersection will operate similar to the previous proposal during the morning peak hour, but considerably better during the evening peak hour. The signal timing has been modified to accommodate the NW L movement since the development is expected to increase volumes.

**Sim Traffic Results for Somerset Street & Chestnut Street**  
*Stop Controlled*

Lane Group		2018 AM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Somerset St	NE LTR	52	5.1	A	73	5.4	A	58	5.4	A
	SW LTR	74	5.4	A	93	5.5	A	89	5.3	A
Chestnut St	NW LTR	51	4.7	A	54	5.2	A	53	4.9	A
	SE LTR	85	6.3	A	101	7.6	A	109	7.7	A
<b>Overall</b>			<b>5.8</b>	<b>A</b>		<b>6.3</b>	<b>A</b>		<b>6.4</b>	<b>A</b>

**Sim Traffic Results for Somerset Street & Chestnut Street**  
*Stop Controlled*

Lane Group		2018 PM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Somerset St	NE LTR	73	13.7	B	58	5.9	A	52	4.6	A
	SW LTR	421	53.3	F	106	7.3	A	93	6.4	A
Chestnut St	NW LTR	245	37.4	E	75	6.5	A	72	6.2	A
	SE LTR	77	6.0	A	103	7.7	A	97	7.3	A
<b>Overall</b>			<b>31.1</b>	<b>D</b>		<b>7.1</b>	<b>A</b>		<b>6.3</b>	<b>A</b>

The intersection of Somerset Street/ Chestnut Street operates similar to the previous development proposal. There is a significant improvement during the evening peak hour over Pre-development conditions due to the proposed signal at the Chestnut Street/Marginal Way intersection. Under the pre-development scenario queues extended from Marginal Way to the Somerset Street/Chestnut Street four-way stop controlled intersections and caused an excessive delay during the evening peak hour.

**Sim Traffic Results for Somerset Street & Elm Street**  
*Stop Controlled*

Lane Group		2018 AM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Somerset St	SW R	464	4.3	A						
	SW TR				51	3.8	A	56	4.9	A
	NE T				37	6.2	A	38	5.9	A
Elm St	NW L	0	0.2	A	4	0.2	A	4	0.2	A
	NW LR	526	0.3	A	3	0.2	A	4	0.2	A
<b>Overall</b>			<b>1.1</b>	<b>A</b>		<b>1.6</b>	<b>A</b>		<b>1.8</b>	<b>A</b>

**Sim Traffic Results for Somerset Street & Elm Street**  
*Stop Controlled*

Lane Group		2018 PM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Somerset St	SW R	143	20.2	C						
	SW TR				191	22.9	C	147	18.5	C
	NE T				49	14.6	B	85	19.2	C
Elm St	NW L	105	2.2	A	95	2.0	A	57	1.4	A
	NW LR	67	1.0	A	74	0.8	A	36	0.9	A
<b>Overall</b>			<b>4.8</b>	<b>A</b>		<b>6.5</b>	<b>A</b>		<b>5.6</b>	<b>A</b>

It was assumed that Somerset Street will be extended to Preble Street in the Post development scenario. In the predevelopment scenario Somerset Street ends at Elm Street. The intersection operates at LOS A under all scenarios.

### Sim Traffic Results for Marginal Way & Franklin Street

*Signalized*

Lane Group		2018 AM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Marginal Way	NB LT	233	35.9	D						
	NB L				124	34.2	C	112	36.9	D
	NB R	189	20.3	C						
	NB TR				414	46.9	D	411	43.7	D
	SB LT	153	47.1	D	151	51.7	D	163	54.4	D
	SB R	63	5.9	A	74	6.8	A	77	7.2	A
Franklin Street	EB L	145	41.4	D	151	33.8	C	123	32.0	C
	EB T	222	17.2	B	222	15.4	B	223	21.4	C
	EB T	212	15.8	B	223	14.6	B	201	21.1	C
	EB R	212	10.5	B	203	9.0	A	207	12.6	B
	WB L	202	53.4	D	168	49.5	D	208	63.5	E
	WB T	236	19.2	B	223	18.4	B	182	19.1	B
	WB TR	159	15.6	B	147	15.6	B	194	17.0	B
<b>Overall</b>			<b>20.5</b>	<b>C</b>		<b>22.3</b>	<b>C</b>		<b>25.7</b>	<b>C</b>

### Sim Traffic Results for Marginal Way & Franklin Street

*Signalized*

Lane Group		2018 PM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Marginal Way	NB LT	949	162.3	F						
	NB L				339	44.7	D	398	61.5	E
	NB R	568	16.7	B						
	NB TR				298	27.7	C	323	29.0	C
	SB LT	181	41.3	D	244	66.7	E	216	54.3	D
	SB R	149	20.7	C	192	27.0	C	187	30.1	C
Franklin Street	EB L	170	69.4	E	168	81.1	F	160	69.5	E
	EB T	223	48.2	D	222	47.0	D	234	58.4	E
	EB T	209	10.3	D	210	37.4	D	207	47.4	D
	EB R	146	16.9	B	139	16.5	B	212	20.6	C
	WB L	445	90.6	F	430	62.7	E	377	58.7	E
	WB T	536	34.9	C	511	21.0	C	427	27.2	C
	WB TR	455	31.9	C	506	36.5	D	428	33.3	C
<b>Overall</b>			<b>53.8</b>	<b>D</b>		<b>39.5</b>	<b>D</b>		<b>40.9</b>	<b>D</b>

The current proposal will operate with similar conditions as the previous proposal at the intersection of Marginal Way and Franklin Street. The signal timings at the Franklin Street intersections were optimized to mitigate the changed traffic patterns. It is assumed that these signal operations will be more thoroughly examined by an ongoing study to improve the Franklin Street facility by the City of Portland.



### Sim Traffic Results for Franklin Street, Somerset Street & Fox

Signalized

Lane Group		2018 AM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Franklin Street	EB L	140	37.5	D	205	36.0	D	183	39.3	D
	EB T	368	13.1	B	453	18.5	B	437	15.3	B
	EB TR	391	15.9	B	470	21.7	C	452	18.4	B
	WB L	55	44.3	D	68	42.9	D	80	52.5	D
	WB T	203	23.2	C	221	26.0	C	233	28.9	C
	WB TR	136	22.4	C	161	21.6	C	169	24.6	C
Somerset Street	NB L	91	41.5	D	124	39.0	D	97	32.2	C
	NB L	54	36.3	D	85	37.2	D	111	47.4	D
	NB TR	70	26.7	C	71	24.4	C	67	25.2	C
Fox Street	SB LT	168	39.3	D	189	39.4	D	182	45.2	D
	SB R	99	6.5	A	117	6.4	A	104	6.9	A
<b>Overall</b>			<b>19.0</b>	<b>B</b>		<b>23.1</b>	<b>C</b>		<b>22.2</b>	<b>C</b>

### Sim Traffic Results for Franklin Street, Somerset Street & Fox

Signalized

Lane Group		2018 PM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Franklin Street	EB L	226	58.5	E	150	52.5	D	186	62.7	E
	EB T	202	12.6	B	285	23.5	C	239	23.9	C
	EB TR	209	15.6	B	329	24.1	C	260	24.8	C
	WB L	251	62.3	E	248	62.0	E	225	47.3	D
	WB T	591	45.7	D	672	55.1	E	452	36.3	D
	WB TR	548	32.6	C	619	46.5	D	399	27.7	C
Somerset Street	NB L	354	130.8	F	322	96.1	F	198	39.3	D
	NB L	384	102.2	F	352	98.7	F	221	54.4	D
	NB TR	513	76.1	E	386	57.5	E	119	30.4	C
Fox Street	SB LT	219	60.1	E	165	49.6	D	144	43.4	D
	SB R	170	34.4	C	136	22.3	C	128	20.2	C
<b>Overall</b>			<b>45.4</b>	<b>D</b>		<b>48.5</b>	<b>D</b>		<b>33.5</b>	<b>C</b>

The current proposal will operate with similar conditions as the pre development condition and the previous proposal at the intersection of Marginal Way and Franklin Street during the weekday morning peak hour, and operate better during the evening peak hour.

**Sim Traffic Results for East Entrance & Somerset Street**

*Stop Controlled*

Lane Group		2018 AM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Somerset St	NE LT				12	0.9	A	52	2.1	A
	SW TR				11	1.5	A	12	0.7	A
Driveway	SE L				43	2.9	A	40	4.4	A
	SE R				35	2.0	A	53	1.3	A
<b>Overall</b>						<b>1.5</b>	<b>A</b>		<b>1.6</b>	<b>A</b>

**Sim Traffic Results for East Entrance & Somerset Street**

*Stop Controlled*

Lane Group		2018 PM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Somerset St	NE LT				20	0.9	A	92	3.9	A
	SW TR				24	1.6	A	25	1.0	A
Driveway	SE L				38	4.3	A	45	6.7	A
	SE R				35	2.9	A	53	1.6	A
<b>Overall</b>						<b>1.7</b>	<b>A</b>		<b>2.4</b>	<b>A</b>

The proposed driveway intersection with Somerset Street is expected to function at LOS A during both the morning and evening peak hours.

**Sim Traffic Results for Marginal Way, State, Forest Avenue & Kennebec Street**  
*Signalized*

Lane Group		2018 AM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Marginal Way	WB LT	165	54.7	D	160	53.8	D	146	50.3	D
	WB T	168	76.8	E	176	78.3	E	146	69.2	E
	WB R	160	9.9	A	171	9.4	A	38	2.4	A
Forest Ave	NB T	51	2.7	A	33	2.3	A	74	4.0	A
	NB TR	118	8.7	A	97	6.3	A	88	5.1	A
	SB L	201	59.2	E	235	59.7	E	271	68.5	E
	SB LT	294	58.2	E	284	55.4	E	295	54.3	D
	SB T	272	26.3	C	262	20.9	C	268	23.5	C
	SB R	97	2.7	A	102	2.7	A	201	3.0	A
<b>Overall</b>			<b>19.4</b>	<b>B</b>		<b>18.5</b>	<b>B</b>		<b>17.7</b>	<b>B</b>

**Sim Traffic Results for Marginal Way, State, Forest Avenue & Kennebec Street**  
*Signalized*

Lane Group		2018 PM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Marginal Way	WB LT	228	61.1	E	220	59.1	E	220	61.4	E
	WB T	905	214.4	F	870	201.0	F	282	95.8	F
	WB R	327	39.0	D	312	38.6	D	243	7.1	A
Forest Ave	NB T	119	5.5	A	104	5.3	A	137	7.3	A
	NB TR	148	12.7	B	143	12.5	B	166	10.8	B
	SB L	358	160.4	F	361	150.8	F	358	231.1	F
	SB LT	200	41.4	D	194	38.6	D	357	194.1	F
	SB T	207	27.3	C	191	26.1	C	329	71.3	E
	SB R	170	3.2	A	158	3.1	A	377	7.1	A
<b>Overall</b>			<b>32.5</b>	<b>C</b>		<b>31.5</b>	<b>C</b>		<b>34.7</b>	<b>C</b>

The intersection of Marginal Way, State Forest Avenue and Kennebec Street will operate at an overall LOS of B during the morning peak hour and LOS C during the evening peak hour. This is the same level of service as pre development conditions.

**Sim Traffic Results for Somerset Street & Pearl Street**  
*Stop Controlled*

Lane Group		2018 AM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Pearl Street	NW LR	56	6.6	A	59	6.9	A	64	7.0	A
Somerset St	NE TR	17	1.2	A	18	0.6	A	15	0.6	A
	SW LT	96	3.7	A	99	3.7	A	95	3.5	A
<b>Overall</b>			<b>3.4</b>	<b>A</b>		<b>3.1</b>	<b>A</b>		<b>3.1</b>	<b>A</b>

**Sim Traffic Results for Somerset Street & Pearl Street**  
*Stop Controlled*

Lane Group		2018 PM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Pearl Street	NW LR	643	82.5	F	586	69.8	F	467	39.6	D
Somerset St	NE TR	87	5.2	A	51	2.3	A	14	0.9	A
	SW LT	149	6.4	A	100	3.8	A	89	3.3	A
<b>Overall</b>			<b>42.8</b>	<b>E</b>		<b>32.9</b>	<b>D</b>		<b>19.3</b>	<b>B</b>

During the morning peak hour, the intersection will operate at LOS A. During the evening peak hour, the Pearl Street approach will operate at LOS F under the pre-development scenario and LOS D with the current proposal. This improvement at Pearl Street is due to the proposed signal at the Chestnut Street/Marginal Way intersection. In the pre-development conditions queues extended from Marginal Way to Somerset Street and over to the intersection with Pearl Street causing excessive delay.

### Sim Traffic Results for Marginal Way, Chestnut Street & Park and Ride

*Stop Controlled – Pre, Signalized Post*

Lane Group		2018 AM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Marginal Way	NE LT	45	3.3	A	119	13.3	B	142	12.9	B
	NE TR	31	3.8	A	191	12.4	B	205	12.8	B
	SW L	80	8.6	A	187	48.2	D	170	37.8	D
	SW TR	3	3.1	A	374	20.1	C	280	15.1	B
Chestnut St	NW LTR	110	33.7	D	86	10.3	B	98	13.4	B
Park and Ride	SE L	14	10.1	B	13	6.5	A	16	15.0	B
	SE TR	45	9.6	A	39	7.4	A	40	7.0	A
<b>Overall</b>			<b>5.7</b>	<b>A</b>		<b>17.9</b>	<b>B</b>		<b>15.5</b>	<b>B</b>

### Sim Traffic Results for Marginal Way, Chestnut Street & Park and Ride

*Stop Controlled – Pre, Signalized Post*

Lane Group		2018 PM Peak Hour								
		Predevelopment			Post Development (Previous Development Plan)			Post Development (Current Development Plan)		
		Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS
Marginal Way	NE LT	105	4.9	A	235	24.9	C	196	20.5	C
	NE TR	59	3.6	A	277	13.9	B	238	12.8	B
	SW L	54	6.7	A	173	45.1	D	104	25.5	C
	SW TR	70	3.8	A	735	33.8	C	359	16.9	B
Chestnut St	NW LTR	583	146.9	F	177	15.8	B	141	13.8	B
Park and Ride	SE L	29	32.9	D	18	17.0	B	28	21.2	C
	SE TR	72	33.3	D	50	14.0	B	53	12.9	B
<b>Overall</b>			<b>23.5</b>	<b>C</b>		<b>24.0</b>	<b>C</b>		<b>16.0</b>	<b>B</b>

In the pre-development scenarios Marginal Way is free flowing while drivers on Chestnut Street is required to stop. Chestnut Street currently experiences significant delays during the evening peak hour. Adding a new traffic signal will improve the operations on Chestnut Street. With the change in development size, this intersection will operate better than previously analyzed.

## **4.0 CONCLUSION**

FST has completed a supplement to the original Traffic Impact Study for the proposed midtown development located at 105 Somerset Street in Portland. This supplement highlights the change in impacts due to the change in the development. The following results have been identified in the original traffic study and this supplement;

1. The current proposal is smaller than originally proposed and consists of 440 residential apartment units along with 87,200 sf of retail development. Since the size of the development will be DECREASING, the amount of traffic to be generated by the project will decrease from the original study.
2. The proposed development is forecasted to generate 203 and 276 trip ends during the AM and PM peak hours respectively.
3. The current proposal will generate 101 fewer trips (26 in/75 out) during the morning peak hour and 103 fewer trips (61 in/43 out) during the weekday evening peak hour than was originally studied.
4. The proposed development will include a Traffic Demand Management Plan to assist in reducing site-generated traffic impacts.
5. There will be one access drive to the proposed garage, which will be located on Somerset Street.
6. Optimization of signal timings will reduce the impacts of the site generated traffic at most of the study intersections.
7. A new traffic signal is proposed at the intersection of Marginal Way/Chestnut Street & the park and ride lot. This signal has been considered previously by the City of Portland and is desirable with or without the midtown development project.

With the implementation of the proposed mitigation, the traffic impacts of the midtown development will operate similar to the pre-development conditions.





# Appendix



## Trip Generation Calculations

The current proposed development consists of

Total 87,200 sf retail space  
 Total 440 apartments.

The trip Generation was calculated using the following methodology. First the Trip Generation for each use was calculated.

Table A – Trip Generation – Current Development – For Individual Land Uses			
	Entering	Exiting	Total
AM – Retail	55	35	90
<u>AM – Residential</u>	<u>33</u>	<u>99</u>	<u>132</u>
<b>AM - Total</b>	<b>88</b>	<b>134</b>	<b>222</b>
PM – Retail	102	129	231
<u>PM – Residential</u>	<u>93</u>	<u>60</u>	<u>153</u>
<b>PM - Total</b>	<b>195</b>	<b>189</b>	<b>384</b>

Then the “shared trips” between the retail and residential uses were accounted for.

Table B – Trip Generation – Current Development – Shared Trip Credit			
	Entering	Exiting	Total
AM – Total	88	134	222
<b>AM – External</b>	<b>86</b>	<b>132</b>	<b>218</b>
PM – Total	195	189	384
<b>PM – External</b>	<b>151</b>	<b>145</b>	<b>296</b>

Lastly, a TDM credit was applied to the trip generation.

Table C – Trip Generation – Current Development – TDM Credit			
	Entering	Exiting	Total
AM – Unadjusted	86	132	218
<u>AM- TDM (7%)</u>	<u>6</u>	<u>9</u>	<u>15</u>
<b>AM – Net Trips</b>	<b>80</b>	<b>123</b>	<b>203</b>
PM – Unadjusted	151	145	296
<u>PM- TDM (7%)</u>	<u>11</u>	<u>10</u>	<u>21</u>
<b>PM – Net Trips</b>	<b>140</b>	<b>135</b>	<b>275</b>

Table 1 – Trip Generation – Current Development			
	Entering	Exiting	Total
<b>AM</b>	<b>80</b>	<b>123</b>	<b>203</b>
<b>PM</b>	<b>140</b>	<b>135</b>	<b>276</b>

Date: \_\_\_\_\_

# Multi-Use Trip Generation Calculation

Time Period AM Peak Hour  
Job # \_\_\_\_\_

LAND USE A RETAIL		
ITE Land Use Size	814	sf
Total	55	1
Enter	35	1
Exit	90	2
%	100%	2%
External	54	
Internal	34	
Total	88	98%

Enter From External 34

Exit to External 54

Demand 0

Balanced 0

Demand 0

14% 5

Balanced 1

2% 1

17% 9 Demand

Balanced 1

1% 1 Demand

LAND USE B OFFICE		
ITE Land Use Size		sf
Total	0	0
Enter	0	0
Exit	0	0
%	100%	#DIV/0!
External	0	
Internal	0	
Total	0	0

Exit to External 0

Enter From External 0

LAND USE C RESIDENTIAL		
ITE Land Use Size	232	440 units
Total	33	1
Enter	99	1
Exit	132	2
%	100%	1%
External	32	
Internal	98	
Total	130	99%

Enter From External 32

Exit to External 98

Net External Trips for Multi Use Development				
	Land Use A	Land Use B	Land Use C	Total
Enter	54	0	32	86
Exit	34	0	98	132
Total	88	0	130	219
Single Use Trip Gen Estimate	90	0	132	222
INTERNAL CAPTURE				1%

Date: \_\_\_\_\_

## Multi-Use Trip Generation Calculation

Time Period PM Peak Hour  
Job # \_\_\_\_\_

### LAND USE A RETAIL

ITE Land Use Size		814	
Total		87,200 sf	
Enter	Internal	10	External
Exit	Internal	34	External
Total	Internal	44	External
%	Internal	19%	External
Total		231	187
%		100%	81%

Enter From External  
95

Exit to External  
92

Demand 0

Balanced 0

Demand 0

Demand 34

Balanced 34

Demand 43

### LAND USE B

ITE Land Use Size		sf	
Total		0	
Enter	Internal	0	External
Exit	Internal	0	External
Total	Internal	0	External
%	Internal	100%	#DIV/0!

Exit to External  
0

Enter From External  
0

Demand 0

Balanced 0

Demand 2

Demand 0

Balanced 0

Demand 0

### LAND USE C RESIDENTIAL

ITE Land Use Size		232 units	
Total		440 units	
Enter	Internal	34	External
Exit	Internal	10	External
Total	Internal	44	External
%	Internal	29%	71%

Enter From External  
59

Exit to External  
50

Demand 10

Balanced 10

Demand 25

Net External Trips for Multi-Use Development			
	Land Use A	Land Use B	Land Use C
Enter	92	0	59
Exit	95	0	50
Total	187	0	109
Single Use Trip Gen Estimate	231	0	153
			384

### INTERNAL CAPTURE

23%

## Synchro/SimTraffic Results



SimTraffic Simulation Summary  
 2018 AM Post Development Design Hour Volumes

11/14/2014

Summary of All Intervals

Run Number	1	2	3	4	Current Proposal	Avg
Start Time	7:50	7:50	7:50	7:50	7:50	7:50
End Time	9:00	9:00	9:00	9:00	9:00	9:00
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded mScheduledIntervals	1	1	1	1	1	1
Vehs Entered	9315	9371	9136	9304	9272	9268
Vehs Exited	9188	9326	9088	9228	9268	9207
Starting Vehs	363	360	408	369	393	361
Ending Vehs	490	405	456	445	397	431
Denied Entry Before	1	0	2	1	5	0
Travel Distance (mi)	4793	4783	4723	4789	4791	4772
Travel Time (hr)	522.5	363.6	467.7	388.5	443.3	444.0
Total Delay (hr)	355.8	197.7	303.2	221.9	276.3	278.1
Total Stops	16666	15065	15915	15584	15858	15768
Fuel Used (gal)	254.4	219.2	240.9	225.5	237.1	236.8

Interval #0 Information Seeding

Start Time	7:50
End Time	8:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	8:00
End Time	9:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	Current Proposal	Avg
Vehs Entered	9315	9371	9136	9304	9272	9268
Vehs Exited	9188	9326	9088	9228	9268	9207
Starting Vehs	363	360	408	369	393	361
Ending Vehs	490	405	456	445	397	431
Denied Entry Before	1	0	2	1	5	0
Travel Distance (mi)	4793	4783	4723	4789	4791	4772
Travel Time (hr)	522.5	363.6	467.7	388.5	443.3	444.0
Total Delay (hr)	355.8	197.7	303.2	221.9	276.3	278.1
Total Stops	16666	15065	15915	15584	15858	15768
Fuel Used (gal)	254.4	219.2	240.9	225.5	237.1	236.8

1: Performance by lane

Lane	EB	EB	WB	All
Movements Served	T	T	R	
Denied Del/Veh (s)				0.0
Total Del/Veh (s)	2.2	2.3	3.0	2.5

6: Marginal Way Performance by lane

Lane	SE	SE	SE	NW	NW	NW	NE	NE	SW	SW	SW	All
Movements Served	L	LT	TR	L	T	TR	L	TR	L	T	R	
Denied Del/Veh (s)												0.2
Total Del/Veh (s)	17.2	42.7	22.5	21.6	18.9	13.2	24.3	25.9	67.5	28.6	5.4	26.4

7: Somerset St & Chestnut St Performance by lane

Lane	SE	NW	NE	SW	All
Movements Served	LTR	LTR	LTR	LTR	
Denied Del/Veh (s)					0.0
Total Del/Veh (s)	7.7	4.9	5.4	5.3	6.4

10: NB off-ramp/NB on-ramp Performance by lane

Lane	EB	EB	EB	WB	WB	NB	NB	All
Movements Served	T	T	T	T	R	R	R	
Denied Del/Veh (s)								0.0
Total Del/Veh (s)	43.6	61.9	42.1	2.1	2.1	31.5	27.8	30.7

11: Performance by lane

Lane	WB	SE	SE	SE	NW	NW	All
Movements Served	R	T	T	T	T	T	
Denied Del/Veh (s)							0.1
Total Del/Veh (s)	17.1	0.3	0.9	1.7	0.9	3.5	3.7

13: Somerset St & Elm St Performance by lane

Lane	NW	NW	NE	SW	All
Movements Served	L	LR	T	TR	
Denied Del/Veh (s)					0.1
Total Del/Veh (s)	0.2	0.2	5.9	4.9	1.8

14: Performance by lane

Lane	SE	SE	SE	NW	NW	NW	All
Movements Served	T	T	T	T	T	TR	
Denied Del/Veh (s)							0.0
Total Del/Veh (s)	0.2	0.5	1.0	6.6	6.3	5.5	3.4

15: Marginal Way & Franklin Street Performance by lane

Lane	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	All
Movements Served	L	T	T	R	L	T	TR	L	TR	LT	R	
Denied Del/Veh (s)												0.1
Total Del/Veh (s)	32.0	21.4	21.1	12.6	63.5	19.1	17.0	36.9	43.7	54.4	7.2	25.7

16: Performance by lane

Lane	EB	WB	SE	SE	NW	NW	NW	All
Movements Served	R	R	T	T	T	T	T	
Denied Del/Veh (s)								43.3
Total Del/Veh (s)	3.8	306.8	0.2	1.1	41.8	37.9	19.5	19.3

20: Somerset St/Fox St & Franklin Street Performance by lane

Lane	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	All
Movements Served	L	T	TR	L	T	TR	L	L	TR	LT	R	
Denied Del/Veh (s)												0.3
Total Del/Veh (s)	39.3	15.3	18.4	52.5	28.9	24.6	32.2	47.4	25.2	45.2	6.9	22.2

25: Preble St & Elm St Performance by lane

Lane	WB	WB	SE	SE	All
Movements Served	R	R	T	T	
Denied Del/Veh (s)					0.0
Total Del/Veh (s)	0.3	0.3	1.6	1.7	1.2

26: Somerset St & Driveway Performance by lane

Lane	SE	SE	NE	SW	All
Movements Served	L	R	LT	TR	
Denied Del/Veh (s)					0.0
Total Del/Veh (s)	4.4	1.3	2.1	0.7	1.6

27: Driveway Performance by lane

Lane	EB	NW	All
Movements Served	R	L	
Denied Del/Veh (s)			0.1
Total Del/Veh (s)	4.0	2.1	3.4

30: I-295 NB mainline & NB off-ramp Performance by lane

Lane	NB	NB	All
Movements Served	T	TR	
Denied Del/Veh (s)			1.8
Total Del/Veh (s)		1.3	1.4

36: Preble St & Somerset St Performance by lane

Lane	SE	SE	SW	All
Movements Served	LT	T	L	
Denied Del/Veh (s)				0.0
Total Del/Veh (s)	0.2	0.3	6.3	0.4

40: I-295 SB mainline Performance by lane

Lane	SB	SB	SB	All
Movements Served	T	R	R	
Denied Del/Veh (s)				0.0
Total Del/Veh (s)		1.8	1.4	1.7

92: Forest Avenue & High St Performance by lane

Lane	EB	EB	NB	NB	SB	SB	All
Movements Served	L	LR	T	T	T	T	
Denied Del/Veh (s)							4.8
Total Del/Veh (s)	58.4	102.6	48.9	21.7	2.3	1.7	45.5

93: Kennebec St & State St/Marginal Way Performance by lane

Lane	WB	WB	WB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	T	R	T	TR>	<	LT	T	R	
Denied Del/Veh (s)										0.0
Total Del/Veh (s)	50.3	69.2	2.4	4.0	5.1	68.5	54.3	23.5	3.0	17.7

94: Bedford St & Forest Avenue Performance by lane

Lane	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	All
Movements Served	LT	R	L	T	R	L	T	TR	T	TR	
Denied Del/Veh (s)											0.4
Total Del/Veh (s)	62.7	8.1	59.1	41.4	5.0	105.2	46.5	26.7	43.5	50.9	43.3

252: Performance by lane

Lane	EB	SE	SE	SE	NW	NW	All
Movements Served	R	T	T	T	T	T	
Denied Del/Veh (s)							0.0
Total Del/Veh (s)	111.6	1.8	3.1	2.2	0.8	4.4	12.6

902: Somerset St & Pearl St Performance by lane

Lane	NW	NE	SW	All
Movements Served	LR	TR	LT	
Denied Del/Veh (s)				0.0
Total Del/Veh (s)	7.0	0.6	3.5	3.1

905: Marginal Way & Chestnut St Performance by lane

Lane	SE	SE	NW	NE	NE	SW	SW	All
Movements Served	L	TR	LTR	LT	TR	L	TR	
Denied Del/Veh (s)								0.0
Total Del/Veh (s)	15.0	7.0	13.4	12.9	12.8	37.8	15.1	15.5

Total Network Performance

Denied Del/Veh (s)		18.1
Total Del/Veh (s)		86.3

Queuing and Blocking Report  
 2018 AM Post Development Design Hour Volumes

11/14/2014

Intersection: 1:

Movement	EB	EB	B85	B85
Directions Served	T	T	T	T
Maximum Queue (ft)	161	170	15	21
Average Queue (ft)	15	17	1	1
95th Queue (ft)	101	112	10	14
Link Distance (ft)	210	210	353	353
Upstream Blk Time (%)	1	1		
Queuing Penalty (veh)	9	9		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Marginal Way

Movement	SE	SE	SE	NW	NW	NW	NE	NE	SW	SW	SW
Directions Served	L	LT	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	209	372	315	94	108	109	84	262	221	256	224
Average Queue (ft)	168	236	179	38	47	52	49	137	100	121	81
95th Queue (ft)	253	331	272	79	84	91	98	239	191	208	154
Link Distance (ft)		844	844		225	225		876		640	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	185			150			60		300		200
Storage Blk Time (%)	0	17			0		4	28	0	1	0
Queuing Penalty (veh)	2	36			0		12	19	0	4	0

Intersection: 7: Somerset St & Chestnut St

Movement	SE	NW	NE	SW
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	136	55	74	111
Average Queue (ft)	68	33	30	53
95th Queue (ft)	109	53	58	89
Link Distance (ft)	497	403	464	303
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
 2018 AM Post Development Design Hour Volumes

11/14/2014

Intersection: 10: NB off-ramp/NB on-ramp

Movement	EB	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	R	R	R
Maximum Queue (ft)	385	373	369	126	65	276	255
Average Queue (ft)	244	248	229	7	2	151	131
95th Queue (ft)	377	372	352	54	36	229	208
Link Distance (ft)	322	322	322	137	137	866	866
Upstream Blk Time (%)	7	5	5	0	0		
Queuing Penalty (veh)	31	22	19	0	0		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 11:

Movement	WB	SE	SE	SE	NW	NW
Directions Served	R	T	T	T	T	T
Maximum Queue (ft)	320	32	112	188	79	164
Average Queue (ft)	133	1	8	17	7	49
95th Queue (ft)	286	22	71	134	50	144
Link Distance (ft)	416	249	249	249	148	148
Upstream Blk Time (%)	1		0	1	0	2
Queuing Penalty (veh)	0		0	5	1	10
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 13: Somerset St & Elm St

Movement	NW	NW	NE	SW
Directions Served	L	LR	T	TR
Maximum Queue (ft)	5	5	38	69
Average Queue (ft)	0	0	13	33
95th Queue (ft)	4	4	38	56
Link Distance (ft)	528	528	156	464
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
 2018 AM Post Development Design Hour Volumes

11/14/2014

Intersection: 14:

Movement	SE	SE	NW	NW	NW
Directions Served	T	T	T	T	TR
Maximum Queue (ft)	14	50	94	117	140
Average Queue (ft)	0	4	28	33	42
95th Queue (ft)	7	28	133	146	175
Link Distance (ft)	133	133	249	249	249
Upstream Blk Time (%)			0	0	1
Queuing Penalty (veh)			1	2	7
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 15: Marginal Way & Franklin Street

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	136	223	206	210	230	236	235	140	495	199	106
Average Queue (ft)	55	190	185	179	117	93	108	62	237	85	38
95th Queue (ft)	123	223	201	207	208	182	194	112	411	163	77
Link Distance (ft)		137	137	137		426	426	992	992	481	
Upstream Blk Time (%)	0	29	40	22							
Queuing Penalty (veh)	0	168	235	132							
Storage Bay Dist (ft)	50				350						150
Storage Blk Time (%)	12	42								3	
Queuing Penalty (veh)	73	26								2	

Intersection: 16:

Movement	EB	WB	SE	SE	B22	B22	NW	NW	NW
Directions Served	R	R	T	T	T	T	T	T	T
Maximum Queue (ft)	214	221	36	158	32	61	254	260	234
Average Queue (ft)	62	156	1	24	1	2	129	141	123
95th Queue (ft)	155	270	19	85	20	34	313	324	288
Link Distance (ft)	325	200	145	145	119	119	133	133	133
Upstream Blk Time (%)	0	63		0	0	0	32	33	24
Queuing Penalty (veh)	0	0		2	0	0	125	128	94
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									



Queuing and Blocking Report  
 2018 AM Post Development Design Hour Volumes

11/14/2014

Intersection: 20: Somerset St/Fox St & Franklin Street

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	L	TR	LT	R
Maximum Queue (ft)	323	459	452	163	272	232	119	122	88	233	143
Average Queue (ft)	53	209	233	22	121	68	42	68	29	102	53
95th Queue (ft)	183	437	452	80	233	169	97	111	67	182	104
Link Distance (ft)		426	426		655	655			464	695	
Upstream Blk Time (%)		1	2								
Queuing Penalty (veh)		5	11								
Storage Bay Dist (ft)	175			150			275	275			100
Storage Blk Time (%)		7			8					15	0
Queuing Penalty (veh)		3			2					22	0

Intersection: 25: Preble St & Elm St

Movement	WB
Directions Served	R
Maximum Queue (ft)	9
Average Queue (ft)	0
95th Queue (ft)	7
Link Distance (ft)	257
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 26: Somerset St & Driveway

Movement	SE	SE	NE	SW
Directions Served	L	R	LT	TR
Maximum Queue (ft)	31	67	80	28
Average Queue (ft)	21	30	15	1
95th Queue (ft)	40	53	52	12
Link Distance (ft)	5	5	303	129
Upstream Blk Time (%)	5	4		
Queuing Penalty (veh)	5	4		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
 2018 AM Post Development Design Hour Volumes

11/14/2014

Intersection: 27: Driveway

Movement	EB	NW
Directions Served	R	L
Maximum Queue (ft)	84	42
Average Queue (ft)	46	28
95th Queue (ft)	73	45
Link Distance (ft)	192	5
Upstream Blk Time (%)		2
Queuing Penalty (veh)		2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 30: I-295 NB mainline & NB off-ramp

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 36: Preble St & Somerset St

Movement	SW
Directions Served	L
Maximum Queue (ft)	31
Average Queue (ft)	9
95th Queue (ft)	31
Link Distance (ft)	156
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report  
 2018 AM Post Development Design Hour Volumes

11/14/2014

Intersection: 40: I-295 SB mainline

Movement

Directions Served  
 Maximum Queue (ft)  
 Average Queue (ft)  
 95th Queue (ft)  
 Link Distance (ft)  
 Upstream Blk Time (%)  
 Queuing Penalty (veh)  
 Storage Bay Dist (ft)  
 Storage Blk Time (%)  
 Queuing Penalty (veh)

Intersection: 92: Forest Avenue & High St

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	T	T	T	T
Maximum Queue (ft)	464	478	350	175	39	24
Average Queue (ft)	388	449	203	141	5	2
95th Queue (ft)	517	504	290	220	24	13
Link Distance (ft)	441	441	513		123	123
Upstream Blk Time (%)	7	44				
Queuing Penalty (veh)	0	0				
Storage Bay Dist (ft)				150		
Storage Blk Time (%)			22	2		
Queuing Penalty (veh)			43	3		

Intersection: 93: Kennebec St & State St/Marginal Way

Movement	WB	WB	WB	NB	NB	SB	SB	SB	SB
Directions Served	LT	T	R	T	TR>	<	LT	T	R
Maximum Queue (ft)	160	169	75	117	136	295	302	274	275
Average Queue (ft)	94	93	6	21	27	150	202	197	54
95th Queue (ft)	146	146	38	74	88	271	295	268	201
Link Distance (ft)		876		123	123	191	191	191	191
Upstream Blk Time (%)				0	0	9	15	14	1
Queuing Penalty (veh)				1	2	44	68	64	3
Storage Bay Dist (ft)	200		125						
Storage Blk Time (%)	0	3							
Queuing Penalty (veh)	0	10							

Queuing and Blocking Report  
 2018 AM Post Development Design Hour Volumes

11/14/2014

Intersection: 94: Bedford St & Forest Avenue

Movement	EB	EB	WB	WB	WB	B258	NB	NB	NB	B22	B22	B22
Directions Served	LT	R	L	T	R	T	L	T	TR	T	T	T
Maximum Queue (ft)	365	446	215	292	88	84	232	230	219	243	255	241
Average Queue (ft)	210	97	171	134	9	6	196	196	193	197	206	207
95th Queue (ft)	343	290	237	306	43	41	213	213	213	277	275	275
Link Distance (ft)		948		220		292	119	119	119	145	145	145
Upstream Blk Time (%)		0	3	5			87	87	54	72	70	54
Queuing Penalty (veh)		0	0	0			388	387	244	320	311	243
Storage Bay Dist (ft)	330		140		75							
Storage Blk Time (%)	2	0	31	2								
Queuing Penalty (veh)	11	0	41	8								

Intersection: 94: Bedford St & Forest Avenue

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	358	428
Average Queue (ft)	244	275
95th Queue (ft)	343	392
Link Distance (ft)	760	760
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 252:

Movement	EB	B9	SE	SE	SE	NW	NW
Directions Served	R	T	T	T	T	T	T
Maximum Queue (ft)	459	348	55	123	161	49	140
Average Queue (ft)	274	73	6	14	23	3	18
95th Queue (ft)	510	320	50	91	119	37	100
Link Distance (ft)	378	411	148	148	148	191	191
Upstream Blk Time (%)	25	12	0	2	3		1
Queuing Penalty (veh)	0	0	3	10	14		4
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report  
 2018 AM Post Development Design Hour Volumes

11/14/2014

Intersection: 902: Somerset St & Pearl St

Movement	NW	NE	SW
Directions Served	LR	TR	LT
Maximum Queue (ft)	76	27	127
Average Queue (ft)	39	2	43
95th Queue (ft)	64	15	95
Link Distance (ft)	522	129	464
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 905: Marginal Way & Chestnut St

Movement	SE	SE	NW	NE	NE	SW	SW
Directions Served	L	TR	LTR	LT	TR	L	TR
Maximum Queue (ft)	30	56	112	168	220	174	338
Average Queue (ft)	2	13	54	75	116	86	161
95th Queue (ft)	16	40	98	142	205	170	280
Link Distance (ft)		179	497	640	640		992
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	25					150	
Storage Blk Time (%)	1	5				2	6
Queuing Penalty (veh)	0	0				15	7

Network Summary

Network wide Queuing Penalty: 3475
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Summary of All Intervals

Run Number	1	2	3	4	Current Proposal	Avg
Start Time	4:50	4:50	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded mScheduledIntervals	1	1	1	1	1	1
Vehs Entered	10872	10740	10723	11030	10763	10884
Vehs Exited	10658	10476	10503	10736	10548	10661
Starting Vehs	471	417	434	450	474	442
Ending Vehs	685	681	654	744	689	672
Denied Entry Before	15	3	34	6	2	10
Travel Distance (mi)	5137	5100	5074	5247	5161	5173
Travel Time (hr)	841.1	771.7	726.0	739.8	754.6	735.7
Total Delay (hr)	653.4	585.6	541.0	548.7	566.1	547.1
Total Stops	21920	22686	20807	22308	22292	21969
Fuel Used (gal)	343.2	326.9	315.6	324.3	325.2	320.8

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	Current Proposal	Avg
Vehs Entered	10872	10740	10723	11030	10763	10884
Vehs Exited	10658	10476	10503	10736	10548	10661
Starting Vehs	471	417	434	450	474	442
Ending Vehs	685	681	654	744	689	672
Denied Entry Before	15	3	34	6	2	10
Travel Distance (mi)	5137	5100	5074	5247	5161	5173
Travel Time (hr)	841.1	771.7	726.0	739.8	754.6	735.7
Total Delay (hr)	653.4	585.6	541.0	548.7	566.1	547.1
Total Stops	21920	22686	20807	22308	22292	21969
Fuel Used (gal)	343.2	326.9	315.6	324.3	325.2	320.8

1: Performance by lane

Lane	EB	EB	WB	All
Movements Served	T	T	R	
Denied Del/Veh (s)				0.2
Total Del/Veh (s)	24.7	32.9	4.4	12.8

6: Marginal Way Performance by lane

Lane	SE	SE	SE	NW	NW	NW	NE	NE	SW	SW	SW	All
Movements Served	L	LT	TR	L	T	TR	L	TR	L	T	R	
Denied Del/Veh (s)												0.3
Total Del/Veh (s)	23.6	54.2	21.7	26.8	32.9	33.0	40.6	26.2	41.1	40.2	13.1	31.2

7: Somerset/Somerset St & Chestnut St Performance by lane

Lane	SE	NW	NE	SW	All
Movements Served	LTR	LTR	LTR	LTR	
Denied Del/Veh (s)					0.0
Total Del/Veh (s)	7.3	6.2	4.6	6.4	6.3

10: NB off-ramp/NB on-ramp Performance by lane

Lane	EB	EB	EB	WB	WB	NB	NB	All
Movements Served	T	T	T	T	R	R	R	
Denied Del/Veh (s)								0.0
Total Del/Veh (s)	175.3	178.7	138.6	4.0	3.4	28.4	20.6	33.5

11: Performance by lane

Lane	WB	SE	SE	SE	NW	NW	All
Movements Served	R	T	T	T	T	T	
Denied Del/Veh (s)							30.7
Total Del/Veh (s)	158.6	77.9	53.7	39.1	0.7	1.5	33.4

13: Somerset & Elm St & Elm Performance by lane

Lane	NW	NW	NE	SW	All
Movements Served	L	LR	T	TR	
Denied Del/Veh (s)					0.2
Total Del/Veh (s)	1.4	0.9	19.2	18.5	5.6

14: Performance by lane

Lane	SE	SE	SE	NW	NW	NW	All
Movements Served	T	T	T	T	T	TR	
Denied Del/Veh (s)							9.2
Total Del/Veh (s)	4.5	4.4	17.3	1.6	1.9	3.7	5.9

15: Marginal Way & Franklin Street Performance by lane

Lane	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	All
Movements Served	L	T	T	R	L	T	TR	L	TR	LT	R	
Denied Del/Veh (s)												0.2
Total Del/Veh (s)	69.5	58.4	47.4	20.6	58.7	27.2	33.3	61.5	29.0	54.3	30.1	40.9

16: Performance by lane

Lane	EB	WB	SE	SE	NW	NW	NW	All
Movements Served	R	R	T	T	T	T	T	
Denied Del/Veh (s)								47.6
Total Del/Veh (s)	76.2	54.2	0.7	15.3	5.3	5.1	5.6	15.2

20: Somerset St/Fox St & Franklin Street Performance by lane

Lane	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	All
Movements Served	L	T	TR	L	T	TR	L	L	TR	LT	R	
Denied Del/Veh (s)												0.4
Total Del/Veh (s)	62.7	23.9	24.8	47.3	36.3	27.7	39.3	54.4	30.4	43.4	20.2	33.5

25: Preble St & Elm Performance by lane

Lane	WB	WB	SE	SE	All
Movements Served	R	R	T	T	
Denied Del/Veh (s)					0.0
Total Del/Veh (s)	3.8	3.8	1.3	1.3	3.3

26: Somerset St & Driveway Performance by lane

Lane	SE	SE	NE	SW	All
Movements Served	L	R	LT	TR	
Denied Del/Veh (s)					0.0
Total Del/Veh (s)	6.7	1.6	3.9	1.0	2.4



27: Driveway Performance by lane

Lane	EB	NW	All
Movements Served	R	L	
Denied Del/Veh (s)			0.1
Total Del/Veh (s)	4.3	2.0	3.2

30: I-295 NB mainline & NB off-ramp Performance by lane

Lane	NB	NB	All
Movements Served	T	TR	
Denied Del/Veh (s)			1.4
Total Del/Veh (s)	130.5	1.7	1.9

36: Preble St & Somerset Performance by lane

Lane	SE	SE	SW	All
Movements Served	LT	T	L	
Denied Del/Veh (s)				0.0
Total Del/Veh (s)	0.3	0.1	6.0	0.3

40: I-295 SB mainline Performance by lane

Lane	SB	SB	SB	All
Movements Served	T	R	R	
Denied Del/Veh (s)				0.0
Total Del/Veh (s)		1.2	0.9	1.1

92: Forest Avenue & High St Performance by lane

Lane	EB	EB	NB	NB	SB	SB	All
Movements Served	L	LR	T	T	T	T	
Denied Del/Veh (s)							29.8
Total Del/Veh (s)	53.6	77.8	166.4	51.3	4.2	2.3	68.5

93: Kennebec St & State St/Marginal Way Performance by lane

Lane	WB	WB	WB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	T	R	T	TR>	<	LT	T	R	
Denied Del/Veh (s)										0.4
Total Del/Veh (s)	61.4	95.8	7.1	7.3	10.8	231.1	194.1	71.3	7.1	34.7

94: Bedford St & Forest Avenue Performance by lane

Lane	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	All
Movements Served	LT	R	L	T	R	L	T	TR	T	TR	
Denied Del/Veh (s)											7.3
Total Del/Veh (s)	67.0	35.4	67.0	49.5	5.2	92.9	36.2	22.2	60.7	113.3	55.3

252: Performance by lane

Lane	EB	SE	SE	SE	NW	NW	All
Movements Served	R	T	T	T	T	T	
Denied Del/Veh (s)							0.0
Total Del/Veh (s)	1075.5	102.0	78.7	14.4	1.3	6.4	34.6

902: Somerset St & Pearl St Performance by lane

Lane	NW	NE	SW	All
Movements Served	LR	TR	LT	
Denied Del/Veh (s)				0.2
Total Del/Veh (s)	39.6	0.9	3.3	19.3

905: Marginal Way & Chestnut St Performance by lane

Lane	SE	SE	NW	NE	NE	SW	SW	All
Movements Served	L	TR	LTR	LT	TR	L	TR	
Denied Del/Veh (s)								0.0
Total Del/Veh (s)	21.2	12.9	13.8	20.5	12.8	25.5	16.9	16.0

Total Network Performance

Denied Del/Veh (s)			46.0
Total Del/Veh (s)			128.1

Queuing and Blocking Report  
2018 PM Design Hour Volumes

11/14/2014

Intersection: 1:

Movement	EB	EB	B85	B85	B55	WB
Directions Served	T	T	T	T	T	R
Maximum Queue (ft)	188	194	124	100	3	106
Average Queue (ft)	62	59	19	16	0	4
95th Queue (ft)	237	227	127	119	2	49
Link Distance (ft)	210	210	353	353	222	322
Upstream Blk Time (%)	13	11	0	0		
Queuing Penalty (veh)	31	26	1	0		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: Marginal Way

Movement	SE	SE	SE	NW	NW	NW	NE	NE	SW	SW	SW
Directions Served	L	LT	TR	L	T	TR	L	TR	L	T	R
Maximum Queue (ft)	210	367	267	175	270	259	84	315	296	575	225
Average Queue (ft)	168	223	132	142	206	198	55	144	67	240	163
95th Queue (ft)	249	323	238	220	282	269	97	250	185	436	264
Link Distance (ft)		844	844		225	225		875		640	
Upstream Blk Time (%)					10	9				0	
Queuing Penalty (veh)					53	47				1	
Storage Bay Dist (ft)	185			150			60		300		200
Storage Blk Time (%)	1	14		4	21		11	27	0	9	3
Queuing Penalty (veh)	2	35		13	51		38	23	0	48	14

Intersection: 7: Somerset/Somerset St & Chestnut St

Movement	SE	NW	NE	SW
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	123	78	64	107
Average Queue (ft)	60	47	33	61
95th Queue (ft)	97	72	52	93
Link Distance (ft)	497	403	464	303
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10: NB off-ramp/NB on-ramp

Movement	EB	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	R	R	R
Maximum Queue (ft)	341	342	328	182	187	295	287
Average Queue (ft)	221	221	189	23	25	149	132
95th Queue (ft)	435	424	392	117	122	243	227
Link Distance (ft)	322	322	322	137	137	866	866
Upstream Blk Time (%)	30	24	15	0	0		
Queuing Penalty (veh)	48	38	24	4	4		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 11:

Movement	WB	SE	SE	SE	NW	NW
Directions Served	R	T	T	T	T	T
Maximum Queue (ft)	466	382	393	422	34	107
Average Queue (ft)	415	159	161	255	1	14
95th Queue (ft)	525	420	408	561	20	63
Link Distance (ft)	416	249	249	249	148	148
Upstream Blk Time (%)	81	22	21	49	0	0
Queuing Penalty (veh)	0	115	111	256	0	1
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 13: Somerset & Elm St & Elm

Movement	NW	NW	NE	SW
Directions Served	L	LR	T	TR
Maximum Queue (ft)	92	64	107	207
Average Queue (ft)	11	6	46	76
95th Queue (ft)	57	36	85	147
Link Distance (ft)	528	528	156	464
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14:

Movement	SE	SE	SE	NW	NW	NW
Directions Served	T	T	T	T	T	TR
Maximum Queue (ft)	137	148	223	93	100	221
Average Queue (ft)	19	35	126	11	12	25
95th Queue (ft)	91	125	287	82	84	129
Link Distance (ft)	133	133	133	249	249	249
Upstream Blk Time (%)	2	1	42	0	0	0
Queuing Penalty (veh)	8	4	202	1	0	1
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 15: Marginal Way & Franklin Street

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	TR	LT	R
Maximum Queue (ft)	136	233	207	188	384	437	444	422	393	253	217
Average Queue (ft)	94	203	185	155	254	254	283	213	167	118	105
95th Queue (ft)	160	234	207	212	377	427	428	398	323	216	187
Link Distance (ft)		137	137	137		426	426	992	992	481	
Upstream Blk Time (%)	4	56	54	18		2	1				
Queuing Penalty (veh)	0	206	198	65		15	8				
Storage Bay Dist (ft)	50				350						150
Storage Blk Time (%)	51	65			5	1				7	3
Queuing Penalty (veh)	177	72			34	4				15	5

Intersection: 16:

Movement	EB	WB	SE	SE	B22	B22	NW	NW	NW
Directions Served	R	R	T	T	T	T	T	T	T
Maximum Queue (ft)	343	180	134	237	212	231	167	182	159
Average Queue (ft)	222	81	10	129	53	86	46	54	41
95th Queue (ft)	432	201	71	282	174	249	184	203	154
Link Distance (ft)	325	200	145	145	119	119	133	133	133
Upstream Blk Time (%)	46	15	0	29	1	18	5	5	2
Queuing Penalty (veh)	0	0	2	224	9	136	28	31	15
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 20: Somerset St/Fox St & Franklin Street

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	L	TR	LT	R
Maximum Queue (ft)	248	340	317	225	498	448	206	220	163	182	158
Average Queue (ft)	97	139	164	94	278	238	119	148	59	78	74
95th Queue (ft)	186	239	260	225	452	399	198	221	119	144	128
Link Distance (ft)		426	426		655	655			464	695	
Upstream Blk Time (%)		0	0		0						
Queuing Penalty (veh)		0	0		0						
Storage Bay Dist (ft)	175			150			275	275			100
Storage Blk Time (%)	4	4		0	30		0	0		7	5
Queuing Penalty (veh)	13	5		2	27		0	0		12	5

Intersection: 25: Preble St & Elm

Movement	WB	WB
Directions Served	R	R
Maximum Queue (ft)	163	166
Average Queue (ft)	44	47
95th Queue (ft)	147	149
Link Distance (ft)	257	257
Upstream Blk Time (%)	1	0
Queuing Penalty (veh)	3	3
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 26: Somerset St & Driveway

Movement	SE	SE	NE	SW
Directions Served	L	R	LT	TR
Maximum Queue (ft)	57	81	136	42
Average Queue (ft)	23	29	38	5
95th Queue (ft)	45	53	92	25
Link Distance (ft)	5	5	303	129
Upstream Blk Time (%)	8	5		
Queuing Penalty (veh)	8	5		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 27: Driveway

Movement	EB	NW
Directions Served	R	L
Maximum Queue (ft)	91	64
Average Queue (ft)	46	34
95th Queue (ft)	74	49
Link Distance (ft)	192	5
Upstream Blk Time (%)		5
Queuing Penalty (veh)		7
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 30: I-295 NB mainline & NB off-ramp

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 36: Preble St & Somerset

Movement	SW
Directions Served	L
Maximum Queue (ft)	31
Average Queue (ft)	5
95th Queue (ft)	24
Link Distance (ft)	156
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 40: I-295 SB mainline

Movement

Directions Served  
 Maximum Queue (ft)  
 Average Queue (ft)  
 95th Queue (ft)  
 Link Distance (ft)  
 Upstream Blk Time (%)  
 Queuing Penalty (veh)  
 Storage Bay Dist (ft)  
 Storage Blk Time (%)  
 Queuing Penalty (veh)

Intersection: 92: Forest Avenue & High St

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	T	T	T	T
Maximum Queue (ft)	446	473	554	175	50	25
Average Queue (ft)	394	442	498	172	7	3
95th Queue (ft)	505	484	631	181	31	18
Link Distance (ft)	431	431	513		149	149
Upstream Blk Time (%)	13	48	46			
Queuing Penalty (veh)	0	0	0			
Storage Bay Dist (ft)				150		
Storage Blk Time (%)			65	34		
Queuing Penalty (veh)			198	103		

Intersection: 93: Kennebec St & State St/Marginal Way

Movement	WB	WB	WB	NB	NB	SB	SB	SB	SB
Directions Served	LT	T	R	T	TR>	<	LT	T	R
Maximum Queue (ft)	223	396	265	179	194	334	337	304	307
Average Queue (ft)	147	162	103	69	99	290	285	233	147
95th Queue (ft)	220	282	243	137	166	358	357	329	377
Link Distance (ft)		875		149	149	191	191	191	191
Upstream Blk Time (%)				1	0	83	79	41	3
Queuing Penalty (veh)				5	4	355	337	177	13
Storage Bay Dist (ft)	200		125						
Storage Blk Time (%)	2	23	8						
Queuing Penalty (veh)	15	146	26						



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Intersection: 94: Bedford St & Forest Avenue

Movement	EB	EB	WB	WB	WB	B258	NB	NB	NB	B22	B22	B22
Directions Served	LT	R	L	T	R	T	L	T	TR	T	T	T
Maximum Queue (ft)	411	757	215	289	64	155	225	222	213	227	240	238
Average Queue (ft)	238	240	176	139	8	21	191	191	187	141	154	145
95th Queue (ft)	418	708	237	327	34	123	225	216	221	275	279	275
Link Distance (ft)		948		220		292	119	119	119	145	145	145
Upstream Blk Time (%)		4	5	9		1	72	73	42	33	31	24
Queuing Penalty (veh)		0	0	0		0	297	301	175	136	127	101
Storage Bay Dist (ft)	330		140		75							
Storage Blk Time (%)	5	10	36	2	0							
Queuing Penalty (veh)	25	28	49	5	0							

Intersection: 94: Bedford St & Forest Avenue

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	687	719
Average Queue (ft)	348	425
95th Queue (ft)	667	749
Link Distance (ft)	760	760
Upstream Blk Time (%)	2	12
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 252:

Movement	EB	B9	SE	SE	SE	NW	NW
Directions Served	R	T	T	T	T	T	T
Maximum Queue (ft)	453	421	258	263	255	34	102
Average Queue (ft)	396	277	154	153	171	1	4
95th Queue (ft)	574	564	297	288	319	20	47
Link Distance (ft)	378	411	148	148	148	191	191
Upstream Blk Time (%)	79	55	52	45	42		0
Queuing Penalty (veh)	0	0	269	233	215		1
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 902: Somerset St & Pearl St

Movement	NW	NE	SW
Directions Served	LR	TR	LT
Maximum Queue (ft)	526	20	116
Average Queue (ft)	237	2	41
95th Queue (ft)	467	14	89
Link Distance (ft)	522	129	464
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 905: Marginal Way & Chestnut St

Movement	SE	SE	NW	NE	NE	SW	SW
Directions Served	L	TR	LTR	LT	TR	L	TR
Maximum Queue (ft)	39	62	154	221	271	174	433
Average Queue (ft)	6	22	88	110	135	37	199
95th Queue (ft)	28	53	141	196	238	104	359
Link Distance (ft)		179	497	640	640		992
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	25					150	
Storage Blk Time (%)	4	12				0	11
Queuing Penalty (veh)	2	1				0	5

Network Summary

Network wide Queuing Penalty: 5882
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