THE LINK APARTMENTS

(formerly Liberty Multifamily Development)

TRAFFIC IMPACT ANALYSIS

December 2025

(Revision: 03)

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1. INTRODUCTION

The Link Apartments project is located between South Main Street and South Liberty Street in the proximity of Paul Street in Harrisonburg, Virginia, and necessitates a thorough Traffic Impact Analysis (TIA) to assess the potential effects on the surrounding transportation network. This analysis will provide crucial insights into traffic flow, intersection performance, and necessary improvements to accommodate the anticipated increase in vehicular activity within the adjacent study area. Key components of this TIA include collecting peak hour turning movement counts at critical intersections, evaluating existing and projected traffic conditions, and analyzing potential mitigation measures to ensure efficient and safe traffic operations. The results will inform design decisions and support compliance with city and VDOT regulations, ultimately contributing to the successful implementation of the new development and associated traffic enhancements.

1.1. Executive Summary

This report provides traffic analysis for existing, no-build, build, and post-build conditions for the proposed development of a six-story mixed-use building, containing up to 265 apartment units and approximately 5,000 sq.ft of ground-floor commercial space. The development is to be located on the southern end of Harrisonburg's downtown, between South Main Street and South Liberty Street in the vicinity of Paul Street. The project intends to incorporate a multi-story parking garage, and will facilitate the extension of Paul Street through the development to intersect South Liberty Street. If approved, the project is expected to be completed and open to residents sometime in the year 2027.

The traffic impact study shows that the project can be expected to have little impact on the surrounding roadway network from a controlled delay and queuing perspectives. The nature of the project and its location derives traffic with origin-destinations that are scattered fairly evenly in multiple directions. The mixed-use nature of the development helps to minimize impacts generally associated with commercial / restaurant usage, as many trips are captured internal of the project. The surrounding roadway network, consisting of a grid configuration, helps to disperse all newly generated trips quickly, thereby minimizing overload on any particular intersection. Modeling showed that both controlled delay and queueing increases minimally at all intersection movements within the study area, none of which were deemed to warrant mitigation to be borne by this development.

1.2. Site Location and Study Area

The project's study area is located in the downtown section of Harrisonburg, Virginia. The studied intersections included in the traffic impact analysis are as follows:

1. South Main Street & Grace Street (Signalized)
2. South Main Street & MLK Jr Way (Signalized)
3. South Main Street/South Liberty & Grattan Street (Unsignalized)
4. South Liberty Street & Paul Street (Unsignalized, future intersection)
5. South Main Street & Paul Street (Unsignalized)
6. South Mason Street & Paul Street (Unsignalized)
7. South Liberty Street & West Bruce Street (Signalized)
8. South Main Street & Bruce Street (Signalized)
9. South Mason Street & MLK Jr Way (Signalized)

These intersections will undergo a thorough evaluation to determine existing conditions and project future traffic impacts, ensuring that the proposed developments do not adversely affect local traffic flow and safety. **Figure 1** shows the project's vicinity.

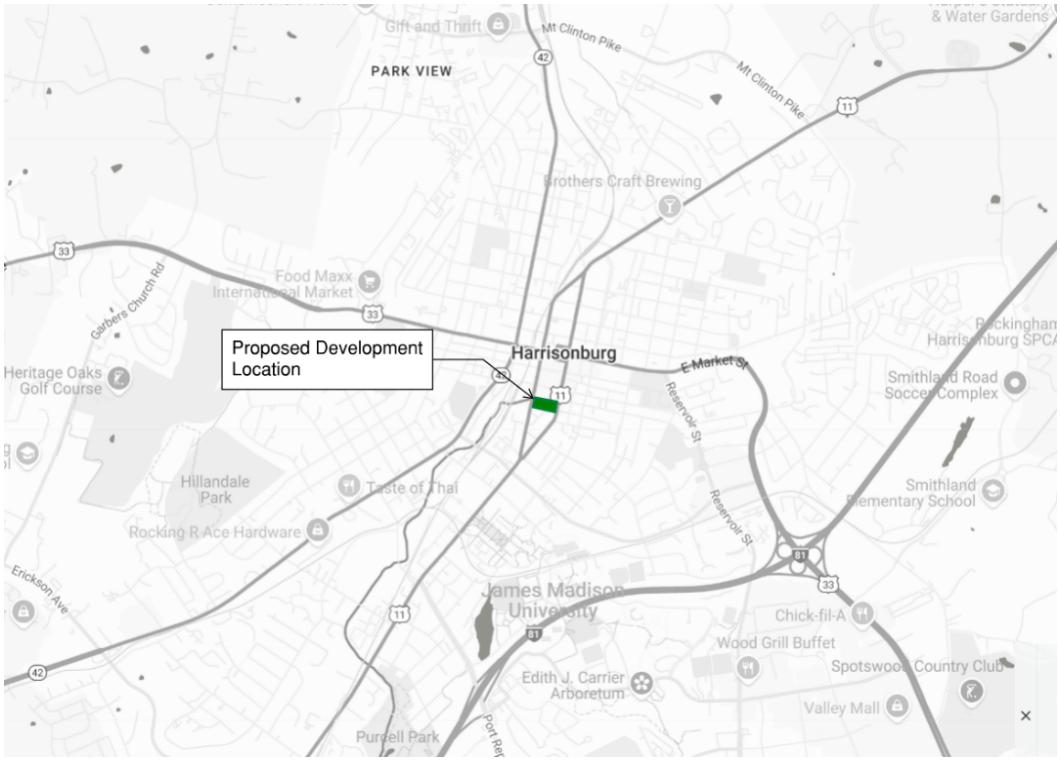

Figure 1 - Vicinity Map

1.3. Exiting Roadway Network

The proposed development is located in the southern section of downtown between South Main Street and South Liberty Street, on the current Lindsey Funeral Home site. Descriptions of the various streets comprising the project's study area are as follows:

South Main Street: serving as the eastern boundary of the development, is a two-lane one-way street serving northbound traffic. VDOT classifies Main Street as a major collector within the study area. Its speed limit is posted as 25 mph.

South Liberty Street: serving as the western boundary of the development, is a two-lane, one-way street serving southbound traffic. VDOT classifies Liberty Street as a minor arterial within the study area. Its speed limit is 25 mph. Plans exist to reduce Liberty Street to a single lane with a two-way cycle track (funded but not yet fully designed); assumed as constructed by the development's build-out year of 2027 for the purpose of this study.

West Bruce Street: is a one-lane, one-way street serving eastbound traffic between South Liberty Street and South Main Street. West of South Liberty St, the road serves two-way traffic with two lanes. Its intersections with South Liberty Street and South Main Street are signalized. VDOT classifies Bruce Street as a minor collector within the study area. Its speed limit is posted as 25 mph.

South Mason Street is a two-lane, two-way street serving both northbound and southbound traffic through the study area**.** VDOT classifies South Mason Street as a major collector within the study area. Its speed limit is posted as 25 mph.

Martin Luther King Jr Way: is a four-lane, two-way street serving east- and westbound traffic. It is a median-divided roadway within the study area. VDOT classifies Martin Luther King Jr Way as minor arterial. Its posted speed limit is 25 mph within the study area.

Paul Street: is a two-lane, two–way street serving east- and westbound traffic between South Main Street and South Mason Street. The proposed development proposes to extend Paul Street to South Liberty Street as a base condition. VDOT classifies it as a minor collector within the study area. It has a posted speed limit of 25 mph.

1.4. Proposed Development

The proposed development includes a 6-story building, containing up to 265 residential units and approximately 5,000 sq. ft. of commercial space on the ground floor, and a 4-story parking garage intended to serve both residents and adjoining public uses (during non-peak hours only). An extension of Paul Street to its south is also included. Currently anticipated configuration of the development is presented below (retail space shaded separately), as **Figure 2**.

Figure 2 - Plan of Development

2. ANALYSIS METHODOLOGY

The methodology used in this analysis follows the standard approach adopted by VDOT, as detailed in the VDOT Traffic Operations and Safety Analysis Manual (TOSAM). It incorporates guidance from the City of Harrisonburg during the TIA Scoping Session held on December 4, 2024. **Appendix A** of this report includes a copy of the scoping form resulting from this session.

2.1. Analysis Scenarios

To evaluate the impact of the project, the following scenarios are examined in this report:

- Existing Conditions (2024)
- Buildout Year (2027), No-Build Condition
- Buildout Year (2027), Build Condition
- 6-Year Post-Build Condition (2033)

Analysis of the various scenarios includes determining the appropriate mitigation necessary to derive reasonable levels of service and queuing within the constraints of the existing infrastructure and right-of-way.

2.2. Analysis Tools

The traffic capacity analysis was performed with Synchro 11, which is a comprehensive software package that allows the user to determine the Level-Of-Service (LOS) for the study intersections based on the control-delay thresholds specified in the Highway Capacity Manual (HCM).

2.3. Measures of Effectiveness

All signalized and unsignalized intersections were analyzed for Levels of Service (LOS) through Synchro utilizing Highway Capacity Manual (2000), with the LOS corresponding to the average delay witnessed per turning movement, per approach, and per intersection. Grades of LOS range from A to F, with A corresponding to the lowest levels of average delay and F corresponding to the worst. The average delay, in seconds, corresponding to each LOS grade is presented in **Table 1.** 95th percentile queue is reported for unsignalized intersections.

Table 1 - Levels of Service and Delay (HCM)

LOS	Signalized Intersection	Unsignalized Intersection
A	≤10 sec	≤10 sec
B	10–20 sec	10–15 sec
C	20–35 sec	15–25 sec
D	35–55 sec	25–35 sec
E	55–80 sec	35–50 sec
F	>80 sec	>50 sec

3. EXISTING CONDITIONS (2024)

The existing condition was modeled for both AM and PM peak hours, with turning movements obtained from a combination of new counts and previous counts provided by the City. This data was combined and the network-wide peak hours were determined. Synchro 11 was used to perform operational analysis. In addition to traffic data collection, field conditions were reviewed during peak hours to ensure compatibility with base model assumptions.

3.1. Data Collection

As part of this study, peak hour turning movement counts were collected in December 2024 at the following intersections:

1. South Main Street & Paul Street
2. South Main Street & Grattan Street
3. South Mason Street & Paul Street

The following intersections' turning movement counts were collected for a different traffic study in November 2023, as provided by the City:

2. South Liberty Street & West Bruce Street
3. South Main Street & East Bruce Street

Recent historic data in downtown area of the city shows that traffic volumes are not significantly changes annually. Therefore, in agreement with the city, traffic volumes were not adjusted for the year difference.

The City of Harrisonburg also provided turning movements for the following intersections from their detection systems, as collected in September 2024.

1. South Main Street & Martin Luther King Jr. Way
2. South Main Street & East Grace Street
3. Martin Luther King Jr. Way & South Mason Street

3.2. Peak Hour Determination

As defined in the study scope, the traffic operational analysis is to be performed for the morning (AM) and evening (PM) peak hours. For isolated intersection analyses, four consecutive 15-

minute intervals of turning movement traffic count data that represent the highest hourly volume should be considered the peak hour. The peak hours were calculated for each intersection and the overall network. The analysis shows that each intersection has a slightly different peak hour during the morning period, but during the evening period, all peak hours fall into the same hour. Since the study intersections are modeled together in one network, the network peak hour is calculated based on combined turning movement counts then applied to each intersection. The peak hours were selected as follows:

- The morning peak (AM) occurred from 8:00 to 9:00,
- The evening peak (PM) occurred from 16:30 to 17:30.

3.3. Network Traffic Volume Balancing

As indicated in section 3.1, the traffic counts were obtained from different sources, and two intersections were collected in 2023. Traffic volume data from different sources, among other factors mentioned in TOSAM, causes imbalances in traffic volumes departing one intersection and arriving at the next. Additionally, the data provided by the City of Harrisonburg for South Main Street & MLK Jr Way is missing northbound right turn counts coming from South Main Street to MLK Jr Way.

Referencing historical data from the Synchro files provided by the City and using an iterative procedure, the right turn turning counts at South Main Street & MLK Jr Way estimated. The other turning movements count balancing deemed unnecessary as no network evaluation planned. **Figure 3** shows the collected AM & PM peak hours turning movement counts, and **Figure 4** shows the complete turning movement counts. Raw count data is presented in **Appendix B**

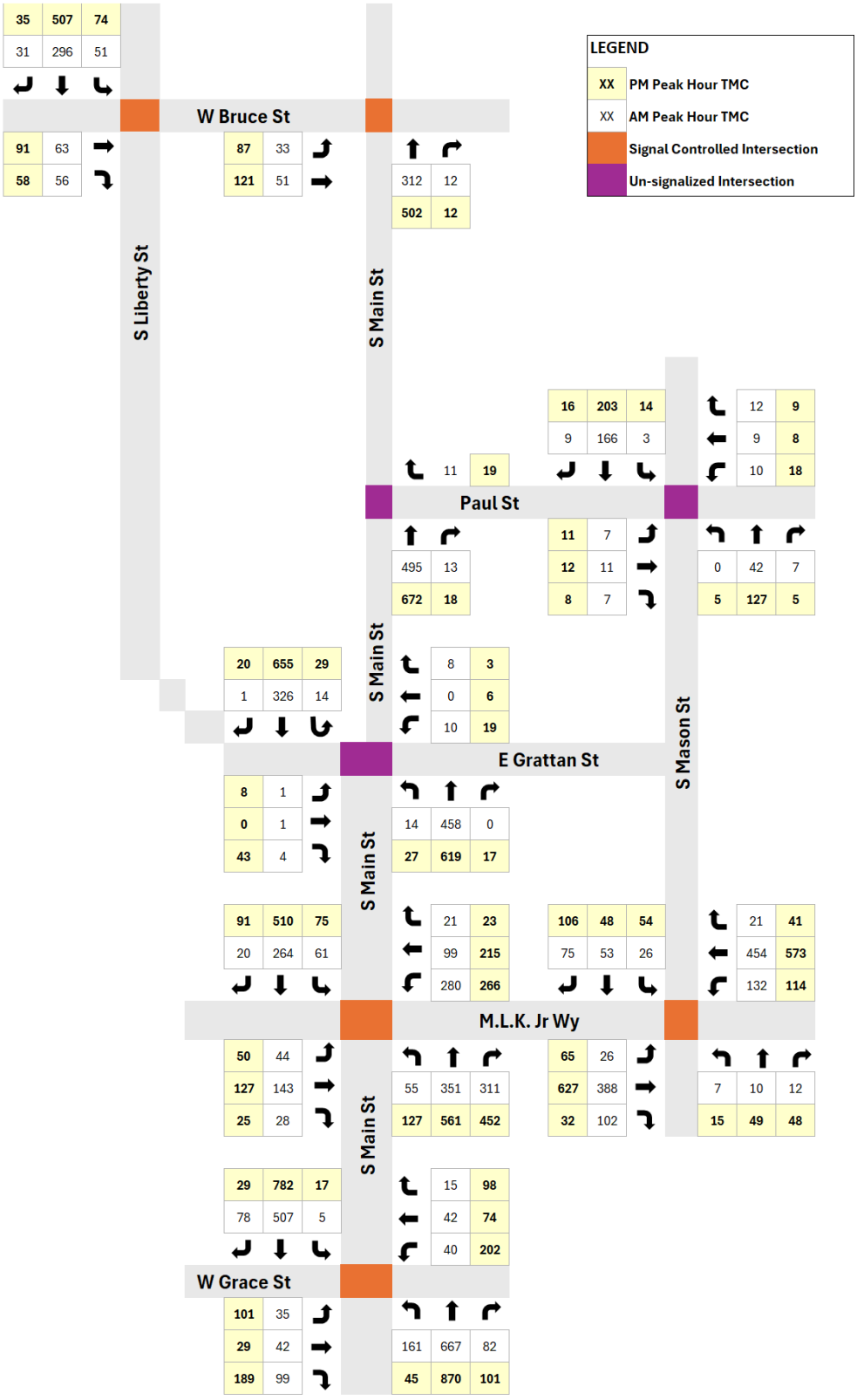

Figure 3 - AM & PM Existing 2024 Collected Turning Movement Counts

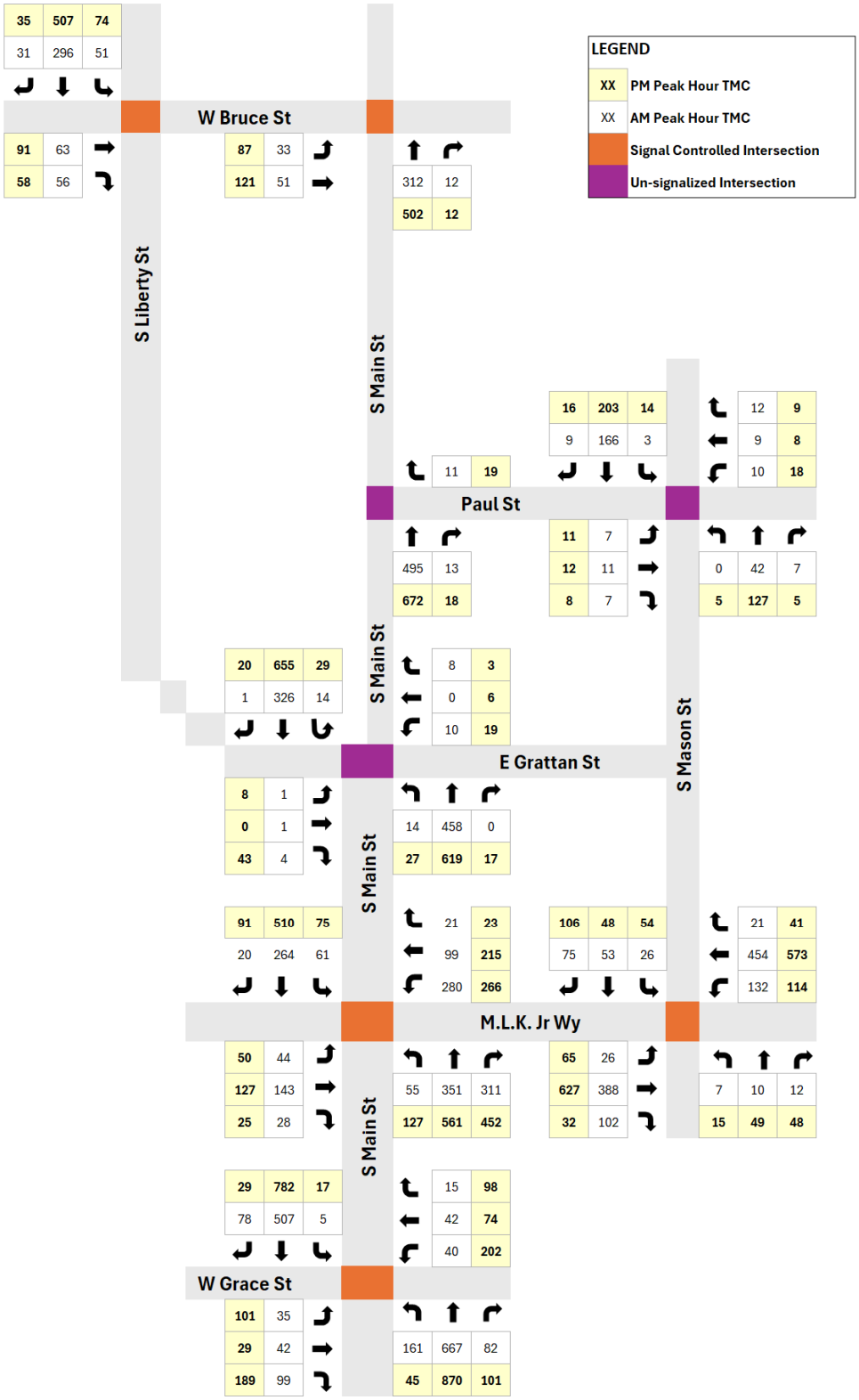

Figure 4 - AM & PM Existing 2024 Complete Turning Movement Counts

3.4. Field Review

The various roadways within the study area were reviewed in the field for pavement conditions, lane configurations, turn lane storage lengths, sight distances, limits of right-of-way, and other factors that could affect proposed mitigation. No modeling adjustments were determined necessary as part of this field analysis.

3.5. Existing 2024 Peak Hour Traffic Conditions

As previously stated, the AM peak hour for the studied intersections has been defined as 08:00 to 09:00, with the PM peak hour defined as 16:30 to 17:30.

The intersections studied were analyzed for the following measures of effectiveness:

- Control delay – measured in seconds per vehicle.
- 95th percentile queue length – measured in feet.

Figures 5, and 6 depict representations of the control delay and queue length for each studied intersection during the 2024 AM and PM peak hours. The HCM 6th Edition methodology was utilized where applicable. At intersections where the configuration is not supported by HCM 6th Ed, HCM 2000 is used.

The analysis results show that the network performs at acceptable levels, with a few exceptions. Three movements show Level of Service (LOS) F during PM Peak Hour: eastbound left turn and westbound through movement at the South Main Street & Grace Street intersection, and westbound left turn movement at the South Main Street & MLK Jr. Way intersection.

Full results of the Synchro Analysis for Existing 2024 Peak Hour Traffic Conditions can be found in **Appendix C**.

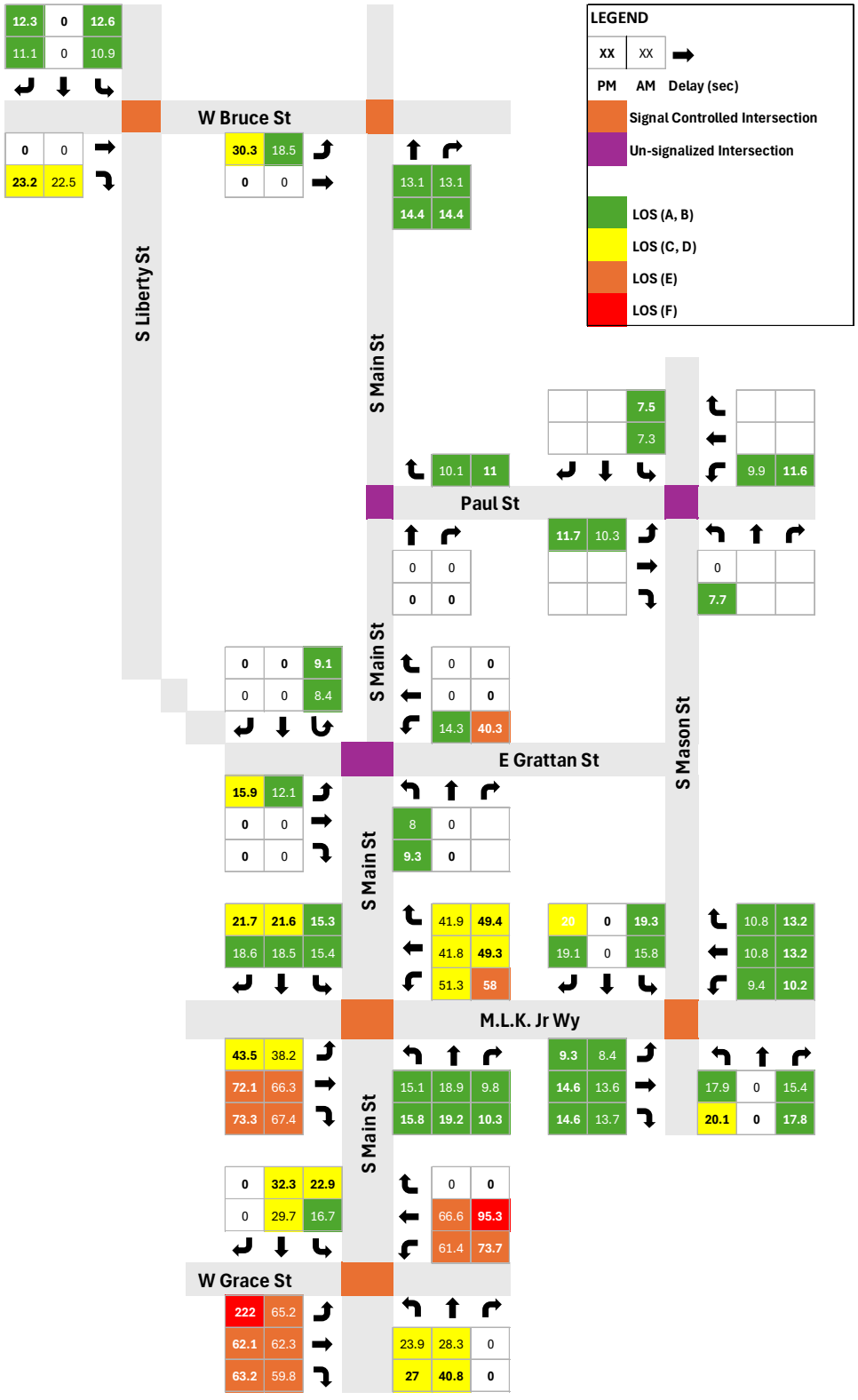

Figure 5 - Existing 2024 AM & PM Delay and LOS

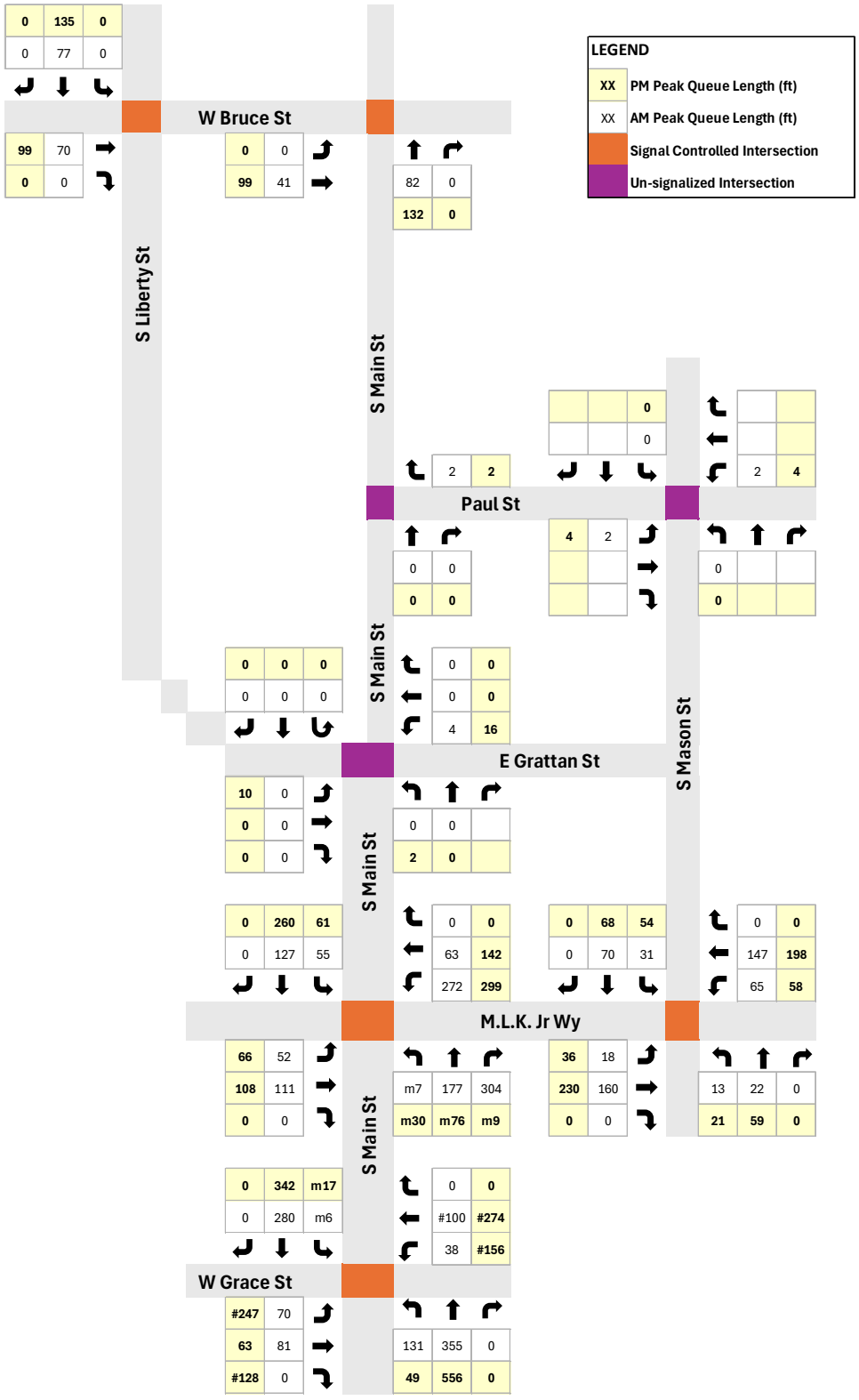

Figure 6 - Existing 2024 AM & PM Peak Hour Queue Length (ft)

4. NO-BUILD TRAFFIC CONDITIONS (2027)

To determine the impact of the proposed development, a comparison of the future conditions of the study intersections must be made. This is done by analyzing the future build-out year with and without the traffic generated by the proposed development. The future year condition without the development is called the no-build condition and is determined by projecting the existing traffic to the build-out year using an annualized growth rate and adding it to traffic from approved (but not yet built) developments in the study

4.1. Background Traffic

Traffic volumes were projected to 2027 using a background growth rate of 1%, as directed by the City during the scoping session. 2027 No-Build turning movement counts are provided on the following page as **Figure 7.**

4.2. No-Build 2027 Peak Hour Traffic Conditions

The existing AM and PM peak-hour Synchro models were used to develop the No-Build models. The signal timing remained the same for the signalized intersections in this scenario, and no adjustments were made to the models regarding traffic signal phasing or geometric factors. The same measures of effectiveness were selected as the existing traffic conditions to report the performance of each study intersection quantitatively.

Figures 8 and 9 include depictive representations of the control delay, LOS, and queue length for each studied intersection during the 2027 No-Build AM and PM peak hours.

Analysis suggests that background traffic operations in the No-Build 2027 condition will not significantly degrade from those witnessed in current conditions.

Results of the Synchro Analysis for No-Build 2027 Peak Hour Traffic Conditions can be found in **Appendix D.**

It should be noted that the westbound left-turn movement of the East Grattan approach to South Main Street potentially warrants further study by the City. Restricting this currently failing movement may be warranted as part of the Liberty Street Improvement project. Further description of this suggestion is included in this project's Conclusion section.

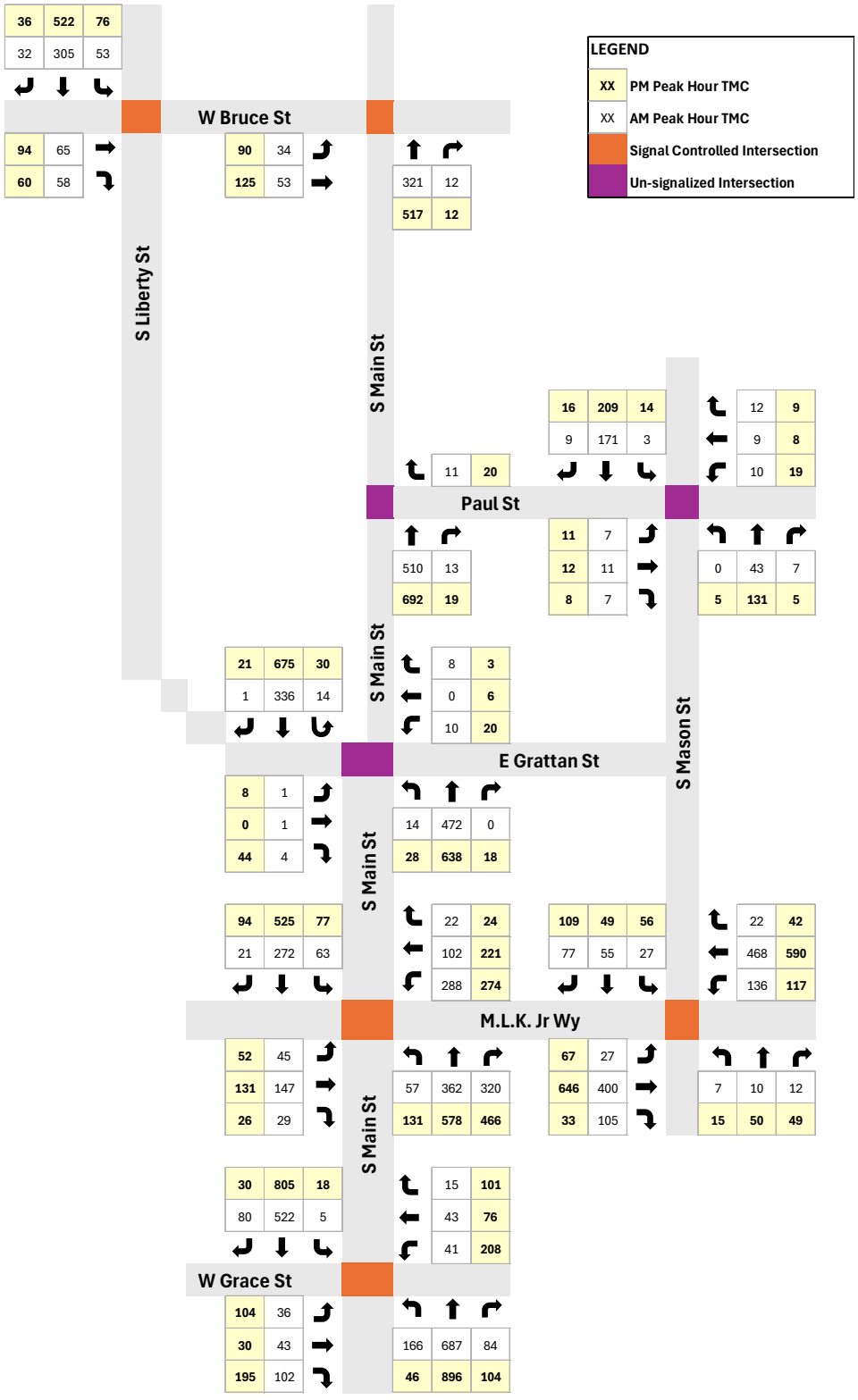

Figure 7 - AM & PM Peak Hour No-Build 2027 Turning Movement Counts

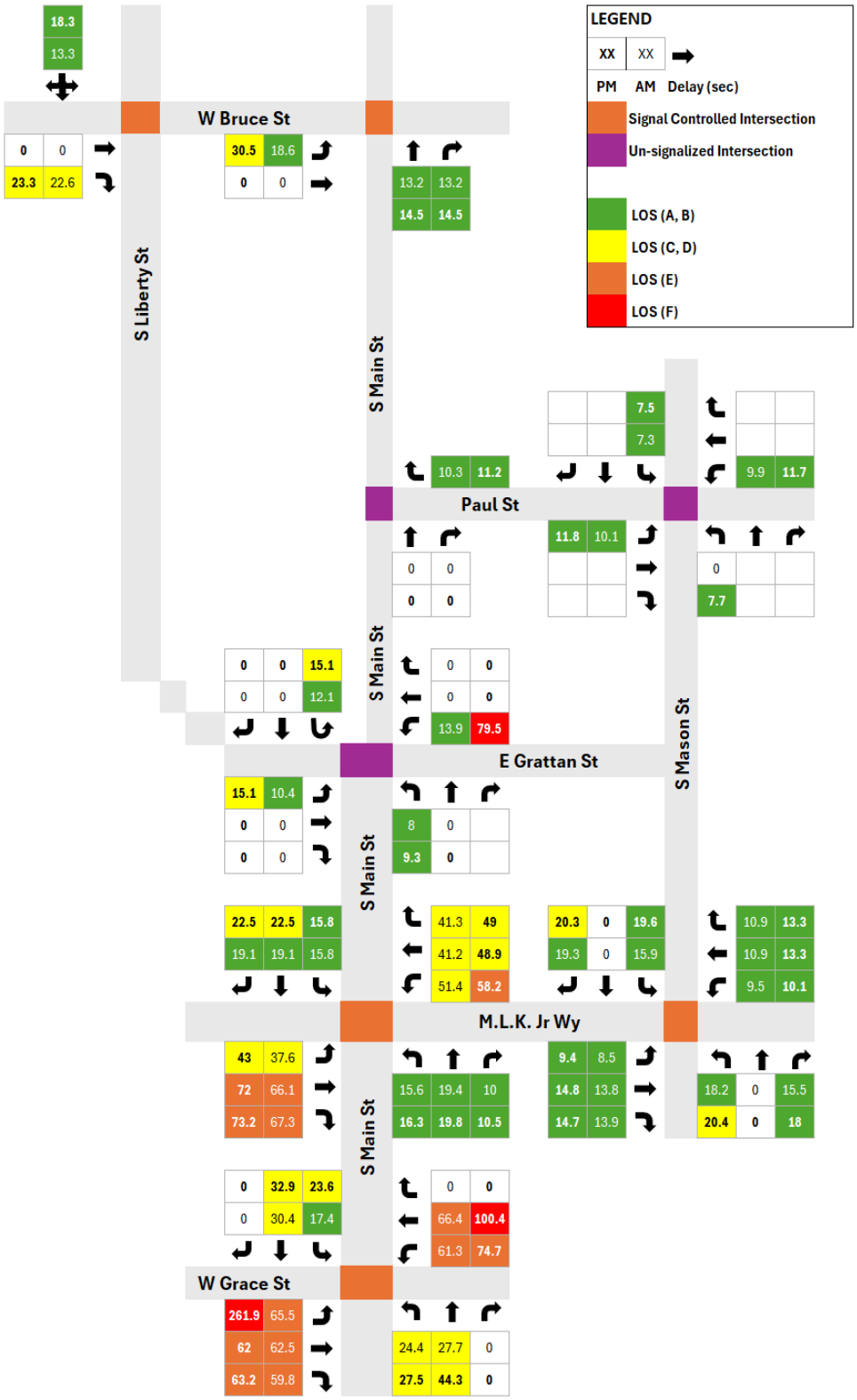

Figure 8 - No-Build 2027 AM & PM Peak Hour Delay and LOS

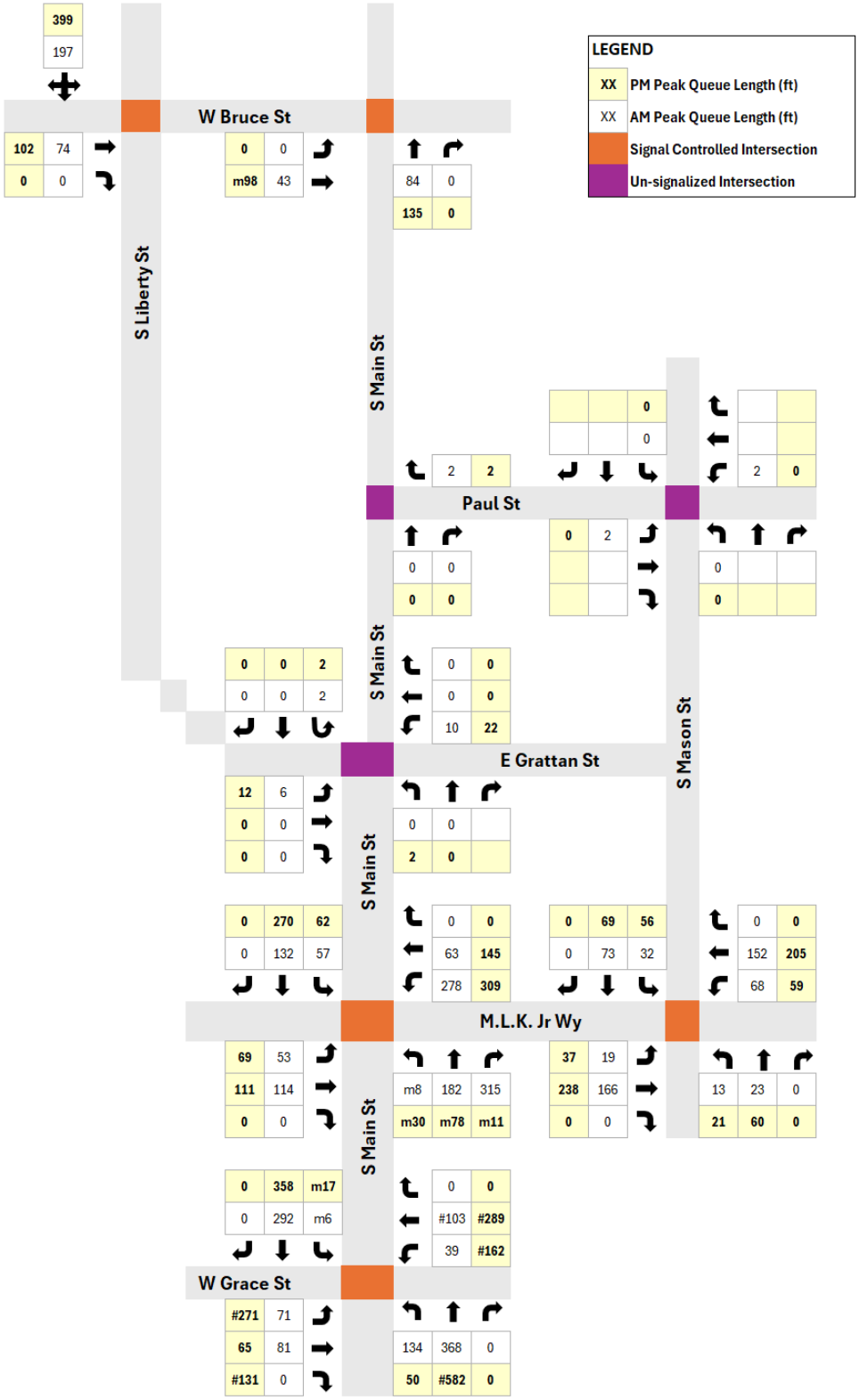

Figure 9 - No-Build 2027 AM & PM Peak Hour Queue Length (ft)

5. BUILD CONDITIONS TRIP ESTIMATION

The methodology of estimating Build conditions trip-loading involved the following steps:

5.1. Trip Generation

The proposed development comprises 265 residential units and approximately 5,000 sq.ft of commercial area. Although the exact use of commercial use is not yet decided, a potential highest trip generator use is assumed, which is Fast-Food Restaurants without Drive-throughs (small cafe or similar). Table 2 shows the trip generation calculation per ITE Trip Generation Manual 11th Edition.

Table 2 - Development Trip Generation Per ITE Trip Generation Manual

No	Use	ITE Code	Unit	Qty	AM			PM		
					Total	Entry	Exit	Total	Entry	Exit
1	Multifamily Housing (Mid-Rise)	221	DU	265	98	23	75	103	63	40
2	Fast-Food Restaurant without Drive-Through	933	1000 Sq. Ft GFA	5.0	216	125	91	166	83	83
				Total	**314**	**148**	**166**	**269**	**146**	**123**

5.2. Internal Capture Trips

Internal capture trips refer to trips in mixed-use developments where trips between different uses (e.g., residential, retail, and office) occur within the development itself, and without requiring external travel on surrounding road networks. This reduces overall traffic demand on public streets as people can walk, bike, or use on-site connections for their trips. The internal trip capture allowance assumed for the proposed development is 30% of the commercial use area. Table 3 shows the calculation of the internal capture trips.

Table 3 - Internal Capture Trips

No	Use	Internal Capture	AM			PM		
			Total	Entry	Exit	Total	Entry	Exit
1	Multifamily Housing (Mid-Rise)	0%	0	0	0	0	0	0
2	Fast-Food Restaurant without Drive-Through	30%	65	38	27	50	25	25
		Total	**65**	**38**	**27**	**50**	**25**	**25**

With internal-capture incorporated, the total trips coming to the site can be calculated as the total generated trips (shown in Table 2) minus the internal capture trips (shown in Table 3). Table 4 shows the total trips to the site.

Table 4 - Total Trips to the site

No	Use	ITE Code	Unit	Qty	AM			PM		
					Total	Entry	Exit	Total	Entry	Exit
1	Multifamily Housing (Mid-Rise)	221	DU	265	98	23	75	103	63	40
2	Fast-Food Restaurant without Drive-Through	933	1000 Sq. Ft GFA	5.0	151	87	64	116	58	58
				Total	**249**	**110**	**139**	**219**	**121**	**98**

5.3. Pass-by Trips

A pass-by trip refers to a trip made by a vehicle that is already traveling on a nearby roadway and stopping at the development without altering its primary route or destination. These trips do not generate new traffic, but rather simply temporarily divert existing traffic to the site. The ITE 12th Edition Trip Generation Manual does not provide a pass-by allowance for ITE Use 933 (Fast-Food restaurant without a Drive-Through) use, but ITE Use 932 (high-turnover sit-down restaurant) has a 43% pass-by allowance, so an allowance of 35% was chosen to be conservative for the use in question.

Table 5 - Pass-by Trips

No	Use	Pass-By Rate	AM			PM		
			Total	Entry	Exit	Total	Entry	Exit
1	Multifamily Housing (Mid-Rise)	0%	0	0	0	0	0	0
2	Fast-Food Restaurant without Drive-Through	35%	53	30	22	41	20	20
		Total	**53**	**30**	**22**	**41**	**20**	**20**

5.4. Total New Trips

The total new trips that will be added to the development's surrounding streets is equal to the total trips generated minus both internally captured trips and pass-by trips. The Table 6 shows total new trips added to the adjacent roadway network.

Table 6 - Total New Trips on Surrounding Streets

No	Use	ITE Code	Unit	Qty	AM			PM		
					Total	Entry	Exit	Total	Entry	Exit
1	Multifamily Housing (Mid-Rise)	221	DU	265	98	23	75	103	63	40
2	Fast-Food Restaurant without Drive-Through	933	1000 Sq. Ft GFA	5.0	98	57	42	75	38	38
				Total	**196**	**80**	**117**	**178**	**101**	**78**

5.5. Distribution and Assignment

The proposed development's primary site trip distribution was determined through a review of existing traffic patterns, surrounding land uses, engineering judgment, and discussions with the City. The distribution is below.

1. 30% to/from south on South Main Street.
2. 35% to/from the southeast on Martin Luther King Jr. Way
3. 5% to/from the southwest on Martin Luther King Jr. Way
4. 10% to/from the northeast on South Mason Street.
5. 10% to/from the north on South Liberty Street.
6. 5% to/from the northwest on South High Street.
7. 5% to/from the northwest on West Market Street.

Figure 6 shows the distribution percentage of incoming and outgoing trips. **Figure 7** shows the number of trips on the study street network.

The total number of trips at site entrances is calculated from the site trips (trip generated minus internally captured trips). The number of trips on the surrounding streets is calculated from the distribution percentages applied to new trips only (trip generated minus internal capture trips and pass-by trips)

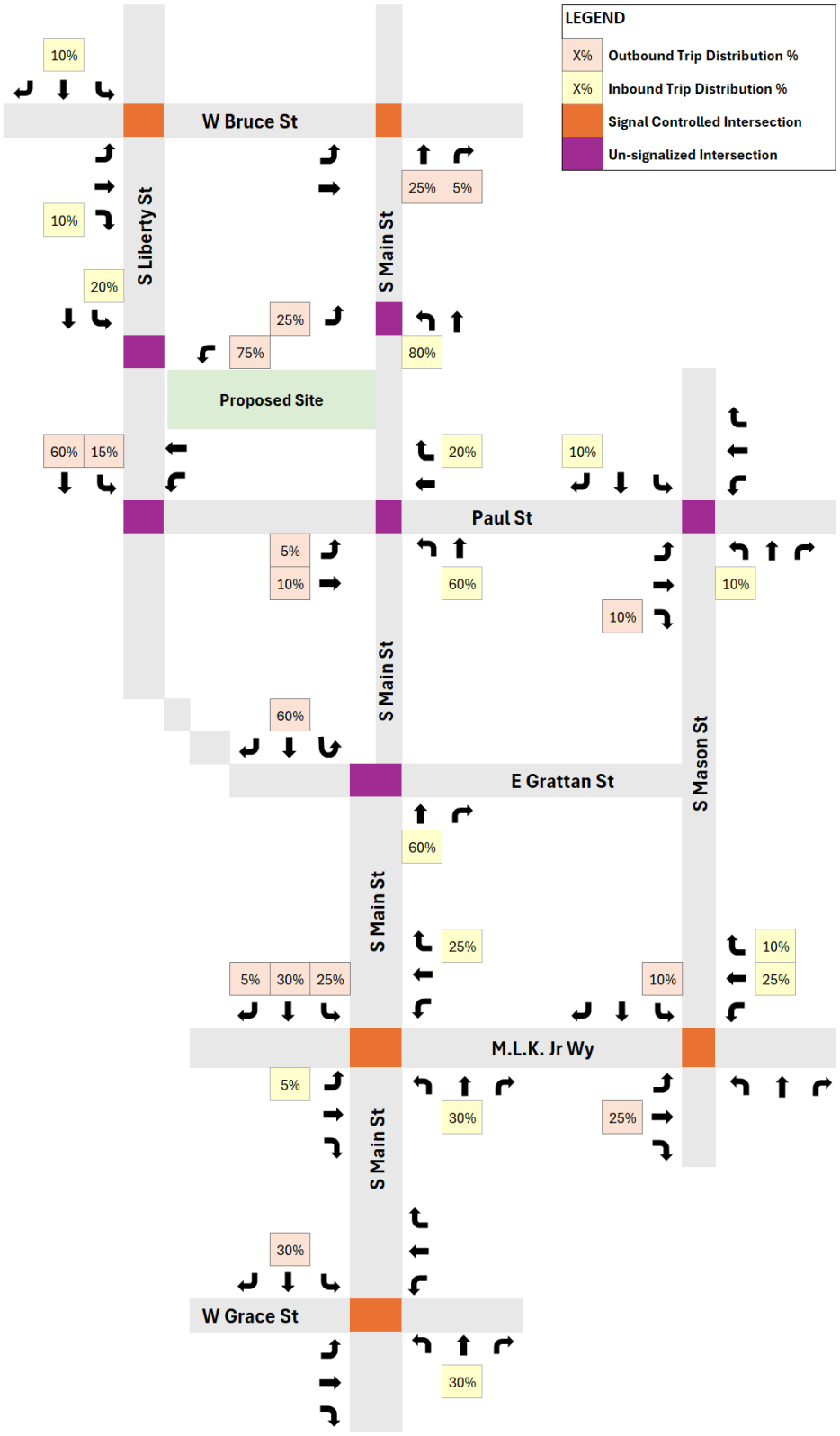

Figure 10 - New Trip Distribution Percentage

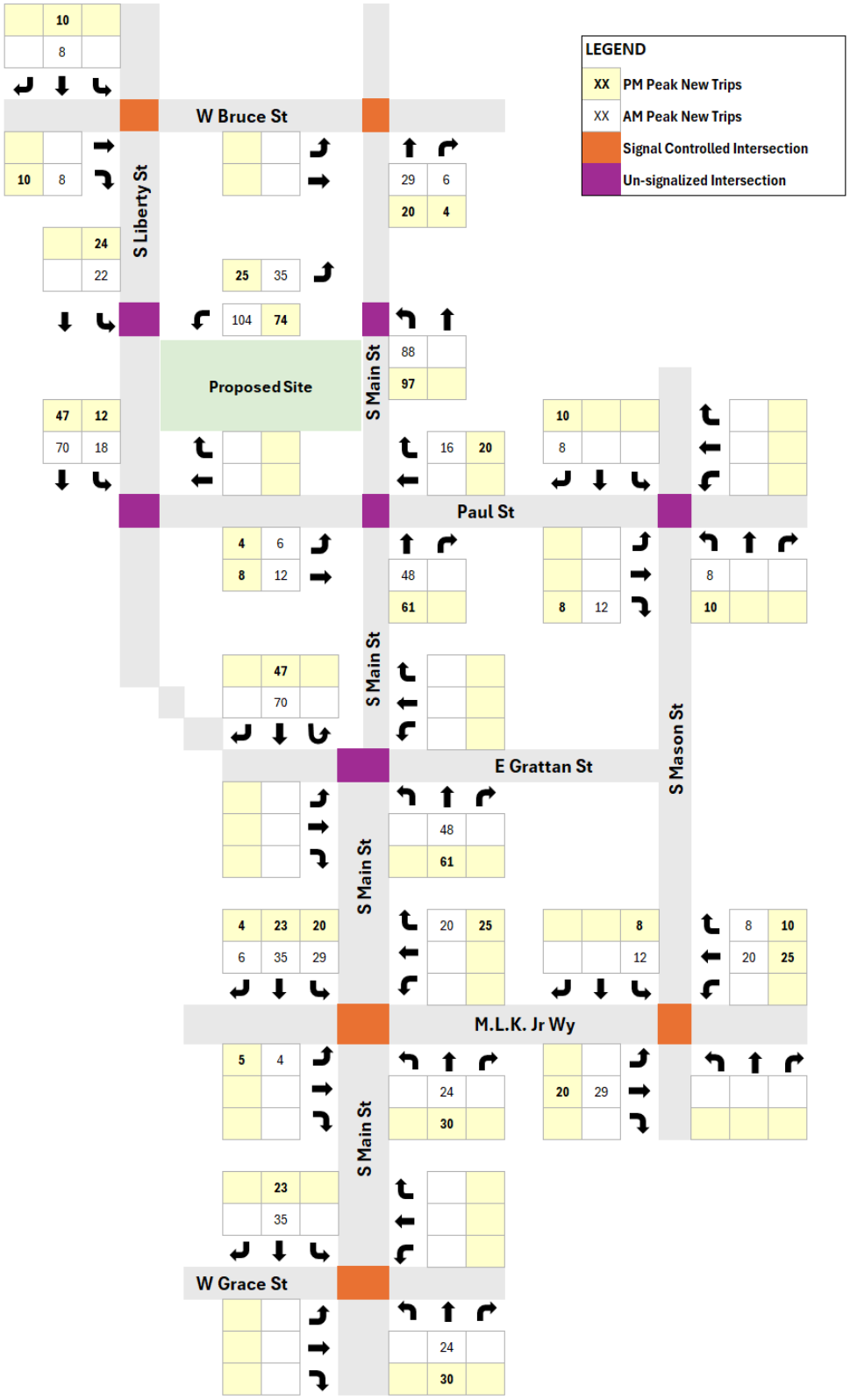

Figure 11 - Total AM & PM Site Trips

6. BUILD TRAFFIC CONDITIONS (2027)

The Build scenario represents the project completion with any/all street changes implemented. It is determined by combining the No-Build scenario's background traffic condition and the Build condition's trip assignments.

6.1. Build 2027 Peak Hour Traffic Conditions

The Build 2027 condition's AM and PM peak-hour turning movement counts were used to develop the Build Synchro models. The South Liberty Street proposed bike lane and lane configuration is assumed to be constructed in this scenario. Then, the same measures of effectiveness were selected as the No-Build traffic conditions to report the performance of each studied intersection quantitatively.

Figures 13 and 14 include depictive representations of the control delay, LOS, and queue length for each studied intersection during the AM and PM peak hours.

While the overall level of service did not increase for any intersection between the 2027 No-Build and Build conditions, two individual movements did decrease in LOS. The NBT movement at Martin Luther King Jr. Way & S Main Street decreased to LOS C during the PM peak, and the WBL movement at Grattan Street and S Main Street decreased to LOS C in the AM peak. The increase in delay for the NBT movement at the Martin Luther King Jr. Way & S Main Street intersection increased by 1.1 seconds per vehicle, which Public Works does not consider significant enough to necessitate mitigation. The increase in delay for the WBL movement at the Grattan Street & S Main Street intersection, the increase is 5.2 seconds of delay per vehicle. This increase would require more investigation for potential mitigation; however, Public Works notes that the upcoming Liberty Street proposes acceptable mitigations that negate the conflicts leading to the increased delay for the WBL movement.

The proposed site access and extension of Paul Street show acceptable operational conditions in terms of delays and queues.

Results of the Synchro Analysis for Build 2027 Peak Hour Traffic Conditions can be found in **Appendix E**.

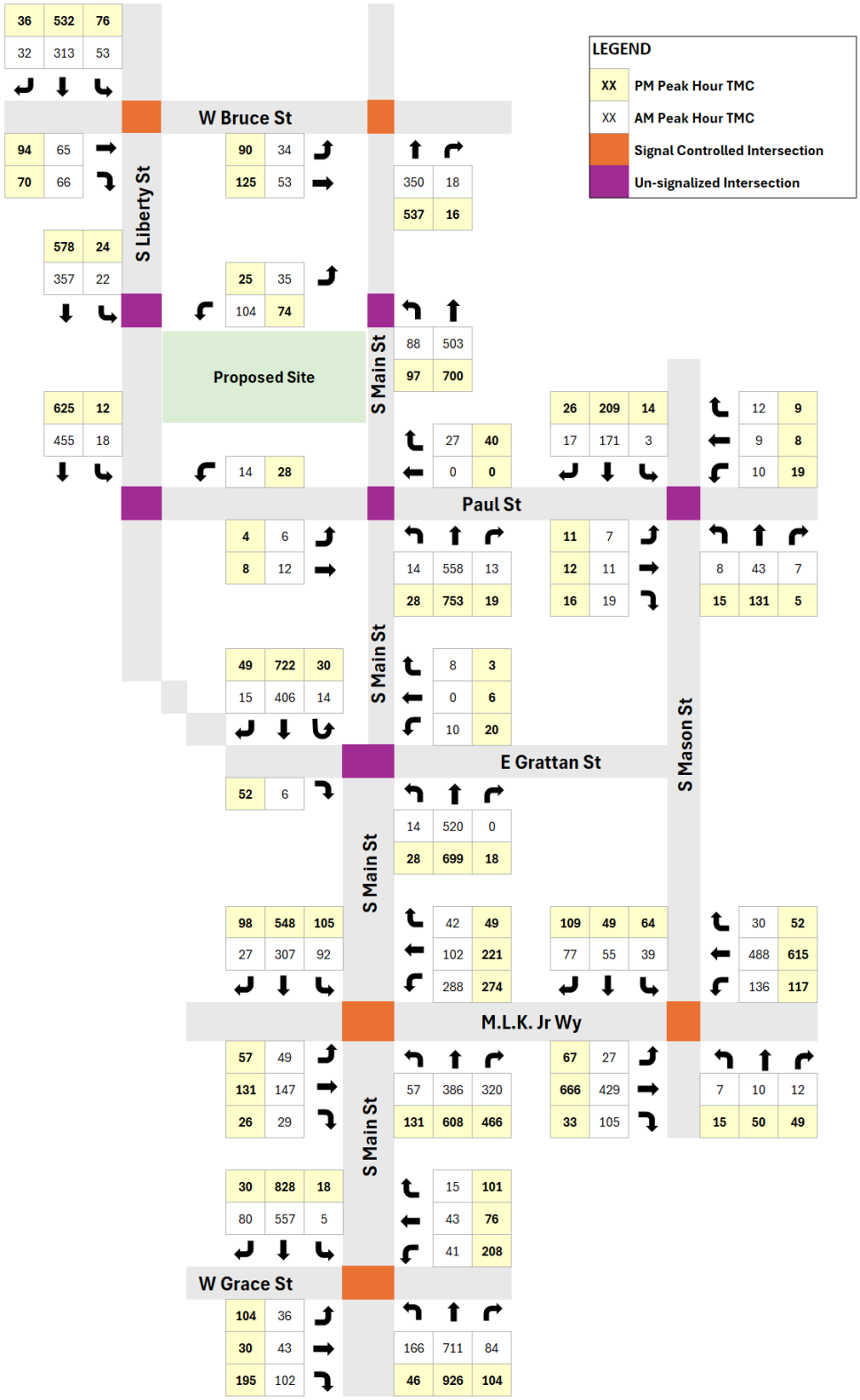

Figure 12 - Build 2027 AM & PM Peak Hour Turning Movement Counts

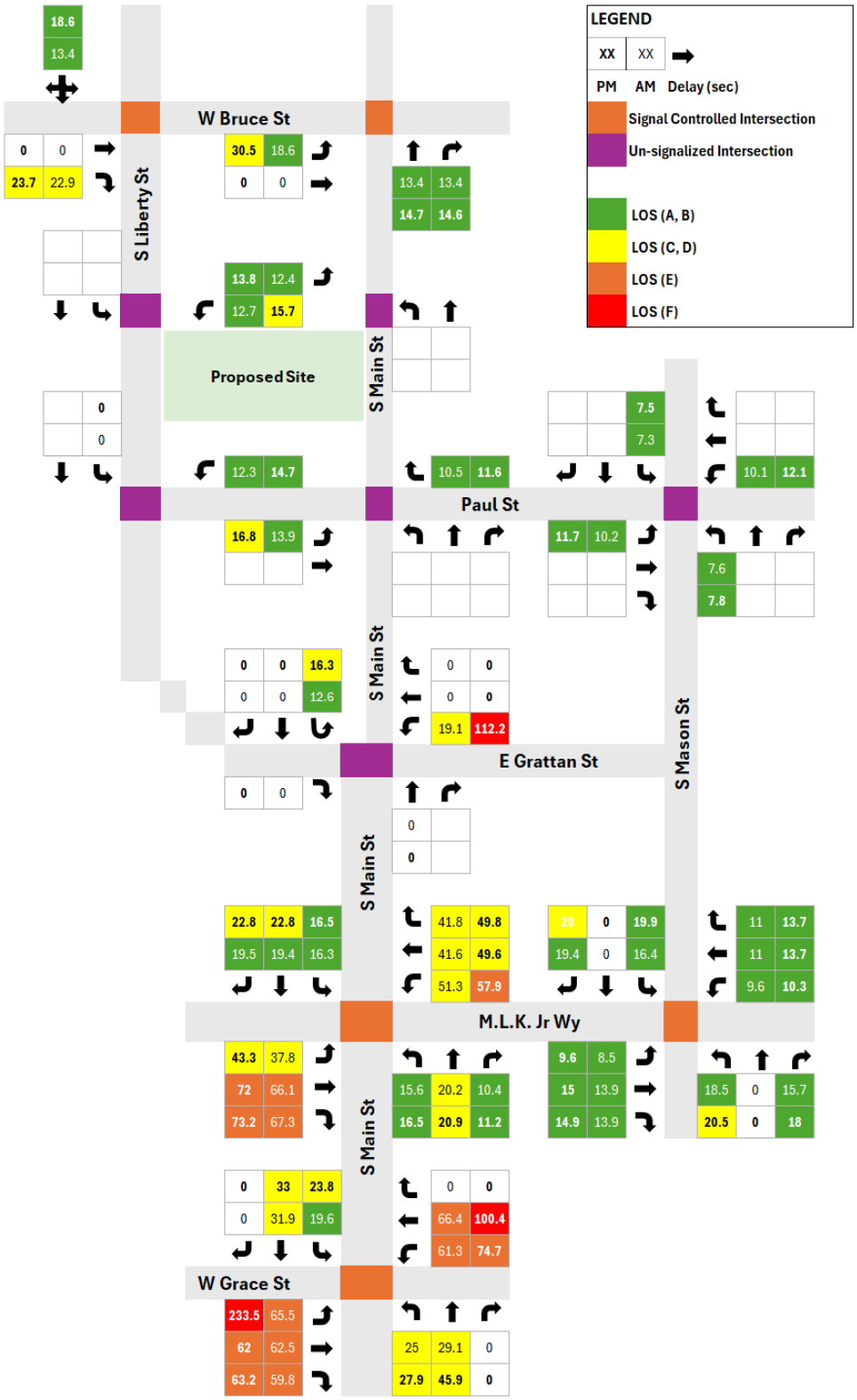

Figure 13 - Build 2027 AM & PM Peak Hour Delay and LOS

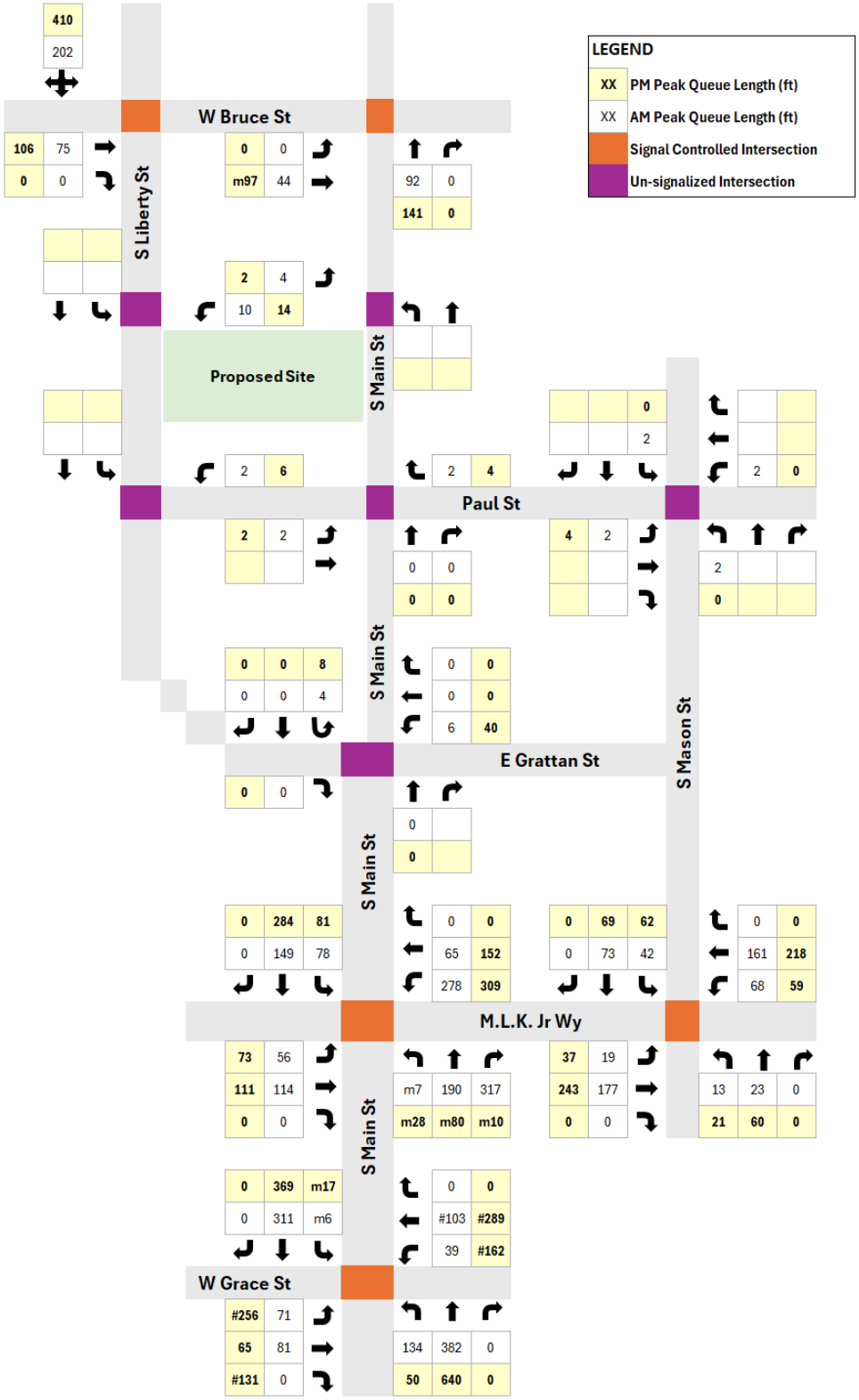

Figure 14 - Build 2027 AM & PM Peak Hour Queue Length (ft)

6.2. Build 2027 Peak Hour Turning Movement Counts

Build (2027) conditions were determined by adding the No-Build (2027) traffic volumes (**Figure 7**) with the total site trips (**Figure 11**). **Figure 12** shows the projected build (2027) peak hour traffic volumes.

6.3. Post-Build 2033 Peak Hour Traffic Conditions

As a sensitivity test, a six-year post-build condition scenario was developed. Based on Build 2027 turning movement counts, the scenario assumes continued background growth of 1% annually; site trips are unaffected. **Figure 15** shows Post-Build 2033 AM and PM peak hour turning movement counts.

Figures 16 and 17 depict control delay, LOS, and queue length for each intersection studied during the Post-Build 2033 AM and PM peak hours.

The analysis shows that the network operates at acceptable traffic conditions, excepting the limited movements previously denoted as failing. Due to an increase in traffic volumes, delays are slightly increased for all movements, but the increase is not significant enough to change the LOS of the movements or warrant mitigation.

Results of the Synchro Analysis for Post-Build 2033 Peak Hour Traffic Conditions can be found in **Appendix F**.

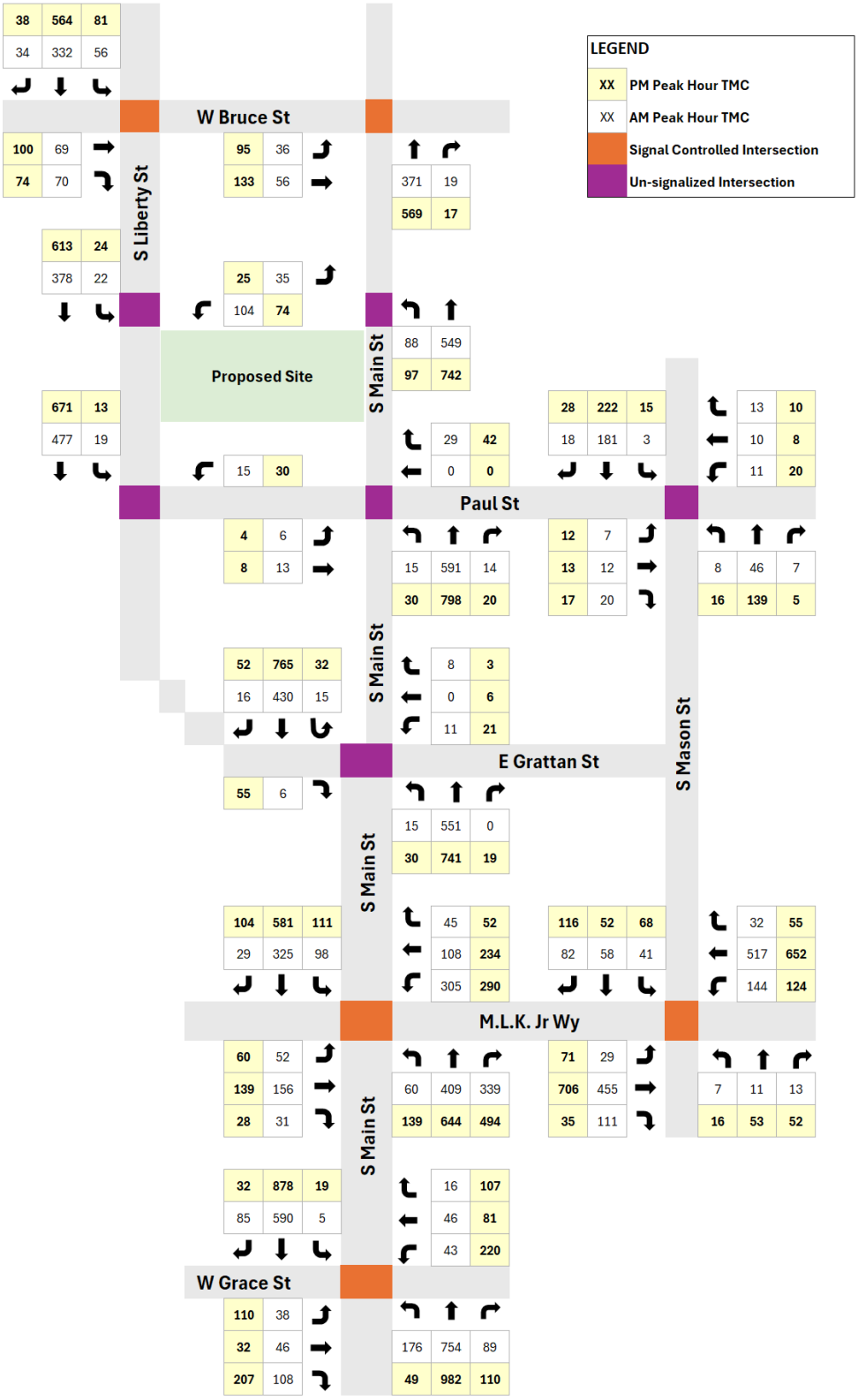

Figure 15 - Post-Build 2033 AM & PM Peak Hour TMC

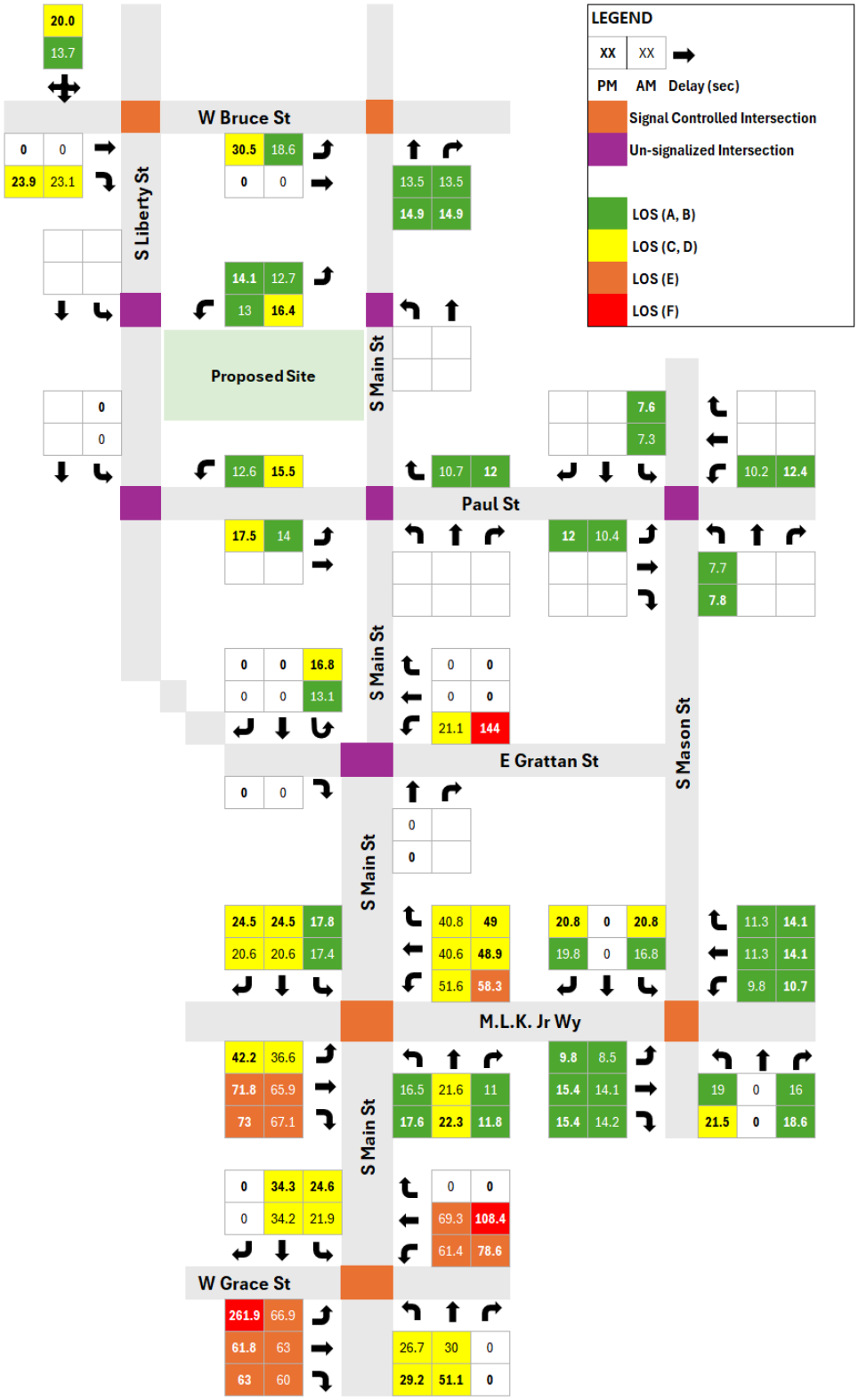

Figure 16 - Post Build 2033 AM & PM Peak Hour Delay and LOS

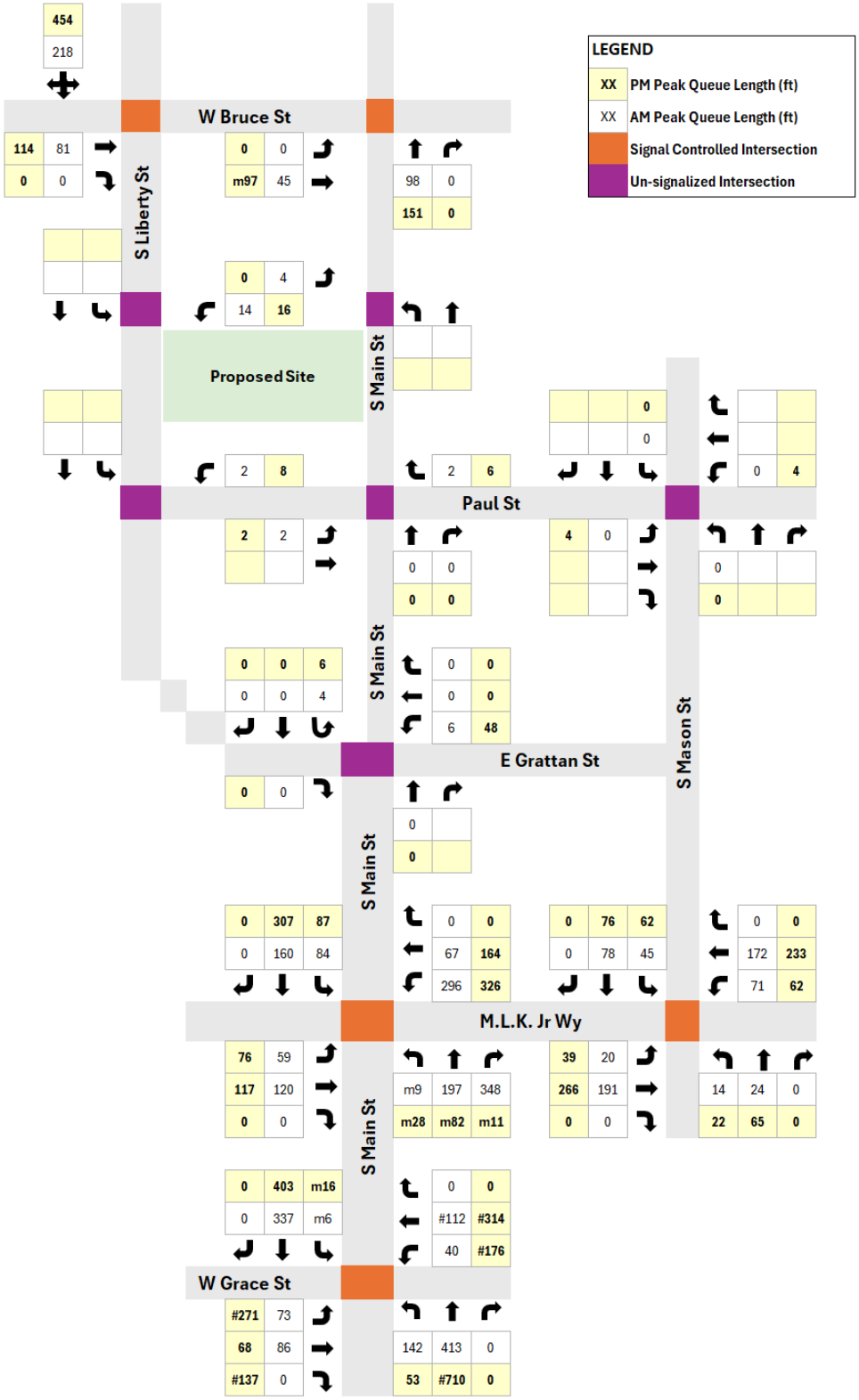

Figure 17 - Post Build 2033 AM & PM Peak Hour Queue Length (ft)

7. CONCLUSION

The traffic impact study shows that the proposed Link Apartments, inclusive of its proposed 5,000 sf of commercial / restaurant use, can be expected to have little impact on the surrounding roadway network from a controlled delay and queuing perspectives. The nature of the project and its location derives traffic with origin-destinations that are scattered fairly evenly in multiple directions. The mixed-use nature of the development helps to minimize impacts generally associated with commercial / restaurant usage, as many trips are captured internal of the project. The surrounding roadway network, consisting of a grid configuration, helps to disperse all newly generated trips quickly, thereby minimizing overload on any particular intersection. Modeling showed that both controlled delay and queueing increases minimally at all intersection movements within the study area, none of which were deemed to warrant mitigation.

This study does note, however, three movements within the study area that are failing in present day, even without the proposed development. As the proposed development is expected to have very little impact upon those movement delays/queues, no mitigation was studied as part of this report. Such movements may warrant further study by the City, however. In particular, the westbound left-turn movement on the East Grattan approach to S Main St may want to be analyzed for closure as part of the Liberty St improvements, as this intersection's geometry is less than ideal, and the movement can easily be served elsewhere within the system. As no volume of this movement's traffic is generated by the Link Apartments project, this potential mitigation scenario is included in this report as merely a suggestion for further study.

7.1. Summary Tables

Table 8 - Analysis Summary of South Main Street & East Grace Street Intersection

South Main Street & East Grace Street															
			Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Existing 2024	AM	LOS	C	E	E	E	E	E		C	C		B	C	
		Delay	31.9	65.2	62.3	59.8	61.4	66.6		23.9	28.3		16.7	29.7	
		95th Queue		70	81	0	38	#100		131	355		m6	280	
	PM	LOS	D	F	E	E	E	F		C	D		C	C	
		Delay	53.2	221.9	62.1	63.2	73.7	95.3		27	40.8		22.9	32.3	
		95th Queue		#247	63	#128	#156	#274		49	556		m17	342	
No-Build 2027	AM	LOS	C	E	E	E	E	E		C	C		B	C	
		Delay	34	65.5	62.5	59.8	61.3	66.4		24.4	27.7		17.4	30.4	
		95th Queue		71	81	0	39	#103		134	368		m6	292	
	PM	LOS	E	F	E	E	E	F		C	D		C	D	
		Delay	57.2	261.9	62.0	63.2	74.7	100.4		27.5	44.3		23.6	32.9	
		95th Queue		#271	65	#131	#162	#289		50	#582		m17	358	
Build 2027	AM	LOS	C	E	E	E	E	E		C	C		B	C	
		Delay	34.7	65.5	62.5	59.8	61.3	66.4		25	29.1		19.6	31.9	
		95th Queue		71	81	0	39	#103		134	382		m6	311	
	PM	LOS	E	F	E	E	E	F		C	D		C	D	
		Delay	55.9	233.5	62	63.2	74.7	100.4		27.9	45.9		23.8	33	
		95th Queue		#256	65	#131	#162	#289		50	640		m17	369	
Post Build 2033	AM	LOS	D	E	E	E	E	E		C	C		C	C	
		Delay	36.1	66.9	63	60	61.4	69.3		26.7	30		21.9	34.2	
		95th Queue		73	86	0	40	#112		142	413		m6	337	
	PM	LOS	E	F	E	E	E	F		C	D		C	C	
		Delay	60.3	261.9	61.8	63	78.6	108.4		29.2	51.1		24.6	34.3	
		95th Queue		#271	68	#137	#176	#314		53	#710		m16	403	

Table 9 - Analysis Summary of South Main Street & Martin Luther King Jr. Way Intersection

South Main & Martin Luther King Jr Way															
			Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Existing 2024	AM	LOS	C	D	E	E	D	D	D	B	B	A	B	B	B
		Delay	29.3	38.2	66.3	67.4	51.3	41.8	41.9	15.1	18.9	9.8	15.4	18.5	18.6
		95th Queue		52	111		272	63		m7	177	304	55	127	
	PM	LOS	C	D	E	E	E	D	D	B	B	B	B	C	C
		Delay	28.5	43.5	72.1	73.3	58	49.3	49.4	15.8	19.2	10.3	15.3	21.6	21.7
		95th Queue		66	108		299	142		m30	m76	m9	61	260	
No-Build 2027	AM	LOS	C	D	E	E	D	D	D	B	B	A	B	B	B
		Delay	29.6	37.6	66.1	67.3	51.4	41.2	41.3	15.6	19.4	10	15.8	19.1	19.1
		95th Queue		53	114		278	63		m8	182	315	57	132	
	PM	LOS	C	D	E	E	E	D	D	B	B	B	B	C	C
		Delay	28.9	43.0	72.0	73.2	58.2	48.9	49.0	16.3	19.8	10.5	15.8	22.5	22.5
		95th Queue		69	111		309	145		m30	m78	m11	62	270	
Build 2027	AM	LOS	C	D	E	E	D	D	D	B	B	B	B	C	C
		Delay	29.5	37.8	66.1	67.3	51.3	41.6	41.8	15.6	20.2	10.4	16.3	19.4	19.5
		95th Queue		56	114		278	65		m7	190	317	78	149	
	PM	LOS	C	D	E	E	E	D	D	B	C	B	B	C	C
		Delay	29.3	43.3	72	73.2	57.9	49.6	49.8	16.5	20.9	11.2	16.5	22.8	22.8
		95th Queue		73	111		309	152		m28	m80	m10	81	284	
Post Build 2033	AM	LOS	C	D	E	E	D	D	D	B	C	B	B	C	C
		Delay	30.1	36.6	65.9	67.1	51.6	40.6	40.8	16.5	21.6	11	17.4	20.6	20.6
		95th Queue		59	120		296	67		m9	197	348	84	160	
	PM	LOS	C	D	E	E	E	D	D	B	C	B	B	C	C
		Delay	30.2	42.2	71.8	73	58.3	48.9	49	17.6	22.3	11.8	17.8	24.5	24.5
		95th Queue		76	117		326	164		m28	m82	m11	87	307	

Table 10 - Analysis Summary of South Mason Street & Martin Luther King Jr. Way Intersection

South Mason & Martin Luther King Jr Way														
			Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Existing 2024	AM	LOS	B	A	B	B	A	B	B	B	A	B	B	A	B
		Delay	12.7	8.4	13.6	13.7	9.4	10.8	10.8	17.9	0.0	15.4	15.8	0.0	19.1
		95th Queue		18	160		65	147		13	22		31	70	
	PM	LOS	B	A	B	B	B	B	B	C	A	B	B	A	C
		Delay	14.4	9.3	14.6	14.6	10.2	13.2	13.2	20.1	0	17.8	19.3	0	20
		95th Queue		36	230		58	198		21	59		54	68	
No-Build 2027	AM	LOS	B	A	B	B	A	B	B	B	A	B	B	A	B
		Delay	12.8	8.5	13.8	13.9	9.5	10.9	10.9	18.2	0	15.5	15.9	0	19.3
		95th Queue		19	166		68	152		13	23		32	73	
	PM	LOS	B	A	B	B	B	B	B	C	A	B	B	A	C
		Delay	14.6	9.4	14.8	14.7	10.1	13.3	13.3	20.4	0.0	18.0	19.6	0.0	20.3
		95th Queue		37	238		59	205		21	60		56	69	
Build 2027	AM	LOS	B	A	B	B	A	B	B	B	A	B	B	A	B
		Delay	12.9	8.5	13.9	13.9	9.6	11	11	18.5	0	15.7	16.4	0	19.4
		95th Queue		19	177		68	161		13	23		42	73	
	PM	LOS	B	A	B	B	B	B	B	C	A	B	B	A	C
		Delay	14.8	9.6	15	14.9	10.3	13.7	13.7	20.5	0	18	19.9	0	20
		95th Queue		37	243		59	218		21	60		62	69	
Post Build 2033	AM	LOS	B	A	B	B	B	B	B	B	A	B	B	A	B
		Delay	13.2	8.5	14.1	14.2	9.8	11.3	11.3	19	0	16	16.8	0	19.8
		95th Queue		20	191		71	172		14	24		45	78	
	PM	LOS	B	A	B	B	B	B	B	C	A	B	C	A	C
		Delay	15.3	9.8	15.4	15.4	10.7	14.1	14.1	21.5	0	18.6	20.8	0	20.8
		95th Queue		39	266		62	233		22	65		62	76	

Table 71 - Analysis Summary of South Main Street & West Grattan Street Intersection

S Main St & W Grattan St/E Grattan St															
			Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Existing 2024	AM	LOS	A	B			B			A			A		
		Delay	0.7	12.1			14.3			8.0			8.4		
		95th Queue		0			4								
	PM	LOS	A	C			E			A			A		
		Delay	2.0	15.9			40.3			9.3			9.1		
		95th Queue		10			16			2					
No-Build 2027	AM	LOS	A	B			B			A			B		
		Delay	0.8	10.4			13.9			8.1			12.1		
		95th Queue		6			10			0			2		
	PM	LOS	A	C			F			A			C		
		Delay	2.5	15.1			79.5			9.4			15.1		
		95th Queue		12			22			2			2		
Build 2027	AM	LOS	A	B			C			A			B		
		Delay	0.7	11			19.1			8.3			12.6		
		95th Queue					6						4		
	PM	LOS	A	C			F			A			C		
		Delay	3	16.2			112.2			9.7			16.3		
		95th Queue					40						8		
Post Build 2033	AM	LOS	A	B			C			A			B		
		Delay	0.7	11.2			21.1			8.4			13.1		
		95th Queue					6						4		
	PM	LOS	A	C			F			A			C		
		Delay	3.6	16.7			144			9.8			16.8		
		95th Queue					48						6		

Table 82 - Analysis Summary of South Main Street & Paul Street Intersection

South Main & Paul St												
			Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Existing 2024	AM	LOS	A						B			
		Delay	0.2						10.1			
		95th Queue							2			
	PM	LOS	A						B			
		Delay	0.3						11			
		95th Queue							2			
No-Build 2027	AM	LOS	A						B			
		Delay	0.3						10.3			
		95th Queue							2			
	PM	LOS	A						B			
		Delay	0.4						11.2			
		95th Queue							2			
Build 2027	AM	LOS	A	B					B			
		Delay	0.8	13.9					10.5			
		95th Queue		2					2			
	PM	LOS	A	B					B			
		Delay	0.7	16.8					11.6			
		95th Queue		2					4			
Post Build 2033	AM	LOS	A	B					B			
		Delay	0.7	14					10.7			
		95th Queue		2					2			
	PM	LOS	A	C					B			
		Delay	0.7	17.5					12			
		95th Queue		2					6			

Table 93 - Analysis Summary of South Mason Street & Paul Street Intersection

South Mason & Paul St														
			Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Existing 2024	AM	LOS	A		B			A					A		
		Delay	2.1		10.3			9.9					7.3		
		95th Queue			2			2					0		
	PM	LOS	A		B			B		A			A		
		Delay	2.1		11.7			11.6		7.7			7.5		
		95th Queue			4			4		0			0		
No-Build 2027	AM	LOS	A		B			A					A		
		Delay	2.2		10.1			9.9					7.3		
		95th Queue			2			2					0		
	PM	LOS	A		B			B		A			A		
		Delay	2.1		11.8			11.7		7.7			7.5		
		95th Queue													
Build 2027	AM	LOS	A		B			A		A			A		
		Delay	2.4		10.2			10.1		7.6			7.3		
		95th Queue			2			2		2			2		
	PM	LOS	A		B			B		A			A		
		Delay	2.3		11.7			12.1		7.8			7.5		
		95th Queue			4			4		0			0		
Post Build 2033	AM	LOS	A		B			A		A			A		
		Delay	2.5		10.4			10.2		7.7			7.3		
		95th Queue													
	PM	LOS	A		B			B		A			A		
		Delay	2.4		12			12.4		7.8			7.6		
		95th Queue			4			4		0			0		

Table 104 – Analysis Summary of South Liberty Street & West Bruce Street Intersection

S Liberty St & W Bruce St								
			Intersection	EBT	EBR	SBL	SBT	SBR
Existing 2024	AM	LOS	B	A	C	B	A	B
		Delay	13.7	0.0	22.5	10.9	0.0	11.1
		95th Queue		70			77	
	PM	LOS	B	A	C	B	A	B
		Delay	14.5	0	23.2	12.3	0	12.6
		95th Queue		99			135	
No-Build 2027	AM	LOS	B	A	C	B		
		Delay	15.5	0	22.6	13.3		
		95th Queue		74			197	
	PM	LOS	B	A	C	B		
		Delay	19.3	0.0	23.3	18.3		
		95th Queue		102			399	
Build 2027	AM	LOS	B	A	C	B		
		Delay	15.7	0	22.9	13.4		
		95th Queue		75			202	
	PM	LOS	B	A	C	B		
		Delay	19.6	0	23.7	18.6		
		95th Queue		106			410	
Post Build 2033	AM	LOS	B	A	C	B		
		Delay	16	0	23.1	13.7		
		95th Queue		81			218	
	PM	LOS	B	A	C	B		
		Delay	20.8	0	23.9	20		
		95th Queue		114			454	

Table 115 - Analysis Summary of South Main Street & West Bruce Street Intersection

South Main & W Bruce St/E Bruce St								
			Intersection	EBL	EBT	NBL	NBT	NBR
Existing 2024	AM	LOS	B	B	A	A	B	B
		Delay	14.2	18.5	0.0	0.0	13.1	13.1
		95th Queue			41		82	
	PM	LOS	B	C	A	A	B	B
		Delay	19	30.3	0	0	14.4	14.4
		95th Queue			99		132	
No-Build 2027	AM	LOS	B	B	A	A	B	B
		Delay	14.3	18.6	0	0	13.2	13.2
		95th Queue			43		84	
	PM	LOS	B	C	A	A	B	B
		Delay	19.1	30.5	0.0	0.0	14.5	14.5
		95th Queue			m98		135	
Build 2027	AM	LOS	B	B	A	A	B	B
		Delay	14.4	18.6	0	0	13.4	13.4
		95th Queue			44		92	
	PM	LOS	B	C	A	A	B	B
		Delay	19.1	30.5	0	0	14.7	14.6
		95th Queue			m97		141	
Post Build 2033	AM	LOS	B	B	A	A	B	B
		Delay	14.5	18.6	0	0	13.5	13.5
		95th Queue			45		98	
	PM	LOS	B	C	A	A	B	B
		Delay	19.4	30.9	0	0	14.9	14.9
		95th Queue			m97		151	

Table 126 - Analysis Summary of South Main Street & Site Access Intersection

South Main Street & Site Access						
			Intersection	EBL	NBL	NBT
Build 2027	AM	LOS	A	B		
		Delay	0.7	12.4		
		95th Queue		4		
	PM	LOS	A	B		
		Delay	0.4	13.8		
		95th Queue		2		
Post Build 2033	AM	LOS	A	B		
		Delay	0.7	12.7		
		95th Queue		4		
	PM	LOS	A	B		
		Delay	0.4	14.1		
		95th Queue				

Table 137 - Analysis Summary of South Liberty Street & Site Access Intersection

South Liberty Street & Site Access						
			Intersection	WBL	SBL	SBT
Build 2027	AM	LOS	A	B		
		Delay	2.7	12.7		
		95th Queue		10		
	PM	LOS	A	B		
		Delay	1.7	15.7		
		95th Queue		14		
Post Build 2033	AM	LOS	A	B		
		Delay	2.7	13		
		95th Queue		14		
	PM	LOS	A	C		
		Delay	1.7	16.4		
		95th Queue		16		

Table 148 - Analysis Summary of South Liberty Street & Paul Street Intersection

South Liberty Street & Paul Street						
			Intersection	WBL	SBL	SBT
Build 2027	AM	LOS	A	B		
		Delay	0.4	12.3		
		95th Queue		2		
	PM	LOS	A	B		
		Delay	0.6	14.7		
		95th Queue		6		
Post Build 2033	AM	LOS	A	B		
		Delay	0.4	12.6		
		95th Queue		2		
	PM	LOS	A	B		
		Delay	0.7	15.5		
		95th Queue		8		

TECHNICAL APPENDICES

APPENDIX A

(Pre-Scope Form)

APPENDIX B

(Traffic Count Data)

APPENDIX C

(Synchro Output – Existing 2024 Conditions)

APPENDIX D

(Synchro Output – No-Build 2027 Conditions)

APPENDIX E

(Synchro Output – Build 2027 Conditions)

APPENDIX F

(Synchro Output – Post-Build 2033 Conditions)