A. INTRODUCTION

Following the guidance of the 2014 *City Environmental Quality Review (CEQR) Technical Manual*, this chapter considers the potential transportation impacts from the proposed project. As described in Chapter 1, "Project Description," the proposed project would result in the construction of a retail development at 534 South Avenue (Block 1707, Lots 1 and 5) in the Mariners Harbor area of Staten Island Community District 1. The approximately 28-acre project site is bounded by Forest Avenue and Wemple Street (which is not built) to the north, South Avenue to the east, Amador Street (which is mapped but not built) to the south, and Morrow Street (which is partially built and partially unbuilt) to the west. The proposed project would include approximately 226,000 gross square feet (gsf) of new retail uses, including approximately 92,000 gsf of wholesale warehouse space, 67,000 gsf of supermarket space, 16,000 gsf of restaurant space, 50,000 gsf of destination retail space, approximately 1,000 gsf of gas station and automated bank teller space, and 838 accessory parking spaces.

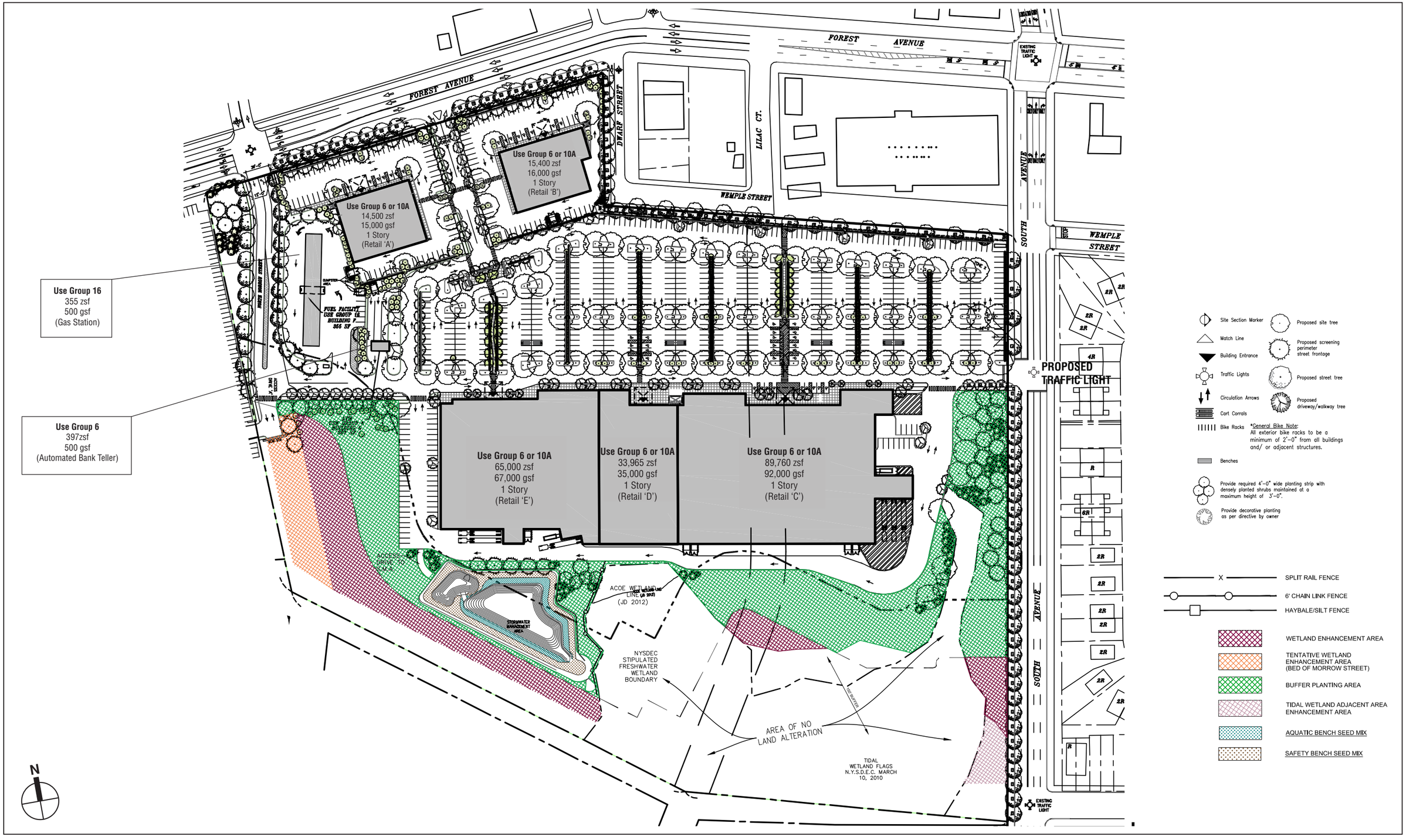
In the future No Action scenario, the project site could be redeveloped with approximately 228,000 gsf of Use Group (UG) 6 or 10A retail space, plus a gas station and automated bank teller. **Table 7-1** provides a comparison of the development program assumptions under the future No Action and With Action conditions.

Table 7-1
Future No Action and With Action Development Program Assumptions

Components	No Action	With Action	Increment
Destination Retail and Gas Station/Automated Bank Teller (gsf)	228,000*	51,000	-177,000
Wholesale Warehouse (gsf)	0	92,000	92,000
Supermarket (gsf)	0	67,000	67,000
Restaurant (gsf)	0	16,000	16,000
Total (gsf)	**228,000**	**226,000**	**-2,000**

Note:
*For trip generation purposes, the 228,000 gsf of retail development in the future No Action scenario was assumed to be destination retail.

Figure 7-1 provides an illustration of the site plan for the proposed project. The proposed project would have three vehicular access/egress locations: a signalized entrance/exit with all movements permitted on Forest Avenue; an unsignalized two-way, right-in/right-out only driveway on Forest Avenue; and a two-way driveway on South Avenue. The South Avenue driveway would be unsignalized with only right-in/right-out movements permitted in the No Action condition and signalized with all movements permitted in the With Action condition.



Notes: Building footprints, floor area, and Use Groups reflect the authorized site plan and are subject to CPC approval. Tenant use types and internal delineation are shown for illustrative RWCDS purposes. The UG 16 gas station and UG 6 automated bank teller shown on the plan are as-of-right. Gross square feet (gsf) numbers are approximate and based on a 3 percent adjustment to zoning square feet (zsf).

South Avenue Retail Development

Proposed Project Site Plan (With Action Scenario)
Figure 7-1

PRINCIPAL CONCLUSIONS

TRAFFIC

Traffic conditions were evaluated at 10 intersections for the weekday midday, PM, and Saturday peak hours. In the 2019 With Action condition, there would be the potential for significant adverse traffic impacts at four intersections in the weekday PM peak hour and at seven intersections in the Saturday peak hour. **Table 7-2** provides a summary of the impacted locations by lane group and analysis time period. Potential measures to mitigate the projected traffic impacts are described in Chapter 13, "Mitigation." It is anticipated that all or most of the identified significant adverse traffic impacts could be fully mitigated with the implementation of standard traffic mitigation measures (e.g., signal retiming or lane restriping).

Table 7-2
Summary of Significant Adverse Traffic Impacts
Proposed Project

Intersection		Weekday PM Peak Hour	Saturday Peak Hour
EB/WB Street	**NB/SB Street**		
Forest Avenue	Maple Parkway		WB-L
Forest Avenue	Richmond Avenue/Morningstar Road	EB-TR	EB-L EB-TR
Forest Avenue	Union Avenue	WB-L	WB-L
Forest Avenue	Willow Road West		EB-TR
South Avenue	Amador Street		NB-TR
South Avenue	Lisk Avenue	WB-LR	WB-LR
South Avenue	Goethals Road North	WB-LTR	WB-LTR
Total Impacted Intersections/Lane Groups		**4/4**	**7/8**

Notes:
L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn, EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound.

TRANSIT

The total net incremental trips estimated for the future with the proposed project would be 1, 6, and 10 person trips by bus during the weekday midday, PM, and Saturday peak hours, respectively. Since these incremental bus trips do not exceed the *CEQR Technical Manual* analysis threshold of 50 or more peak hour bus riders on a bus route in a single direction, a detailed bus line-haul analysis is not warranted and the proposed project is not expected to result in any significant adverse bus line-haul impacts.

PEDESTRIAN

In the With Action condition, all auto trips are expected to park on site, and all taxi trips would be dropped off and picked up within the Project Site, adjacent to store entrances. Person trips associated with autos and taxis would therefore not traverse the pedestrian elements surrounding the Project Site. The remaining pedestrian walk trips would be below the *CEQR Technical Manual* threshold of 200 peak hour pedestrian trips and are not expected to result in any significant adverse pedestrian impacts.

VEHICULAR AND PEDESTRIAN SAFETY

During the August 1, 2013, and July 31, 2016 three-year period, a total of 210 reportable and non-reportable crashes, zero fatalities, 224 injuries, and 35 pedestrian/bicyclist-related crashes occurred at the study area intersections. A rolling total of crash data identifies zero high crash locations in the 2013 to 2016 period. Therefore, the proposed project would not result in the potential for any significant adverse pedestrian safety impacts.

PARKING

The proposed project would include 838 parking spaces on the project site. Accounting for the incremental parking supply and demand generated by the proposed project, the With Action parking utilization is expected to reach a maximum of 71 percent of the on-site parking capacity during the Saturday peak hour. Therefore, the proposed project would not result in the potential for a parking shortfall or significant adverse parking impacts.

B. PRELIMINARY ANALYSIS METHODOLOGY AND SCREENING ASSESSMENT

The *CEQR Technical Manual* recommends a two-tier screening procedure for the preparation of a "preliminary analysis" to determine if quantified analyses of transportation conditions are warranted. As discussed below, the preliminary analysis begins with a trip generation analysis (Level 1) to estimate the volume of person and vehicle trips attributable to the proposed project. If the proposed project is expected to result in fewer than 50 peak hour vehicle trips and fewer than 200 peak hour transit or pedestrian trips, further quantified analyses are not warranted. When these thresholds are exceeded, detailed trip assignments (Level 2) are performed to estimate the incremental trips at specific transportation elements and to identify potential locations for further analyses. If the trip assignments show that the proposed project would result in 50 or more peak hour vehicle trips at an intersection, 200 or more peak hour subway trips at a station, 50 or more peak hour bus trips in one direction along a bus route, or 200 or more peak hour pedestrian trips traversing a pedestrian element, then further quantified analyses may be warranted to assess the potential for significant adverse impacts on traffic, transit, pedestrians, parking, and vehicular and pedestrian safety.

LEVEL 1 SCREENING ASSESSMENT

A Level 1 trip generation screening assessment was conducted to estimate the numbers of person and vehicle trips by mode expected to be generated by the proposed project during the weekday midday, PM, and Saturday peak hours. These estimates were then compared to the *CEQR Technical Manual* thresholds to determine if a Level 2 screening and/or quantified operational analyses would be warranted.

TRANSPORTATION PLANNING ASSUMPTIONS

Trip generation factors for the proposed project were reviewed and approved by the New York City Department of City Planning (NYCDCP) in a Travel Demand Factors Memorandum (see **Appendix D**). These factors were developed based on information from the 2014 *CEQR Technical Manual*, the 2011 *Brooklyn Bay Center FEIS*, the 2009 *Gateway Estates II FEIS*, and the 2013 *St. George Waterfront Redevelopment FEIS*, as summarized in **Table 7-3**.

Wholesale Warehouse

The daily person trip rate, temporal distribution, vehicle occupancies, and modal splits for the wholesale warehouse component are from the 2011 *Brooklyn Bay Center FEIS.* The directional distributions are based on the 2011 *Brooklyn Bay Center FEIS* and the 2009 *Gateway Estates II FEIS.* The daily delivery trip rate and temporal and directional distributions are from the 2014 *CEQR Technical Manual* and the 2011 *Brooklyn Bay Center FEIS*.

Table 7-3
Travel Demand Assumptions

Use	Wholesale Warehouse			Destination Retail			Supermarket			Quality Restaurant		
Total Daily/Peak Hour Person Trip Rates	(3) **Weekday** **5.03**	**4.89**	Saturday 11.38 Trips/KSF	(1) Weekday 78.2		Saturday 92.5 Trips/KSF	(1) Weekday 175.0		Saturday 231.0 Trips/KSF	(4) Weekday 173.0		Saturday 181.0 Trips/KSF
Trip Linkage	**0%**		0%	0%		0%	25%		25%	0%		0%
Net Daily/Peak Hour Person Trip Rates	**Weekday** **5.03**	**4.89**	Saturday 11.38 Trips/KSF	Weekday 78.2		Saturday 92.5 Trips/KSF	Weekday 131.25		Saturday 173.25 Trips/KSF	Weekday 173.0		Saturday 181.0 Trips/KSF
	MD	**PM**	**Sat**	**MD**	**PM**	**Sat**	**MD**	**PM**	**Sat**	**MD**	**PM**	**Sat**
Temporal Dist.	(3)			(1)			(1)			(4)		
	100%	100%	100%	9%	9%	11%	6%	10%	9%	8.7%	10.4%	6.0%
Directional Dist.	(2)(3)			(2)(3)			(2)(3)			(4)		
In	53.6%	51.8%	53.6%	53.6%	51.8%	53.6%	53.6%	51.8%	53.6%	50%	50%	50%
Out	46.4%	48.2%	46.4%	46.4%	48.2%	46.4%	46.4%	48.2%	46.4%	50%	50%	50%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Modal Split	(3)			(3)			(3)			(3)		
	MD	PM	Sat	MD	PM	Sat	MD	PM	Sat	MD	PM	Sat
Auto	95.0%	95.0%	93.0%	95.0%	95.0%	93.0%	95.0%	95.0%	93.0%	95.0%	95.0%	93.0%
Taxi	3.0%	3.0%	5.0%	3.0%	3.0%	5.0%	3.0%	3.0%	5.0%	3.0%	3.0%	5.0%
Bus	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Vehicle Occupancy	(3)			(3)			(3)			(4)		
	Weekday		Saturday	Weekday		Saturday	Weekday		Saturday	Weekday		Saturday
Auto	1.40		1.72	1.40		1.72	1.40		1.72	2.00		2.00
Taxi	1.64		1.75	1.64		1.75	1.64		1.75	2.00		2.00
Daily Delivery Trip Rate	(1)(3) Weekday 0.35 Delivery Trips/KSF		Saturday 0.04 Delivery Trips/KSF	(1) Weekday 0.35 Delivery Trips/KSF		Saturday 0.04 Delivery Trips/KSF	(1) Weekday 0.35 Delivery Trips/KSF		Saturday 0.04 Delivery Trips/KSF	(4) Weekday 0.68 Delivery Trips/KSF		Saturday 0.03 Delivery Trips/KSF
	MD	**PM**	**Sat**	**MD**	**PM**	**Sat**	**MD**	**PM**	**Sat**	**MD**	**PM**	**Sat**
Delivery Temporal	(1)			(1)			(1)			(4)		
	11%	2%	11%	11%	2%	11%	11%	2%	11%	7.6%	1.0%	7.6%
Delivery Directional	(1)			(1)			(1)			(4)		
In	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Out	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note:
The wholesale warehouse trip rates correspond with trip-making for the specific peak hours.
Sources:
[1] 2014 *CEQR Technical Manual.*
[2] Gateway Estates II FEIS (2009).
[3] Brooklyn Bay Center FEIS (2011).
[4] St. George Waterfront Redevelopment FEIS (2013).

Destination Retail

The daily person trip rate and temporal distribution for the destination retail component are from the 2014 *CEQR Technical Manual*. The directional distributions are based on the 2011 *Brooklyn Bay Center FEIS* and the 2009 *Gateway Estates II FEIS*. The vehicle occupancies and modal splits are from the 2011 *Brooklyn Bay Center FEIS*. The daily delivery trip rate, temporal distribution, and directional distribution are from the 2014 *CEQR Technical Manual*.

Supermarket

The daily trip generation rate for the supermarket component is from the 2014 *CEQR Technical Manual*. Consistent with typically accepted assumptions for purposes of environmental review under CEQR and taking into consideration the other adjacent uses in this retail development, a 25-percent linked trip credit was applied to the supermarket trip generation estimates. The modal

splits and vehicle occupancies were obtained from the 2011 *Brooklyn Bay Center FEIS*. The temporal and directional distributions were obtained from the 2014 *CEQR Technical Manual* and the 2011 *Brooklyn Bay Center/*2009 *Gateway Estates II FEIS*, respectively. The daily delivery trip rate and temporal and directional distributions are from the 2014 *CEQR Technical Manual*.

Quality Restaurant

The daily trip generation rate for the quality restaurant component is from the 2013 *St. George Waterfront Redevelopment FEIS*. The modal splits were obtained from the 2011 *Brooklyn Bay Center FEIS* and the 2009 *Gateway Estates II FEIS*. The temporal and directional distributions, vehicle occupancies, and the daily delivery trip rate and temporal and directional distributions were obtained from the 2013 *St. George Waterfront Redevelopment FEIS.*

TRAVEL DEMAND PROJECTION SUMMARY

As summarized in **Table 7-4**, the No Action development is estimated to generate approximately 1,599, 1,599, and 2,312 person trips during the weekday midday, PM, and Saturday peak hours, respectively. Approximately 1,151, 1,145, and 1,382 vehicle trips would be generated during the same respective peak hours.

Table 7-4
Trip Generation Summary: Future No Action Condition

Person Trips						Vehicle Trips				
Peak Hour	**In/Out**	**Auto**	**Taxi**	**Bus**	**Total**	**In/Out**	**Auto**	**Taxi**	**Delivery**	**Total**
Midday	In	814	26	17	857	In	581	29	4	614
	Out	705	22	15	742	Out	504	29	4	537
	Total	1,519	48	32	1,599	Total	1,085	58	8	1,151
PM	In	787	25	16	828	In	562	29	1	592
	Out	732	23	16	771	Out	523	29	1	553
	Total	1,519	48	32	1,599	Total	1,085	58	2	1,145
Saturday	In	1,152	62	25	1,239	In	670	66	0	736
	Out	998	54	21	1,073	Out	580	66	0	646
	Total	2,150	116	46	2,312	Total	1,250	132	0	1,382

As summarized in **Table 7-5,** the With Action development is estimated to generate approximately 1,583, 1,971, and 2,775 person trips during the weekday midday, PM, and Saturday peak hours, respectively. Approximately 1,088, 1,349, and 1,645 vehicle trips would be generated during the same respective time periods.

Table 7-5
Trip Generation Summary: Future With Action Condition

Person Trips						Vehicle Trips				
Peak Hour	**In/Out**	**Auto**	**Taxi**	**Bus**	**Total**	**In/Out**	**Auto**	**Taxi**	**Delivery**	**Total**
Midday	In	798	25	17	840	In	546	27	4	577
	Out	706	21	16	743	Out	480	27	4	511
	Total	1,504	46	33	1,583	Total	1,026	54	8	1,088
PM	In	965	31	20	1,016	In	660	35	0	695
	Out	907	30	18	955	Out	619	35	0	654
	Total	1,872	61	38	1,971	Total	1,279	70	0	1,349
Saturday	In	1,378	74	29	1,481	In	794	79	0	873
	Out	1,203	64	27	1,294	Out	693	79	0	772
	Total	2,581	138	56	2,775	Total	1,487	158	0	1,645

As summarized in **Table 7-6,** the net incremental trips subject to CEQR impact analyses would therefore be -16, 372, and 463 person trips and -63, 204, and 263 vehicle trips during the weekday midday, PM, and Saturday peak hours, respectively.

Table 7-6
Trip Generation Summary: Net Incremental Trips

Person Trips						Vehicle Trips				
Peak Hour	**In/Out**	**Auto**	**Taxi**	**Bus**	**Total**	**In/Out**	**Auto**	**Taxi**	**Delivery**	**Total**
Midday	In	-16	-1	0	-17	In	-35	-2	0	-37
	Out	1	-1	1	1	Out	-24	-2	0	-26
	Total	-15	-2	1	-16	Total	-59	-4	0	-63
PM	In	178	6	4	188	In	98	6	-1	103
	Out	175	7	2	184	Out	96	6	-1	101
	Total	353	13	6	372	Total	194	12	-2	204
Saturday	In	226	12	4	242	In	124	13	0	137
	Out	205	10	6	221	Out	113	13	0	126
	Total	431	22	10	463	Total	237	26	0	263

Traffic

As shown in **Table 7-6**, the net incremental trips estimated for the future with the proposed project would be -63, 204, and 263 vehicle trips during the weekday midday, PM, and Saturday peak hours, respectively. As described above, site access and circulation would differ between the No Action and With Action conditions. Therefore, even though the number of net incremental vehicle trips for the weekday midday peak hour is estimated to be less than zero, a Level 2 screening assessment was conducted for all three analysis peak hours.

Transit

As detailed in **Table 7-6**, the net incremental trips estimated for the future with the proposed project would be 1, 6, and 10 person trips by bus during the weekday midday, PM, and Saturday peak hours, respectively. Since these incremental bus trips do not exceed the *CEQR Technical Manual* analysis threshold of 50 or more peak hour bus riders on a bus route in a single direction, a detailed bus line-haul analysis is not warranted and the proposed project is not expected to result in any significant adverse bus line-haul impacts.

Pedestrians

As detailed in **Table 7-6**, the net incremental trips estimated for the future with the proposed project would be -16, 372, and 463 person trips during the weekday midday, PM, and Saturday peak hours, respectively. All of the auto trips would park on-site and would not traverse any pedestrian elements (i.e., sidewalks, corners, and crosswalks) surrounding the development site. Patrons accessing the project site via taxi would also be expected to get picked up/dropped off on-site. As a result, only the incremental bus trips would traverse the surrounding pedestrian elements. Since these incremental bus trips do not exceed the *CEQR Technical Manual* analysis threshold of 200 or more peak hour pedestrian trips, a detailed pedestrian analysis is not warranted and the proposed project is not expected to result in any significant adverse pedestrian impacts.

LEVEL 2 SCREENING ASSESSMENT

A Level 2 screening assessment involves the distribution and assignment of projected trips to the transportation network and the determination of whether specific locations are expected to

experience incremental trips exceeding *CEQR Technical Manual* thresholds. Typically, if the results of this analysis show that the proposed project would result in 50 or more peak hour vehicle trips through an intersection, 50 or more peak hour bus riders on a bus route in a single direction, 200 or more peak hour subway passengers per station, or 200 or more peak hour pedestrian trips per pedestrian element, further quantified analyses may be warranted to evaluate the potential for significant adverse traffic, transit, pedestrian, and parking impacts.

SITE ACCESS AND CIRCULATION

Currently, an unsignalized entrance roadway at the northwest corner of the development site provides access to the adjacent movie theater complex, which has an existing curb cut on the open and built portion of Morrow Street. The proposed project would enlarge and realign Morrow Street so that it would utilize the existing traffic signal located at the easterly curb cut for the Home Depot site on the northern side of Forest Avenue (see **Figure 7-1**). Primary access to the development site from Forest Avenue would be provided by this re-aligned roadway, which would continue to provide access to the movie theater located on the west side of Morrow Street (the portion of Morrow Street south of the entrance to the movie theater is proposed for de-mapping). Two-way, right-in/right-out only access/egress from Forest Avenue would also be provided from a proposed curb cut to the east of the main entrance, which would not be signalized. A third vehicular entrance would provide two-way access/egress from South Avenue along the eastern boundary of the development site. The South Avenue driveway would be unsignalized with only right-in/right-out movements permitted in the No Action condition and signalized with all movements permitted in the With Action condition. In addition to the mapping actions to facilitate the realignment of Morrow Street, portions of Garrick Street, Amador Street, Albany Avenue, and Wemple Street (unbuilt streets) would be demapped.

The site plan has been given conditional approval by the New York State Department of Environmental Conservation (NYSDEC) that stipulates that the wetland area on the southern portion of the project site would be preserved both the No Action and With Action scenarios. The No Action development and the proposed project would also provide a landscaped buffer between the retail center and the preserved wetland area.

TRAFFIC

The projected vehicle trips for the three peak hours under the No Action and With Action conditions were assigned to area intersections based on likely travel routes to and from the development site, prevailing travel patterns, population density of the surrounding neighborhoods, configuration of the roadway network, and the anticipated locations of site access and egress. Auto trips were assigned to the accessory parking lot and taxi trips were assigned to the various storefronts located within the project site. All delivery trips were assigned to the development site via New York City Department of Transportation (NYCDOT) designated truck routes. Traffic assignments for autos, taxis, and deliveries for the various development uses are further discussed below.

Traffic Assignments

The destination retail, wholesale warehouse, supermarket, and quality restaurant components of the proposed project are expected to draw patrons primarily from Staten Island, within 2-3 miles of the project site. Therefore, auto trips were generally assigned from local origins within the neighborhood and adjacent residential areas. Overall, the vehicle trips generated by the proposed project were distributed to the study area roadway network in the following manner:

approximately 45 percent assigned to points east and northeast of the development via Forest Avenue, 30 percent to points southeast and northeast via South Avenue, 20 percent via I-278, and 5 percent via the West Shore Expressway.

Taxis

Taxi pick-ups and drop-offs for all project components were assigned to the various storefronts located within the project site.

Deliveries

Truck delivery trips for all project components were assigned to NYCDOT-designated truck routes. The roadways used by trucks to access the project site, which includes Forest Avenue, South Avenue, Willow Road West, and Glen Street, are all designated truck routes.

Summary

The No Action project generated vehicle trips are shown in **Figures 7-2 through 7-4**, and the With Action project generated vehicle trips are shown in **Figures 7-5 through 7-7.** The net incremental vehicle trips are shown in **Figures 7-8 through 7-10** and summarized in **Table 7-7**. The negative increments at the site access intersections along Forest Avenue and at the Forest Avenue and South Avenue intersection are results of the full access/egress facilitated by the proposed signalized South Avenue driveway under the With Action condition. East of South Avenue, in consultation with the lead agency and NYCDOT, ten intersections were selected for inclusion in the study area shown in **Figure 7-11**.

Table 7-7

Traffic Level 2 Screening Analysis Results—Selected Analysis Locations

Intersection	Incremental Vehicle Trips			Selected Analysis Locations
	Weekday Midday	Weekday PM	Saturday	
Forest Avenue and Goethals Road North	-139	-119	-146	
Forest Avenue and Morrow Street (West of Home Depot West Driveway)	-139	-120	-146	
Forest Avenue and Home Depot West Driveway	-139	-120	-146	
Forest Avenue and Morrow Street (Realigned Project Driveway)	-402	-338	-411	
Forest Avenue and Project Driveway (Unsignalized)	-317	-215	-261	
Forest Avenue and South Avenue	-218	-85	-101	
Forest Avenue and Grandview Avenue	-19	**68**	**87**	✓
Forest Avenue and Lowe's Driveway	-17	**64**	**81**	
Forest Avenue and Harbor Road	-17	**64**	**81**	
Forest Avenue and Union Avenue	-16	**63**	**77**	✓
Forest Avenue and Maple Parkway	-16	**60**	**73**	✓
Forest Avenue and Van Pelt Avenue	-16	**58**	**70**	
Forest Avenue and Van Name Avenue	-15	**56**	**67**	
Forest Avenue and Simonson Avenue	-15	**54**	**66**	
Forest Avenue and Lake Avenue/Eunice Place	-14	**53**	**63**	✓
Forest Avenue and Morningstar Road	-14	**50**	**61**	✓
Forest Avenue and Willow Road West	-17	**57**	**70**	✓
Forest Avenue and Willow Road East	-13	43	**53**	
South Avenue and Brabant Street	-9	31	38	
South Avenue and Wemple Street	-135	-90	-114	
South Avenue and Project Driveway	**159**	**317**	**396**	✓
South Avenue and Amador Street	**104**	**224**	**282**	✓
South Avenue and Lisk Avenue	**109**	**212**	**267**	✓
South Avenue and Goethals Road North	-26	**84**	**108**	✓
South Avenue and Glen Street/Fahy Avenue	-10	37	45	
Lamberts Lane and Fahy Avenue	-6	26	32	
Richmond Avenue and Goethals Road North	-4	12	16	
Richmond Avenue and Deppe Place	-2	4	7	

Note:
✓ denotes intersections selected for detailed traffic analysis.

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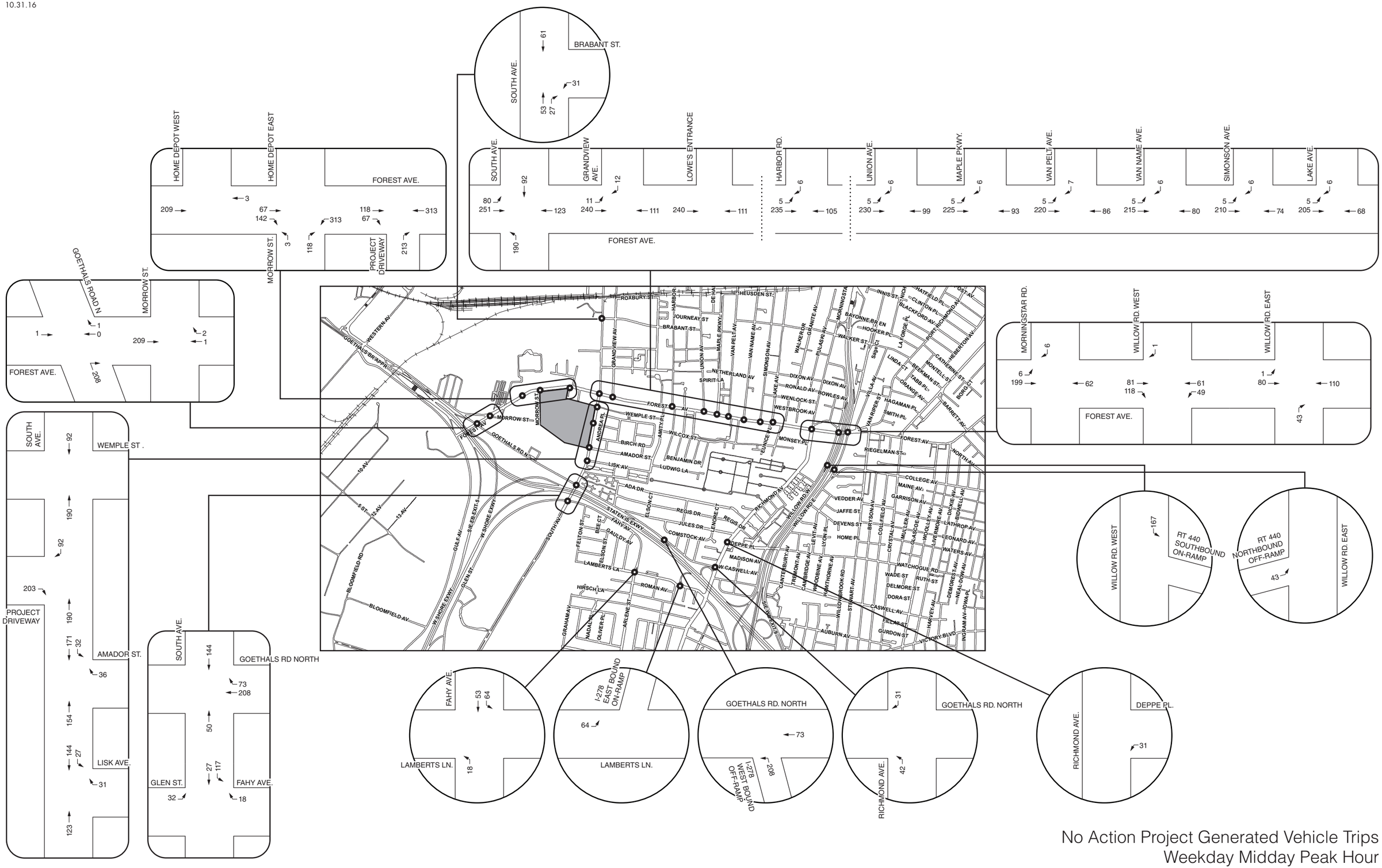

No Action Project Generated Vehicle Trips
Weekday Midday Peak Hour

Figure 7-2

South Avenue Retail Development

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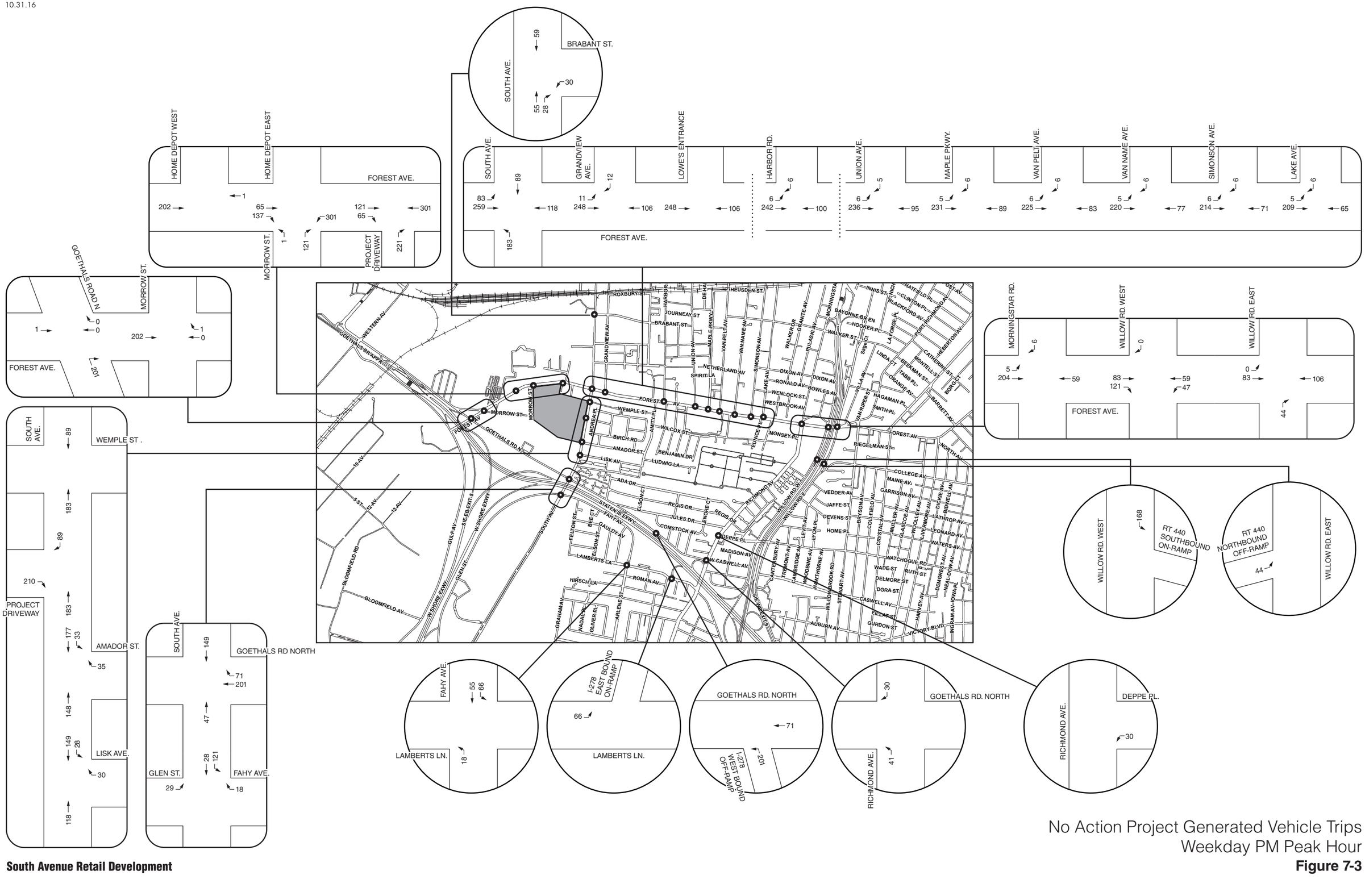

South Avenue Retail Development

No Action Project Generated Vehicle Trips
Weekday PM Peak Hour

Figure 7-3

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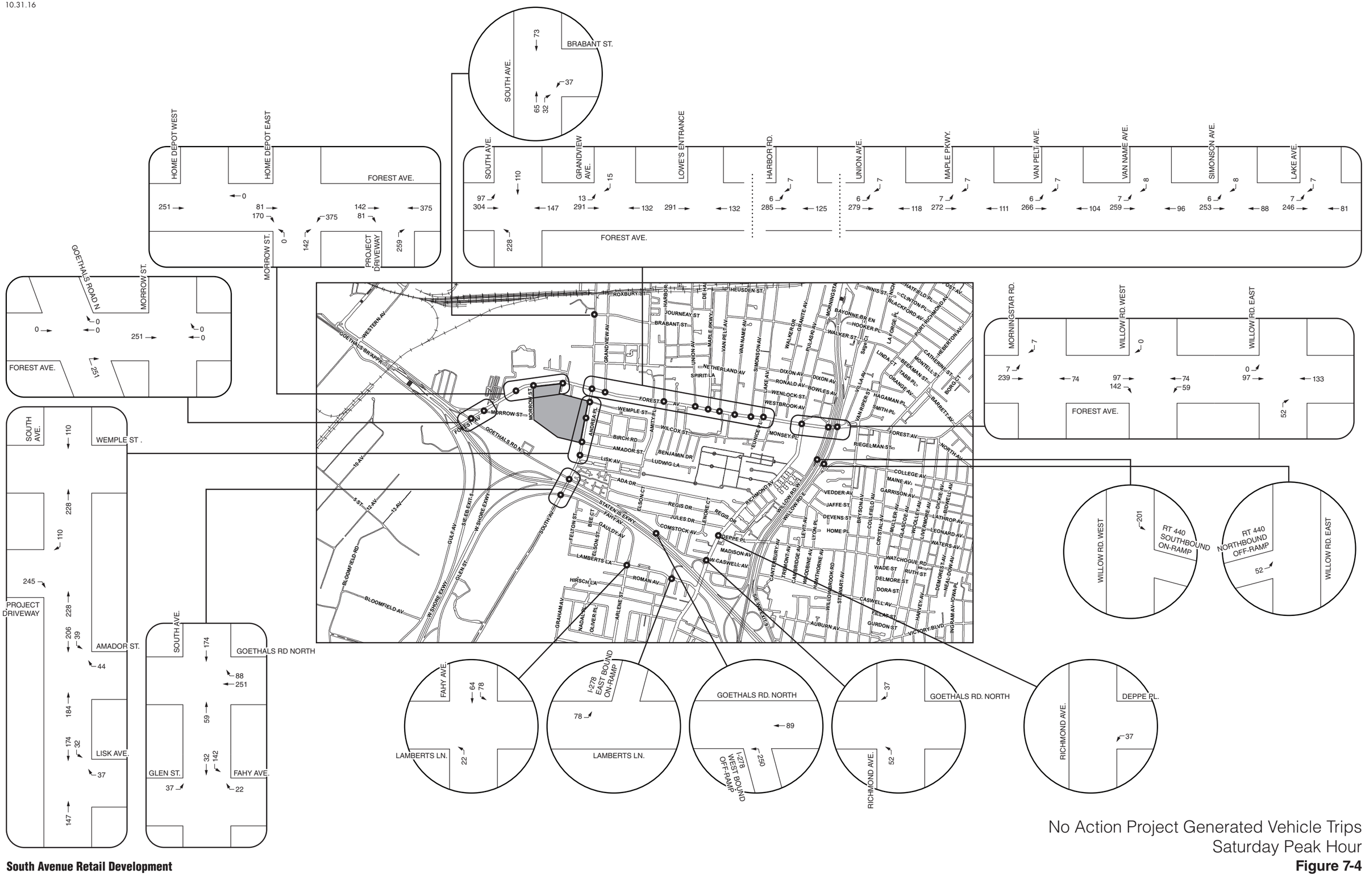

No Action Project Generated Vehicle Trips
Saturday Peak Hour
Figure 7-4

South Avenue Retail Development

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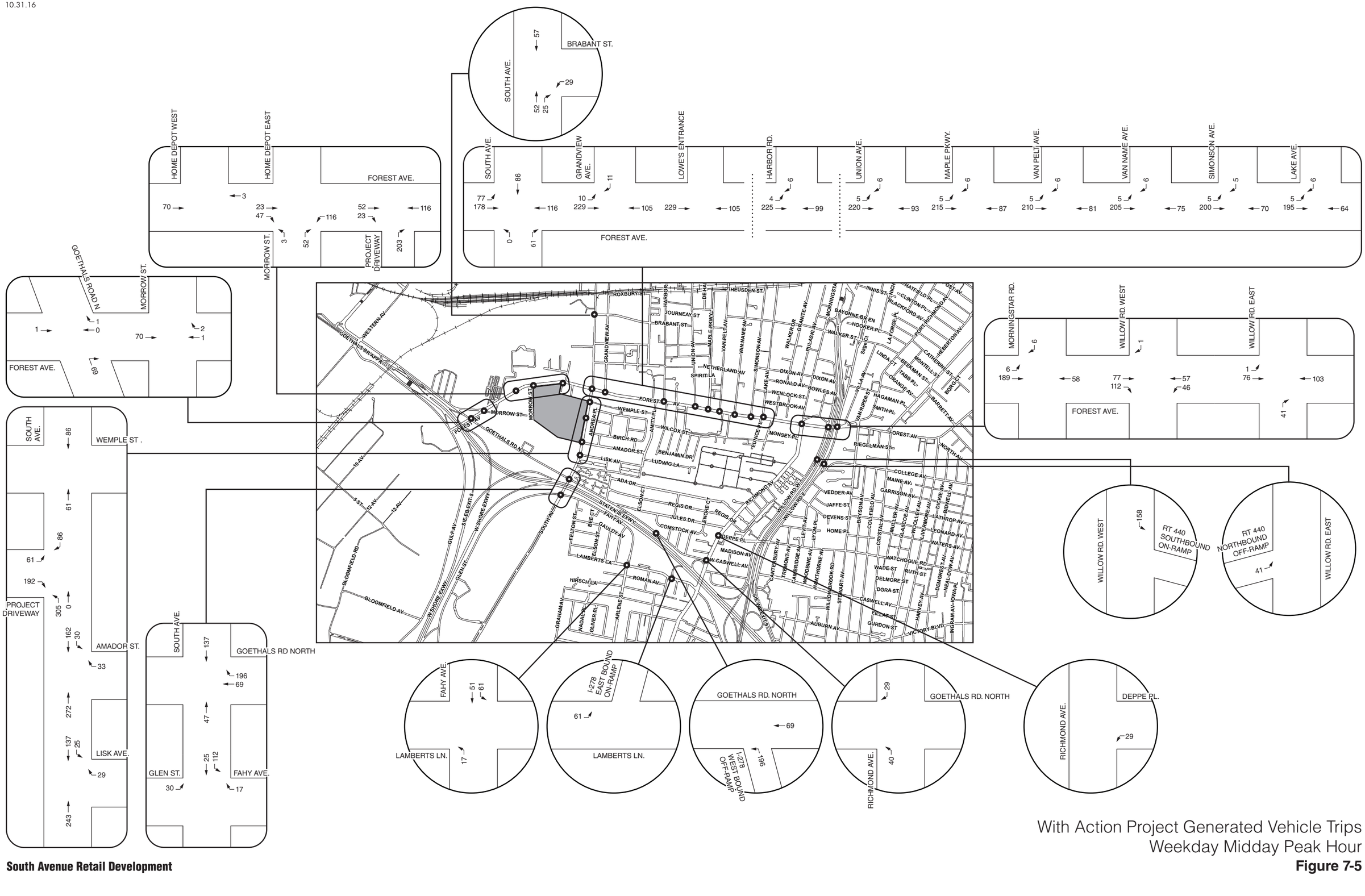

With Action Project Generated Vehicle Trips
Weekday Midday Peak Hour

Figure 7-5

South Avenue Retail Development

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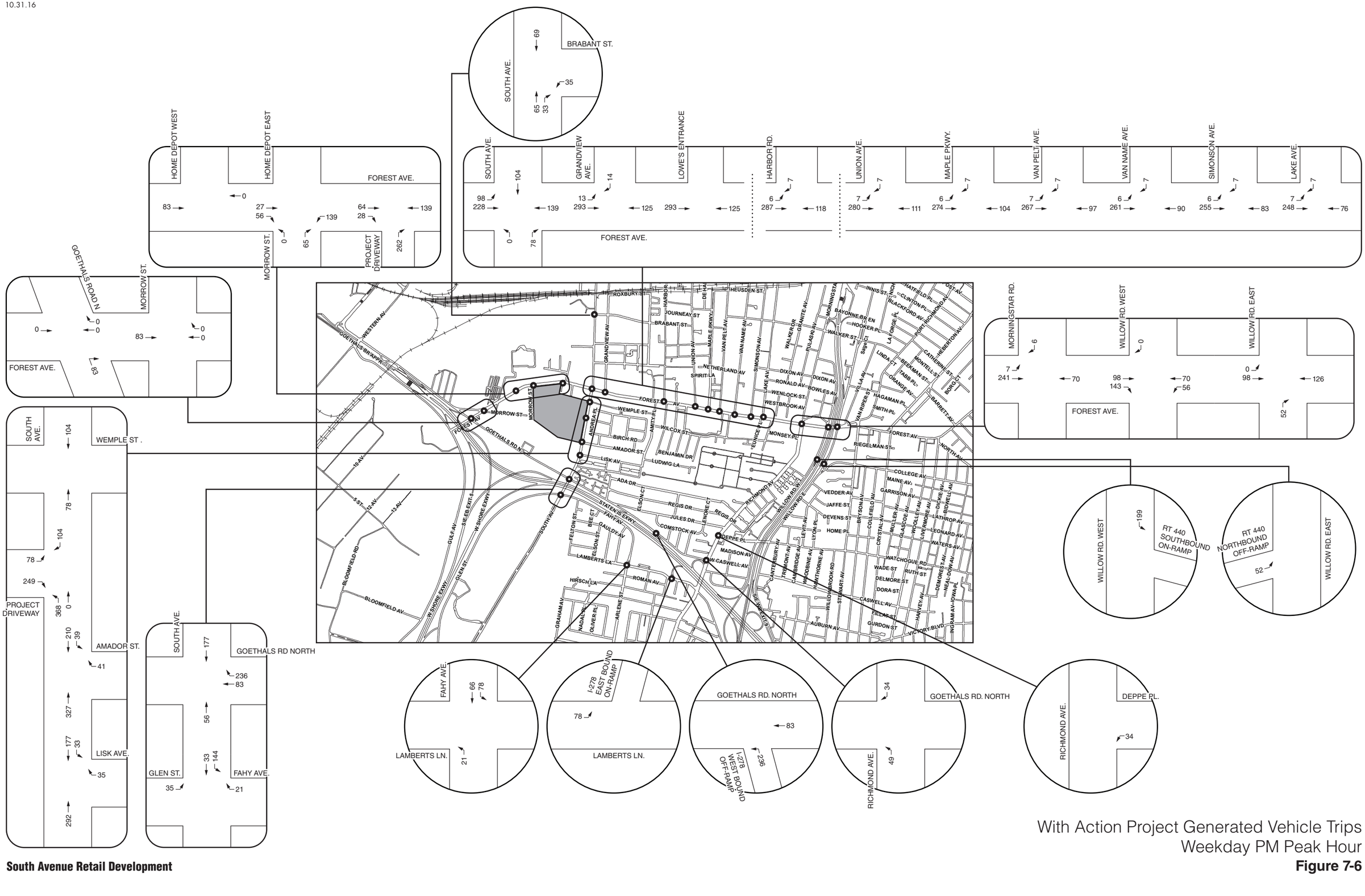
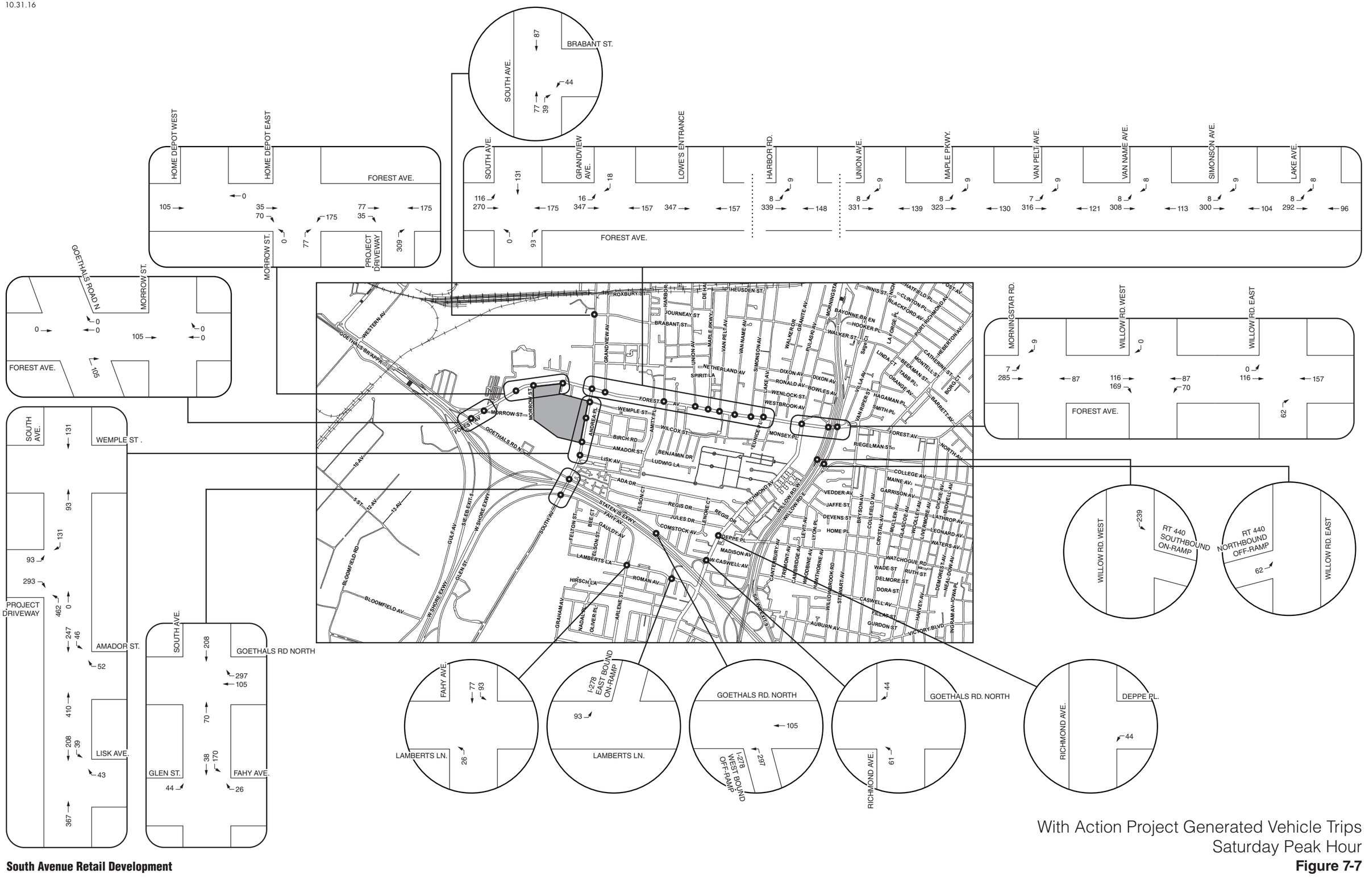


South Avenue Retail Development

With Action Project Generated Vehicle Trips
Weekday PM Peak Hour

Figure 7-6

10.31.16

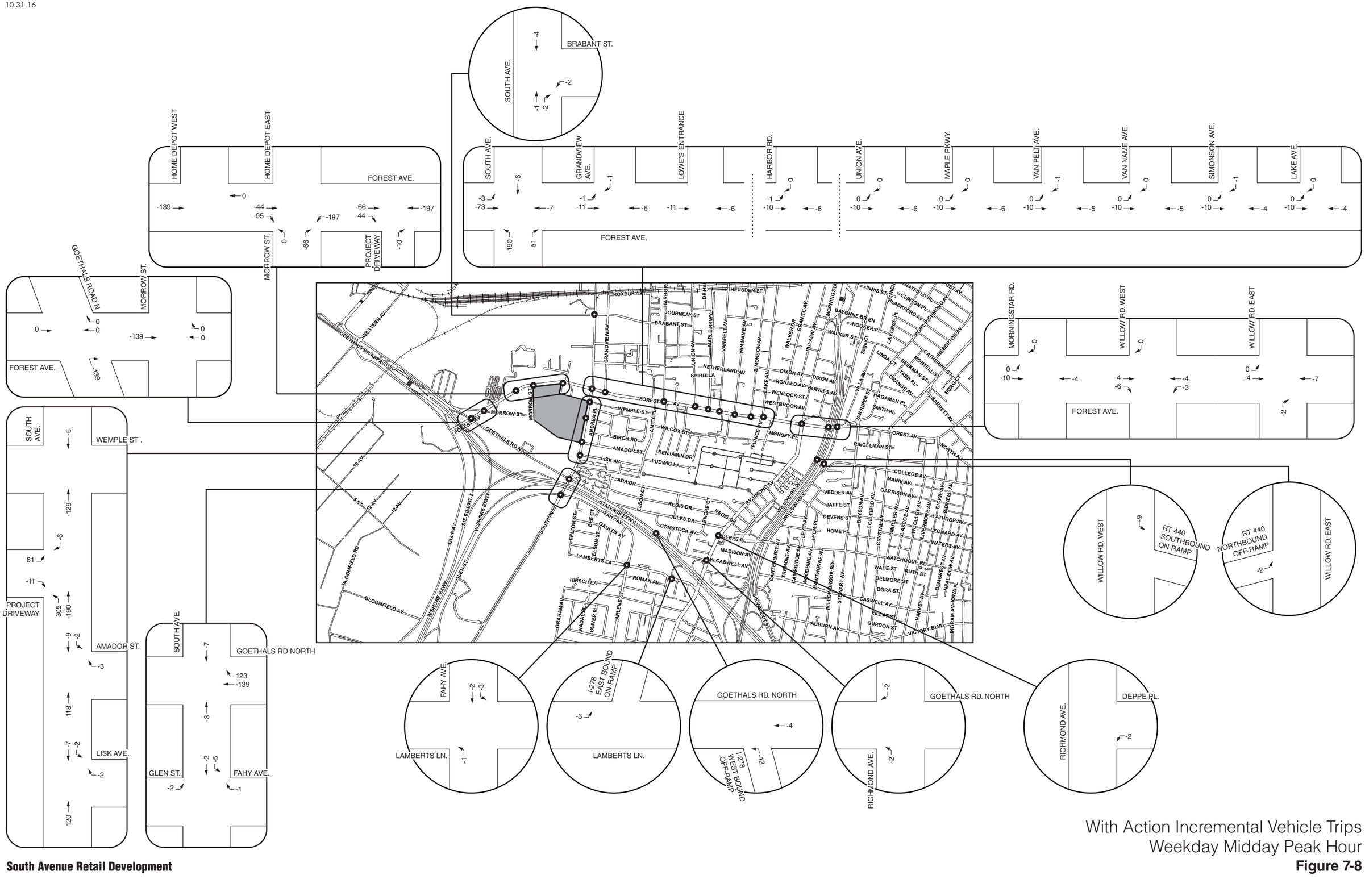


With Action Project Generated Vehicle Trips
Saturday Peak Hour

Figure 7-7

South Avenue Retail Development

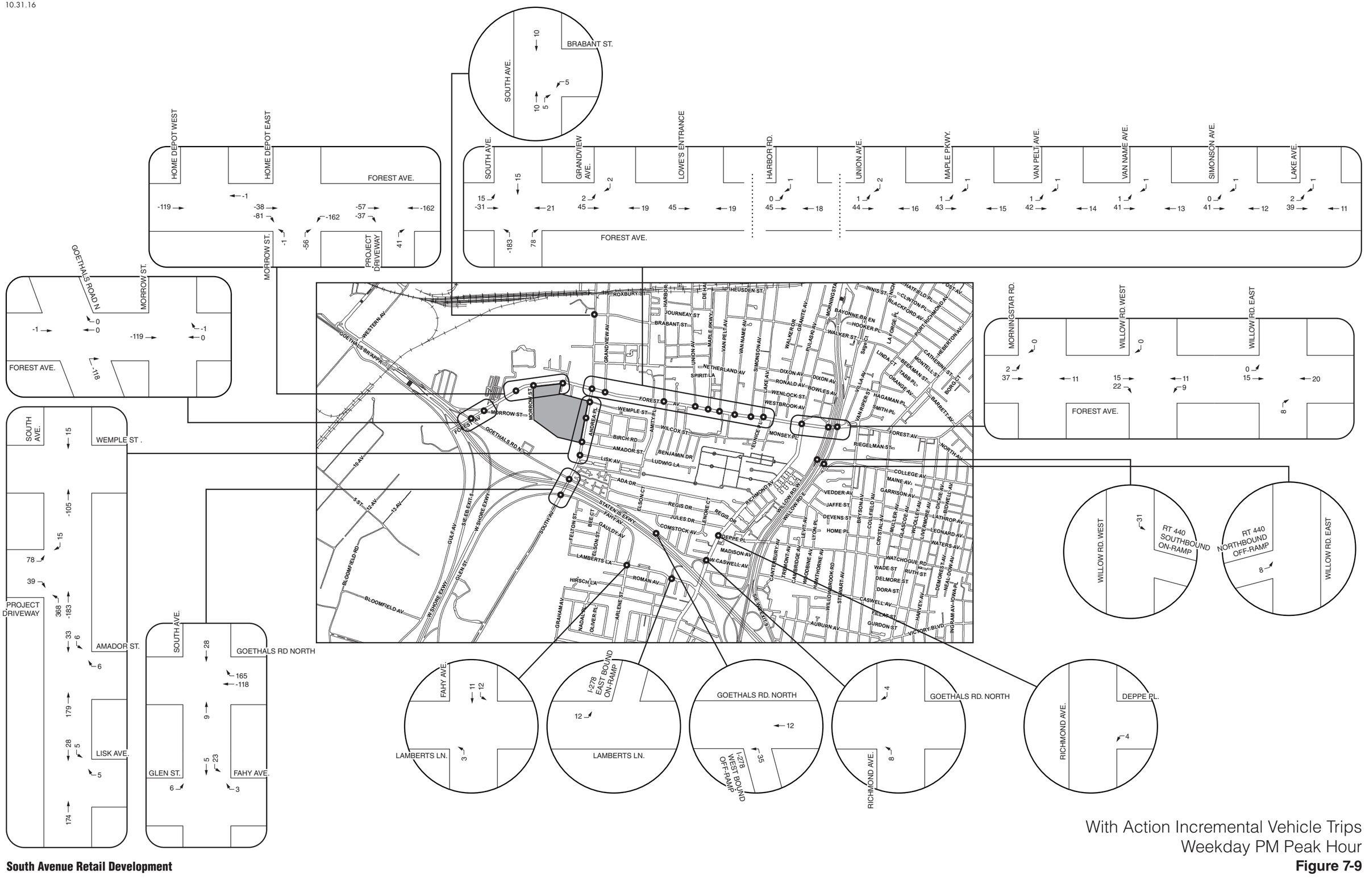
10.31.16



South Avenue Retail Development

With Action Incremental Vehicle Trips
Weekday Midday Peak Hour
Figure 7-8

10.31.16

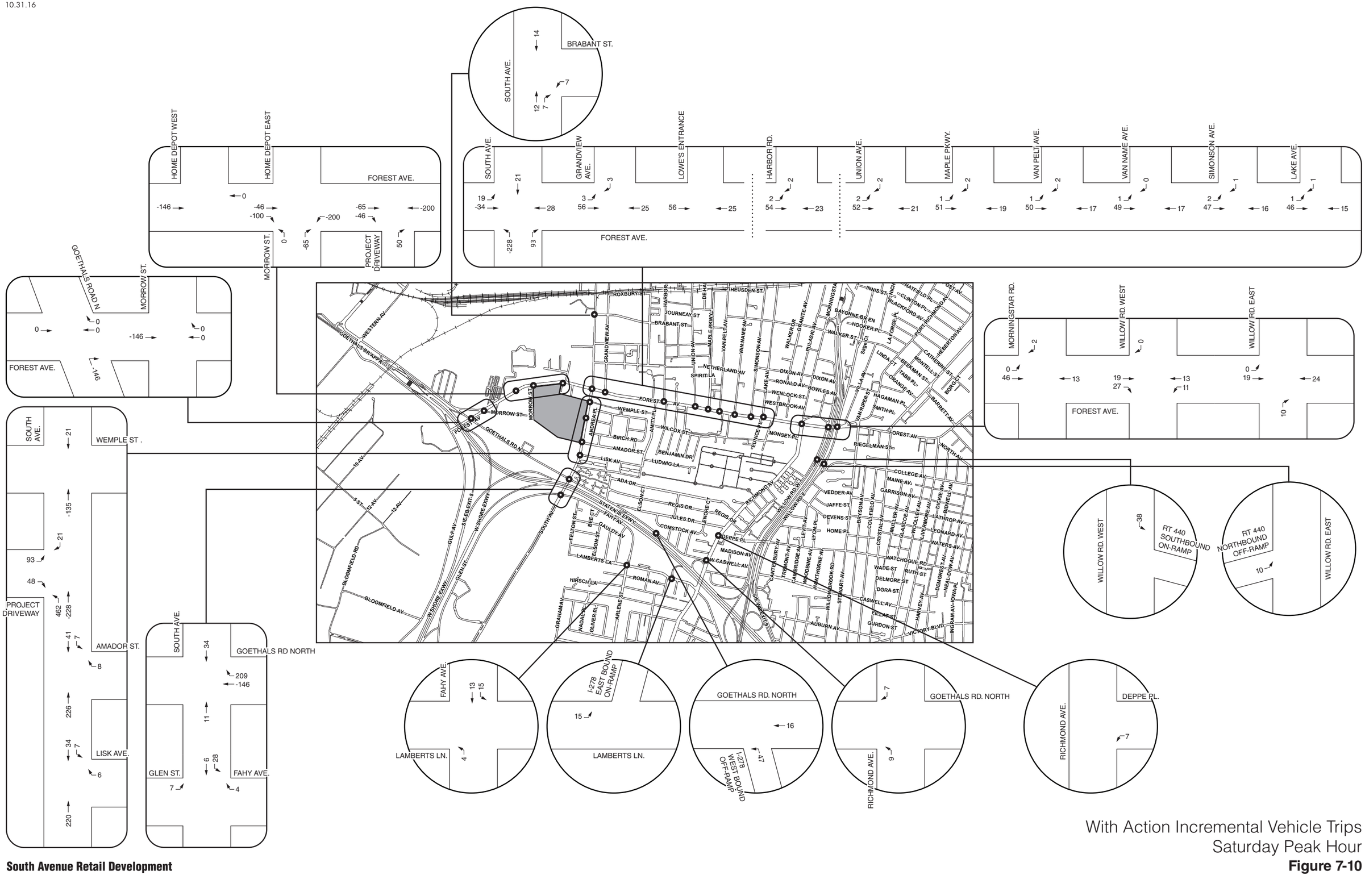


With Action Incremental Vehicle Trips
Weekday PM Peak Hour

Figure 7-9

South Avenue Retail Development

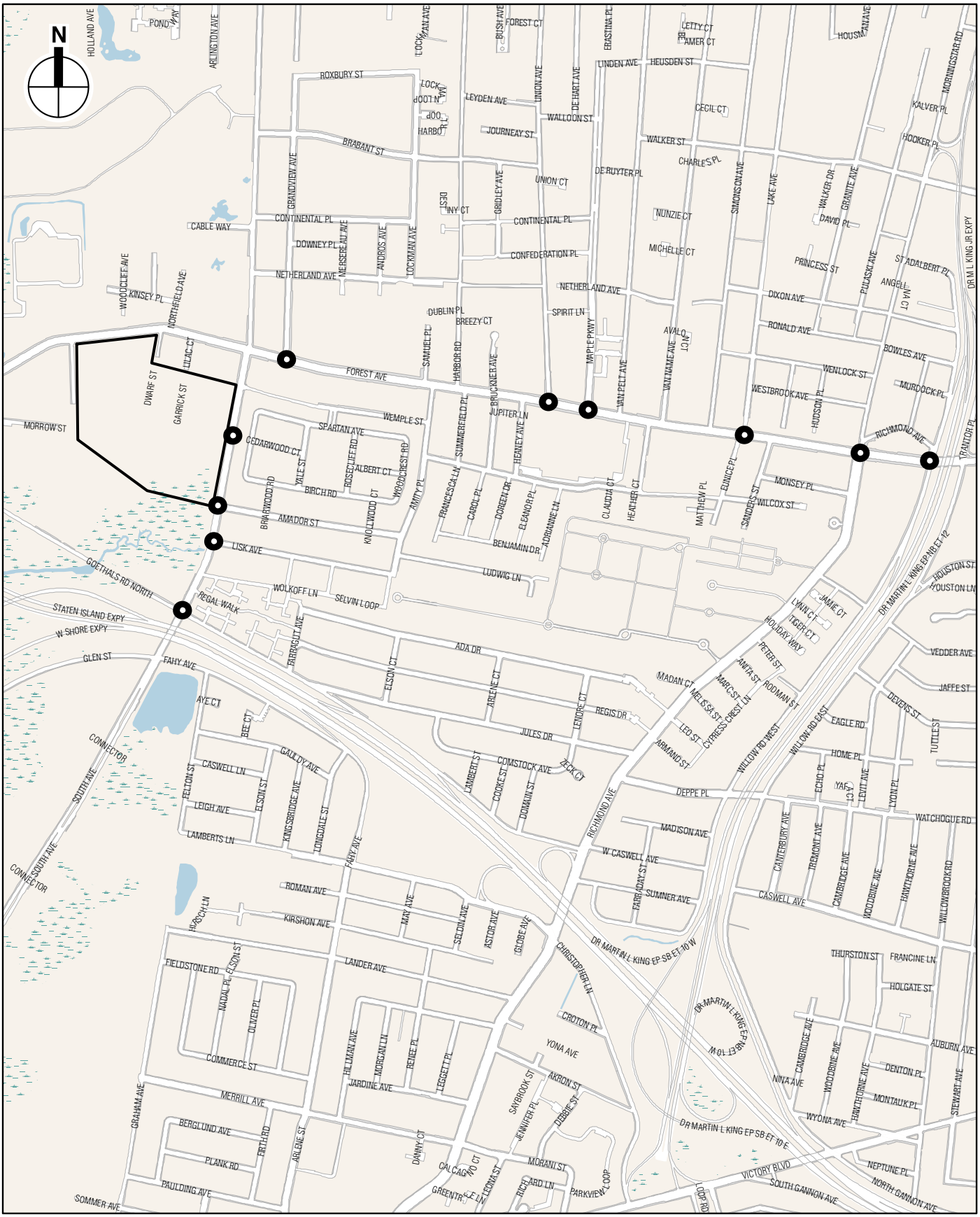
10.31.16



With Action Incremental Vehicle Trips
Saturday Peak Hour
Figure 7-10

South Avenue Retail Development

10/31/2016



Project Site

Traffic Analysis Intersection

South Avenue Retail Development

Traffic Study Area

Figure 7-11

TRAFFIC OPERATIONS

The operation of signalized intersections in the study area was assessed using methodologies presented in the *2000 Highway Capacity Manual (HCM)* using the *Highway Capacity Software (HCS+ 5.5)*. The *HCM* procedure evaluates the levels of service (LOS) for signalized intersections using average stop control delay, in seconds per vehicle, as described below.

SIGNALIZED INTERSECTIONS

The average control delay per vehicle is the basis for LOS determination for individual lane groups (grouping of movements in one or more travel lanes), the approaches, and the overall intersection. The levels of service are defined in **Table 7-8.**

Table 7-8
Level of Service Criteria for Signalized Intersections

LOS	Average Control Delay
A	≤ 10.0 seconds
B	>10.0 and ≤ 20.0 seconds
C	>20.0 and ≤ 35.0 seconds
D	>35.0 and ≤ 55.0 seconds
E	>55.0 and ≤ 80.0 seconds
F	>80.0 seconds

Source:
Transportation Research Board. *Highway Capacity Manual*, 2000.

Although the HCM methodology calculates a volume-to-capacity (v/c) ratio, there is no strict relationship between v/c ratios and LOS as defined in the *HCM*. A high v/c ratio indicates substantial traffic passing through an intersection, but a high v/c ratio combined with low average delay actually represents the most efficient condition in terms of traffic engineering standards, where an approach or the whole intersection processes traffic close to its theoretical maximum capacity with minimal delay. However, very high v/c ratios—especially those approaching or greater than 1.0—are often correlated with a deteriorated LOS. Other important variables affecting delay include cycle length, progression, and green time. LOS A and B indicate good operating conditions with minimal delay. At LOS C, the number of vehicles stopping is higher, but congestion is still fairly light. LOS D describes a condition where congestion levels are more noticeable and individual cycle failures (a condition where motorists may have to wait for more than one green phase to clear the intersection) can occur. Conditions at LOS E and F reflect poor service levels, and cycle breakdowns are frequent. The *HCM* methodology also provides for a summary of the total intersection operating conditions. The analysis chooses the two critical movements (the worst case from each roadway) and calculates a summary critical v/c ratio. The overall intersection delay, which determines the intersection's LOS, is based on a weighted average of control delays of the individual lane groups. Within New York City, the midpoint of LOS D (45 seconds of delay) is generally considered as the threshold between acceptable and unacceptable operations.

Significant Impact Criteria

According to the criteria presented in the *CEQR Technical Manual*, impacts are considered significant and require examination of mitigation if they result in an increase in the With Action condition of 5 or more seconds of delay in a lane group over No Action levels beyond mid-LOS D. For No Action LOS E, a 4-second increase in delay is considered significant. For No Action

LOS F, a 3-second increase in delay is considered significant. In addition, impacts are considered significant if levels of service deteriorate from acceptable A, B, or C in the No Action condition to marginally unacceptable LOS D (a delay in excess of 45 seconds, the midpoint of LOS D), or unacceptable LOS E or F in the With Action condition.

UNSIGNALIZED INTERSECTIONS

For unsignalized intersections, the average control delay is defined as the total elapsed time from which a vehicle stops at the end of the queue until the vehicle departs from the stop line. This includes the time required for the vehicle to travel from the last-in-queue to the first-in-queue position. The average control delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. The LOS criteria for unsignalized intersections are summarized in **Table 7-9**.

Table 7-9
Level of Service Criteria for Unsignalized Intersections

LOS	Average Control Delay
A	≤ 10.0 seconds
B	> 10.0 and ≤ 15.0 seconds
C	> 15.0 and ≤ 25.0 seconds
D	> 25.0 and ≤ 35.0 seconds
E	> 35.0 and ≤ 50.0 seconds
F	> 50.0 seconds

Source:
Transportation Research Board. *Highway Capacity Manual*, 2000.

The LOS thresholds for unsignalized intersections are different from those for signalized intersections. The primary reason is that drivers expect different levels of performance from different types of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection; hence, the corresponding control delays are higher at a signalized intersection than at an unsignalized intersection for the same LOS. In addition, certain driver behavioral considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, whereas drivers on minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections. For these reasons, the corresponding delay thresholds for unsignalized intersections are lower than those of signalized intersections. As with signalized intersections, within New York City, the midpoint of LOS D (30 seconds of delay) is generally perceived as the threshold between acceptable and unacceptable operations.

Significant Impact Criteria

The same sliding scale of significant delays described for signalized intersections applies for unsignalized intersections. For the minor street to trigger significant impacts, at least 90 passenger car equivalents (PCE) must be identified in the With Action condition in any peak hour.

VEHICULAR AND PEDESTRIAN SAFETY EVALUATION

An evaluation of vehicular and pedestrian safety is necessary for locations within the traffic and pedestrian study areas that have been identified as high accident locations, where 48 or more

total reportable and non-reportable crashes or five or more pedestrian/bicyclist injury crashes occurred in any consecutive 12 months of the most recent 3-year period for which data are available. For these locations, accident trends are identified to determine whether projected vehicular and pedestrian traffic would further impact safety at these locations. The determination of potential significant safety impacts depends on the type of area where the project site is located, traffic volumes, accident types and severity, and other contributing factors. Where appropriate, measures to improve traffic and pedestrian safety are identified and coordinated with NYCDOT for their approval.

PARKING CONDITIONS ASSESSMENT

The parking analysis identifies the extent to which off-street parking is available and utilized under existing and future conditions. It takes into consideration anticipated changes in area parking supply and provides a comparison of parking needs versus availability to determine if a parking shortfall is likely to result from parking displacement attributable to or additional demand generated by a proposed project.

C. DETAILED TRAFFIC ANALYSIS

As described above in Section B, "Preliminary Analysis Methodology and Screening Assessment," in consultation with NYCDOT, 10 intersections have been selected for analysis in the weekday midday, PM, and Saturday peak periods.

2016 EXISTING CONDITIONS

ROADWAY NETWORK AND TRAFFIC STUDY AREA

The traffic study area encompasses eight signalized intersections, including one that would be built in the future to provide access to the project site from South Avenue, and two unsignalized intersections. The main vehicular access routes to the site within the study area are discussed below.

Forest Avenue, located on the northern edge of the project site, is a two-way east/west roadway that generally operates with two moving lanes in each direction. The S48, S59, S98, X10, X12, X30, and X42 bus routes operate on the eastbound lanes of Forest Avenue within the study area, while the S48, S59, and S98 bus routes operate along the westbound lanes of Forest Avenue.

South Avenue is a two-way north/south roadway on the eastern edge of the project site that generally operates with one or two lanes in each direction.[1] On-street parking is provided along limited segments of South Avenue. The S46, S96, and X30 bus routes operate along the southbound lanes of South Avenue, while the S46 and S96 bus routes operate along the northbound lanes of South Avenue.

Goethals Road North is a one-way westbound roadway on the southern edge of the study area that operates with three lanes. On-street parking is provided along some segments of Goethals Road North, along the north curbside. It primarily serves traffic from westbound Interstate 278

[1] NOTE: As part of a New York City Department of Design and Construction (NYCDDC) roadway improvement project, South Avenue will be widened north of Forest Avenue in the future No Action and With Action conditions.

off-ramp, as well as traffic headed towards the Interstate 278 westbound on-ramp. The X17 and X30 bus routes operate on the westbound lanes of Goethals Road North west of South Avenue.

Richmond Avenue/Morningstar Road is a two-way north/south roadway on the eastern edge of the study area that generally operates with two lanes in each direction.

Willow Road West is a one-way southbound roadway on the eastern edge of the study area that operates with three lanes. It primarily serves traffic exiting from the southbound Route 440 off-ramp, as well as traffic accessing southbound Route 440 on-ramp.

TRAFFIC CONDITIONS

Traffic data were collected in June 2016 for the weekday midday, PM, and Saturday peak periods via a combination of video data intersection counts and 24-hour Automatic Traffic Recorder (ATR) counts. These traffic counts were used along with observations of traffic conditions to develop balanced traffic networks for the weekday midday and PM peak hours, as well as the Saturday peak hour, which are 1:00 to 2:00 PM, 5:00 to 6:00 PM, and 1:00 to 2:00 PM, respectively.

Inventories of roadway geometry, traffic controls, bus stops, and parking regulations/activities were recorded to provide appropriate inputs for the operational analyses. Official signal timings were also obtained from NYCDOT for use in the analysis of the study area signalized intersections. **Figures 7-12 through 7-14** show the 2016 existing traffic volumes for the weekday midday, PM, and Saturday peak hours, respectively.

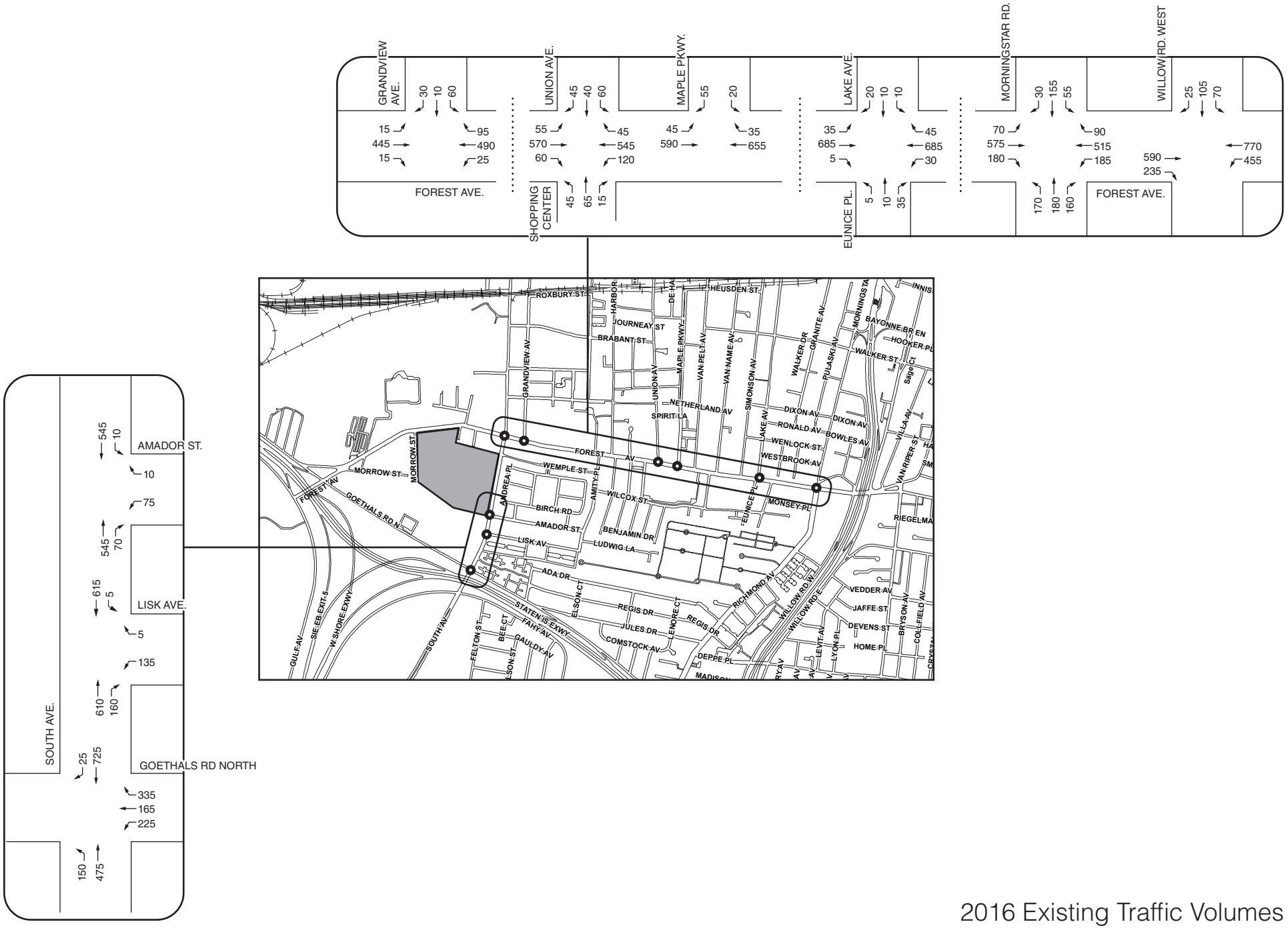
LEVELS OF SERVICE

A summary of the 2016 existing conditions traffic analysis results is presented in **Table 7-10**. Details on level-of-service, v/c ratios, and average delays are presented in **Table 7-11**. Overall, the capacity analysis indicates that most of the study area's intersection approaches/lane groups operate acceptably—at mid-LOS D or better (i.e., with delays of 45 seconds or less per vehicle for signalized intersections and 30 seconds or less per vehicle for unsignalized intersections) for the analysis peak hours. Approaches/lane groups operating beyond mid-LOS D and/or those with v/c ratios of 0.90 or greater are listed below.

Table 7-10
Summary of 2016 Existing Traffic Analysis Results

Level of Service	Analysis Peak Hours		
	Weekday Midday	**Weekday PM**	**Saturday**
Signalized Intersections			
Lane Groups at LOS A/B/C	32	32	29
Lane Groups at LOS D	4	3	3
Lane Groups at LOS E	0	1	3
Lane Groups at LOS F	0	0	1
Total Lane Groups	**36**	**36**	**36**
Lane Groups with v/c ≥ 0.90	0	1	4
Intersections at LOS A/B/C	7	7	6
Intersections at LOS D	0	0	1
Intersections at LOS E	0	0	0
Intersections at LOS F	0	0	0
Total Intersections	**7**	**7**	**7**
Unsignalized Intersections			
Lane Groups at LOS A/B/C	4	3	3
Lane Groups at LOS D	1	1	0
Lane Groups at LOS E	0	0	0
Lane Groups at LOS F	1	2	3
Total Lane Groups	**6**	**6**	**6**
Lane Groups with v/c ≥ 0.90	0	0	0

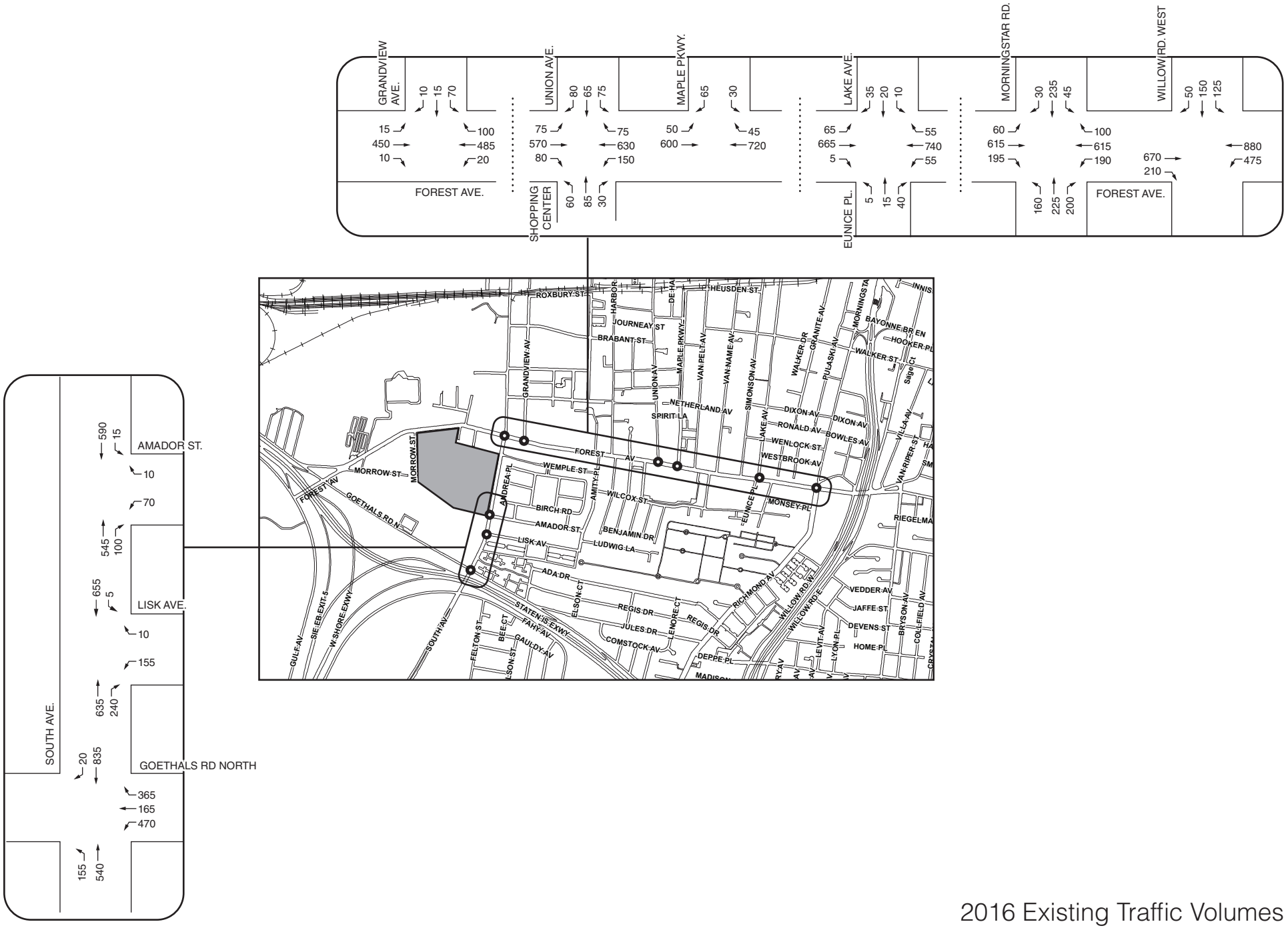
Notes:
LOS = Level-of-Service; v/c = volume-to-capacity ratio.



2016 Existing Traffic Volumes
Weekday Midday Peak Hour

South Avenue Retail Development

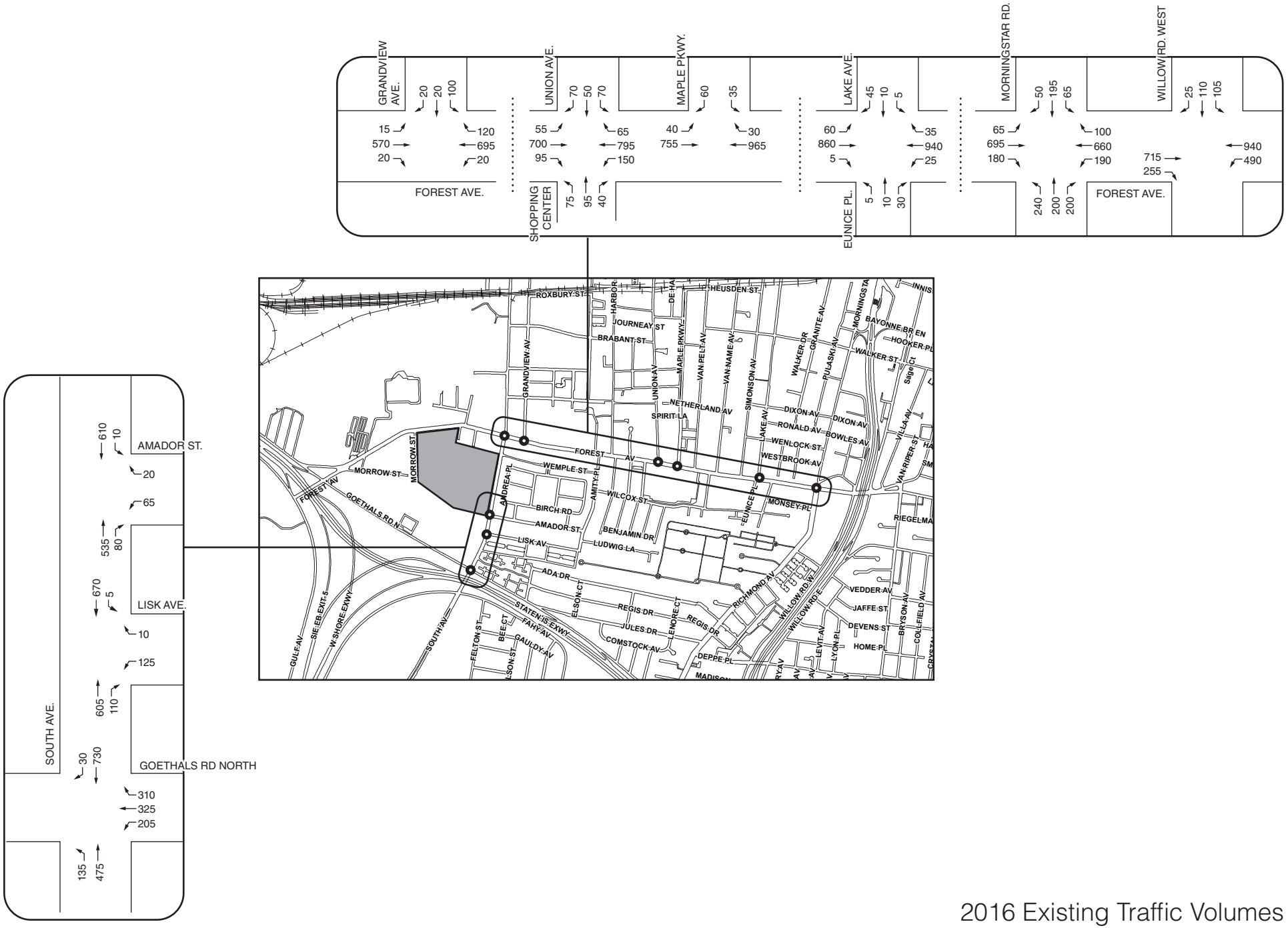
Figure 7-12



2016 Existing Traffic Volumes
Weekday PM Peak Hour

Figure 7-13

South Avenue Retail Development



2016 Existing Traffic Volumes
Saturday Peak Hour
Figure 7-14

South Avenue Retail Development

Table 7-11
2016 Existing Conditions Level of Service Analysis

Intersection	Weekday Midday				Weekday PM				Saturday Midday			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Signalized Intersections												
Forest Avenue @ Grandview Avenue												
Eastbound	LTR	0.30	11.6	B	LTR	0.30	11.6	B	LTR	0.36	12.2	B
Westbound	L	0.08	10.1	B	L	0.07	10.0+	B	L	0.08	10.2	B
	TR	0.34	12.0	B	TR	0.35	12.1	B	TR	0.50	13.8	B
Southbound	LTR	0.24	22.1	C	LTR	0.21	21.8	C	LTR	0.29	22.8	C
	Intersection		12.8	B	Intersection		12.7	B	Intersection		14.0	B
Forest Avenue @ Richmond Avenue—Morningstar Road												
Eastbound	L	0.41	30.3	C	L	0.41	30.9	C	L	0.49	87.7	F
	TR	0.87	39.9	D	TR	0.93	45.7	D	TR	0.96	72.9	E
Westbound	L	0.77	36.6	D	L	0.78	38.8	D	L	0.80	40.3	D
	TR	0.39	15.9	B	TR	0.48	17.0	B	TR	0.54	17.9	B
Northbound	L	0.61	29.5	C	L	0.58	27.3	C	L	0.84	48.6	D
	T	0.31	19.6	B	T	0.34	20.1	C	T	0.34	20.1	C
	R	0.22	9.7	A	R	0.27	10.3	B	R	0.27	10.3	B
Southbound	LTR	0.78	44.9	D	LTR	0.83	49.2	D	LTR	0.94	64.3	E
	Intersection		29.6	C	Intersection		31.8	C	Intersection		45.4	D
Forest Avenue @ Union Avenue												
Eastbound	L	0.20	11.7	B	L	0.31	13.9	B	L	0.24	13.0	B
	TR	0.36	12.1	B	TR	0.39	12.5	B	TR	0.43	12.9	B
Westbound	L	0.43	16.1	B	L	0.56	20.6	C	L	0.69	28.4	C
	TR	0.35	12.1	B	TR	0.42	12.9	B	TR	0.48	13.6	B
Northbound	L	0.15	21.2	C	L	0.23	22.7	C	L	0.27	23.2	C
	TR	0.17	21.1	C	TR	0.24	22.1	C	TR	0.27	22.4	C
Southbound	LTR	0.36	24.0	C	LTR	0.54	28.0	C	LTR	0.47	26.5	C
	Intersection		14.3	B	Intersection		16.1	B	Intersection		16.6	B
Forest Avenue @ Willow Road West												
Eastbound	TR	0.70	25.9	C	TR	0.71	26.5	C	TR	0.75	25.6	C
Westbound	DefL	0.58	15.3	B	L	0.74	27.0	C	L	0.97	64.0	E
	T	0.68	16.0	B	LT	0.78	17.3	B	LT	0.93	28.5	C
Southbound	L	0.17	24.6	C	L	0.31	27.4	C	L	0.28	26.9	C
	T	0.22	25.2	C	T	0.33	27.6	C	T	0.27	26.8	C
	R	0.08	23.6	C	R	0.16	25.5	C	R	0.08	24.5	C
	Intersection		20.4	C	Intersection		22.8	C	Intersection		31.1	C
South Avenue @ Amador Street												
Westbound	LR	0.25	28.8	C	LR	0.24	28.6	C	LR	0.26	28.9	C
Northbound	TR	0.56	10.9	B	TR	0.58	11.3	B	TR	0.58	11.2	B
Southbound	LT	0.27	7.2	A	LT	0.30	7.4	A	LT	0.31	7.4	A
	Intersection		10.7	B	Intersection		10.7	B	Intersection		10.7	B
South Avenue @ Lisk Avenue												
Westbound	LR	0.62	45.9	D	LR	0.82	61.3	E	LR	0.65	47.6	D
Northbound	T	0.45	6.2	A	T	0.46	6.2	A	T	0.46	6.3	A
	R	0.12	4.0	A	R	0.15	4.2	A	R	0.08	3.8	A
Southbound	LT	0.27	4.6	A	LT	0.30	4.7	A	LT	0.29	4.7	A
	Intersection		9.2	A	Intersection		11.7	B	Intersection		9.5	A
South Av @ Goethals Road North												
Westbound	LTR	0.58	26.6	C	LTR	0.79	31.6	C	LTR	0.63	27.3	C
Northbound	L	0.45	16.3	B	L	0.48	18.2	B	L	0.36	14.7	B
	T	0.51	14.2	B	T	0.53	14.4	B	T	0.53	14.4	B
Southbound	TR	0.69	29.2	C	TR	0.78	31.9	C	TR	0.68	29.1	B
	Intersection		23.9	C	Intersection		27.4	C	Intersection		24.1	C
Unsignalized Intersections												
Forest Avenue @ Lake Avenue—Eunice Place												
Eastbound	LT	0.06	9.9	A	LT	0.10	10.7	B	LT	0.11	11.8	B
Westbound	LT	0.05	10.0-	A	LT	0.08	9.9	A	LT	0.04	10.5	B
Northbound	LTR	0.33	34.2	D	LTR	0.62	75.8	F	LTR	0.68	114.3	F
Southbound	LTR	0.40	53.1	F	LTR	0.89	149.8	F	LTR	0.74	109.7	F
Forest Avenue @ Maple Parkway												
Eastbound	LT	0.07	10.0-	A	LT	0.09	10.8	B	LT	0.08	11.6	B
Southbound	LR	0.26	18.7	C	LR	0.45	29.2	D	LR	0.63	55.7	F

Notes:
L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service; v/c = Volume to Capacity.

Forest Avenue

- Eastbound left-turn at the intersection of Forest Avenue and Richmond Avenue/Morningstar Road (LOS F with a v/c ratio of 0.49 and a delay of 87.7 seconds per vehicle [spv] during the Saturday peak hour);

- Eastbound through-right lane group at the intersection of Forest Avenue and Richmond Avenue/Morningstar Road (LOS E with a v/c ratio of 0.93 and a delay of 45.7 spv during the weekday PM peak hour; LOS E with a v/c ratio of 0.96 and a delay of 72.9 spv during the Saturday peak hour);
- Westbound left-turn at the intersection of Forest Avenue and Willow Road West (LOS E with a v/c ratio of 0.97 and a delay of 64.0 spv during the Saturday peak hour);

Richmond Avenue/Morningstar Road

- Northbound left-turn at the intersection of Forest Avenue and Richmond Avenue/ Morningstar Road (LOS D with a v/c ratio of 0.84 and a delay of 48.6 spv during the Saturday peak hour);
- Southbound approach at the intersection of Forest Avenue and Richmond Avenue/ Morningstar Road (LOS D with a v/c ratio of 0.83 and a delay of 49.2 spv during the weekday PM peak hour; LOS E with a v/c ratio of 0.94 and a delay of 64.3 spv during the Saturday peak hour);

Lisk Avenue

- Westbound approach at the intersection of South Avenue and Lisk Avenue (LOS D with a v/c ratio of 0.62 and a delay of 45.9 spv during the weekday midday peak hour; LOS E with a v/c ratio of 0.82 and a delay of 61.3 spv during the weekday PM peak hour; LOS D with a v/c ratio of 0.65 and a delay of 47.6 spv during the Saturday peak hour);

Lake Avenue/Eunice Place

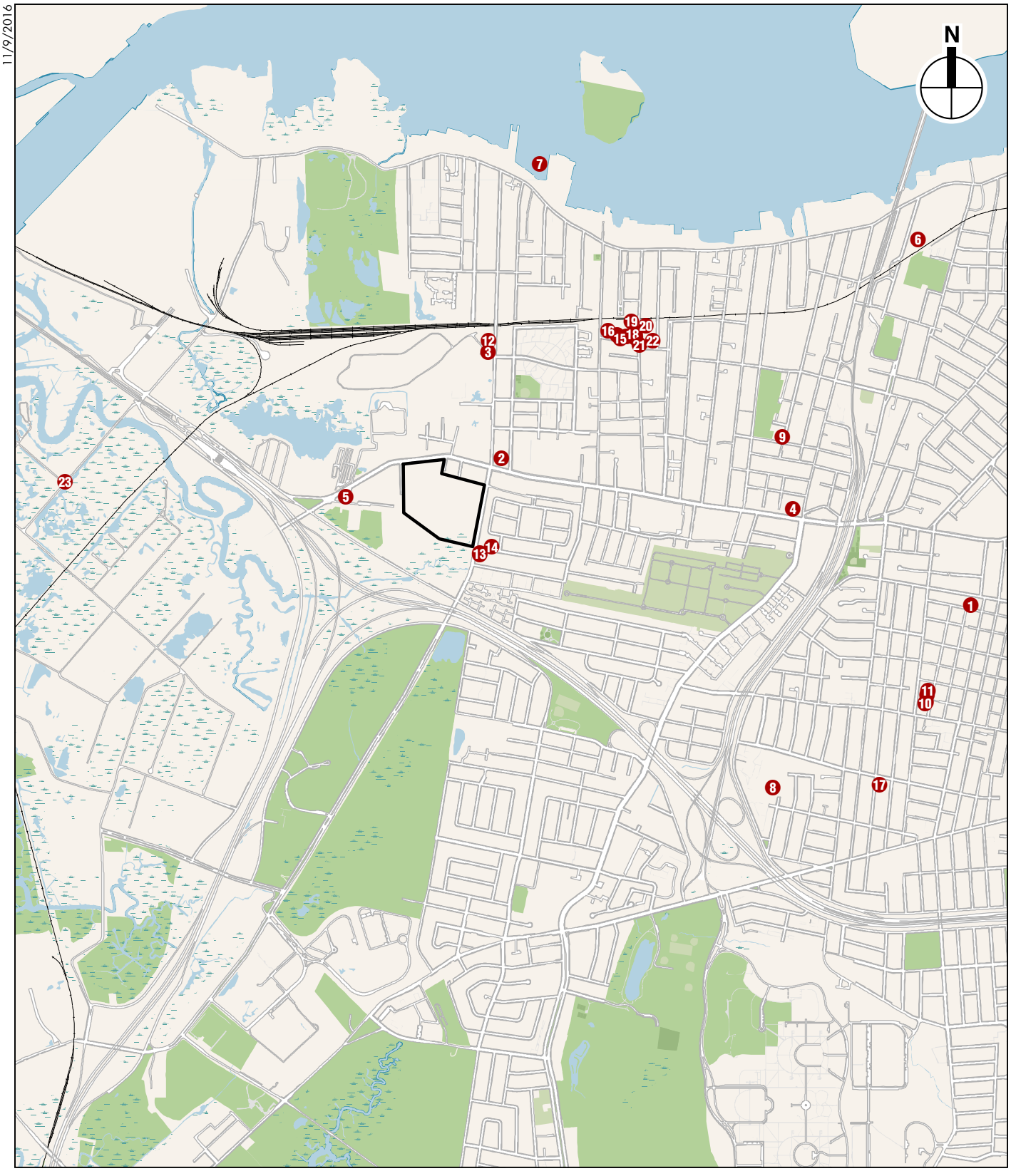
- Northbound approach at the intersection of Forest Avenue and Lake Avenue/Eunice Place (LOS E with a v/c ratio of 0.33 and a delay of 34.2 spv during the weekday midday peak hour; LOS F with a v/c ratio of 0.62 and a delay of 75.8 spv during the weekday PM peak hour; LOS F with a v/c ratio of 0.68 and a delay of 114.3 spv during the Saturday peak hour);
- Southbound approach at the intersection of Forest Avenue and Lake Avenue/Eunice Place (LOS F with a v/c ratio of 0.40 and a delay of 53.1 spv during the weekday midday peak hour; LOS F with a v/c ratio of 0.89 and a delay of 149.8 spv during the weekday PM peak hour; LOS F with a v/c ratio of 0.74 and a delay of 109.7 spv during the Saturday peak hour); and

Maple Parkway

- Southbound approach at the intersection of Forest Avenue and Maple Parkway (LOS F with a v/c ratio of 0.63 and a delay of 55.7 spv during the Saturday peak hour)

THE FUTURE WITHOUT THE PROPOSED PROJECT

The No Action condition was developed by increasing existing (2016) traffic levels by the expected growth in overall travel through and within the study area. As per *CEQR Technical Manual* guidelines, an annual background growth rate of 1.00 percent was assumed (year 2016 to year 2019). In addition to the No Action development on the project site, a total of 23 development projects expected to occur in the No Action condition (No Build projects) were identified as being planned for the ½-mile study area (see **Figure 7-15**). However, some of these planned projects are modest in size and would be very modest traffic generators. After reviewing the development programs for each of the planned projects, it was determined that background growth will address the increase in traffic levels for 20 of the small- to moderate-sized projects in



South Avenue Retail Development

No Build Projects
Figure 7-15

the study area. For the other No Build projects, including development components that are anticipated to be completed by 2019 for Phase 1 of the Staten Island Marine Development (SIMD) project, person and vehicle trips were determined and incorporated into the No Action analysis. **Table 7-12** and **Figure 7-15** summarize the projects that were accounted for in this future 2019 baseline, including those that were considered as part of the study area background growth.

CHANGES TO THE STUDY AREA STREET NETWORK

In addition to the development projects noted above, a number of roadway improvements throughout the traffic study area will also exist in the 2019 No Action Condition, and were also incorporated into the No Action traffic analysis. These roadway improvements consist of:

- A new project driveway for the No Action development on the project site will intersect with South Avenue south of Wemple Street, and will be unsignalized with only right-in/right-out movements permitted.
- A new signalized intersection was installed at Forest Avenue and Maple Parkway prior to September 2016, but had yet to be installed when the baseline traffic data was collected in June 2016. The intersection was unsignalized during the data collection and was analyzed as such for the 2016 Existing Condition.
- A re-construction of the northbound and southbound moving lanes of South Avenue and Forest Avenue, which will add two effective 11-foot-wide moving lanes to the southbound approach, add one 11-foot-wide moving lane to the northbound approach, and re-align the intersection. The construction is anticipated to start in November 2016 and is expected to be completed before the end of 2017.

Table 7-12
No Build Projects Expected to be Complete by 2019

Map Ref. No.[1]	Project Name/ Address	Development Program	Transportation Assumptions
Development Projects Within ½-Mile			
1	475 Maine Avenue	1 residential unit	Included in background growth
2	2295 Forest Avenue	19,000 gsf retail	Transportation assumptions from *CEQR Technical Manual*, *Gateway Estates II FEIS* (2009), and *Brooklyn Bay Center FEIS* (2011)
3	288 South Avenue	4,829 gsf retail, 17 parking spaces	Included in background growth
4	1815 Forest Avenue	4,242 gsf retail, 11 parking spaces	Included in background growth
5	2560 Forest Avenue	10,557 gsf manufacturing, 12 parking spaces	Included in background growth
6	67 Riverside Lane	2 residential units	Included in background growth
7	3153 Richmond Terrace	30,995 gsf office, 58 parking spaces	Transportation assumptions from *CEQR Technical Manual, New Stapleton Waterfront Development FEIS* (2005), and U.S. Census Bureau American Community Survey 2006-2010 Reverse Journey to Work estimates
8	200 Cambridge Avenue	32,140 gsf school, 42 parking spaces	Included in background growth
9	235 Dixon Avenue	1 residential unit	Included in background growth
10	184 Muller Avenue	1 residential unit, 1 parking space	Included in background growth
11	170 Muller Avenue	1 residential unit, 1 parking space	Included in background growth
12	264 South Avenue	1,280 gsf retail	Included in background growth
13	621 South Avenue	1 residential unit, 2 parking spaces	Included in background growth
14	623 South Avenue	1 residential unit, 2 parking spaces	Included in background growth
15	26 McGee Lane	1 residential unit, 2 parking spaces	Included in background growth
16	36 McGee Lane	2 residential units, 2 parking spaces	Included in background growth
17	309 Bryson Avenue	2 residential units, 2 parking spaces	Included in background growth
18	132 Union Avenue	1 residential unit, 2 parking spaces	Included in background growth
19	134 Union Avenue	1 residential unit, 2 parking spaces	Included in background growth
20	136 Union Avenue	1 residential unit, 2 parking spaces	Included in background growth
21	138 Union Avenue	1 residential unit, 2 parking spaces	Included in background growth
22	140 Union Avenue	1 residential unit, 2 parking spaces	Included in background growth
23	Staten Island Marine Development—Phase 1	Building 1 (975,000 gsf) and Building 2 (450,000 gsf), both High Cube Warehouses	Transportation assumptions from Staten Island Marine Development Travel Demand Analysis Memorandum (2015)

Notes:
[1] See **Figure 7-15**.
[2] Projects that are currently under construction are assumed to be complete by 2019; projects for which an expected date of completion is not available are assumed to be complete by the proposed project's Build year of 2019.
Sources:
DCP; NYC Dept. of Buildings.

TRAFFIC OPERATIONS

The No Action condition traffic volumes are shown in **Figures 7-16 through 7-18** for the weekday midday, PM, and Saturday peak hours. The No Action condition traffic volumes were projected by layering on top of the existing volumes the following: background growth, incremental trips generated by the No Action development on the project site, and other discrete No Build projects in the area. A summary of the 2019 No Action condition traffic analysis results is presented in **Table 7-13**. Details on level-of-service, v/c ratios, and average delays are presented in **Table 7-14 and Table 7-15**.

Table 7-13
Summary of 2019 No Action Condition Traffic Analysis Results

Level of Service	Analysis Peak Hours		
	Weekday Midday	Weekday PM	Saturday
Signalized Intersections			
Lane Groups at LOS A/B/C	33	31	28
Lane Groups at LOS D	5	4	7
Lane Groups at LOS E	1	3	2
Lane Groups at LOS F	1	2	3
Total Lane Groups	**40**	**40**	**40**
Lane Groups with v/c ≥ 0.90	2	6	6
Intersections at LOS A/B/C	7	6	7
Intersections at LOS D	1	1	0
Intersections at LOS E	0	1	0
Intersections at LOS F	0	0	1
Total Intersections	**8**	**8**	**8**
Unsignalized Intersections			
Lane Groups at LOS A/B/C	3	3	3
Lane Groups at LOS D	0	0	0
Lane Groups at LOS E	0	0	0
Lane Groups at LOS F	2	2	2
Total Lane Groups	**5**	**5**	**5**
Lane Groups with v/c ≥ 0.90	0	2	2

Notes:
LOS = Level-of-Service; v/c = volume-to-capacity ratio.

Based on the analysis results presented in **Table 7-13 and Table 7-14**, the majority of the approaches/lane-groups will operate at the same LOS as in the existing conditions. The following approaches/lane-groups are expected to operate at deteriorated LOS when compared to the existing conditions:

Richmond Avenue/Morningstar Road

- Southbound approach at the intersection of Richmond Avenue/Morningstar Road and Forest Avenue will deteriorate to LOS D with a v/c ratio of 0.84 and a delay of 50.4 spv in the weekday midday peak hour, and will deteriorate to LOS E with a v/c ratio of 0.89 and a delay of 55.8 spv in the weekday PM peak hour;

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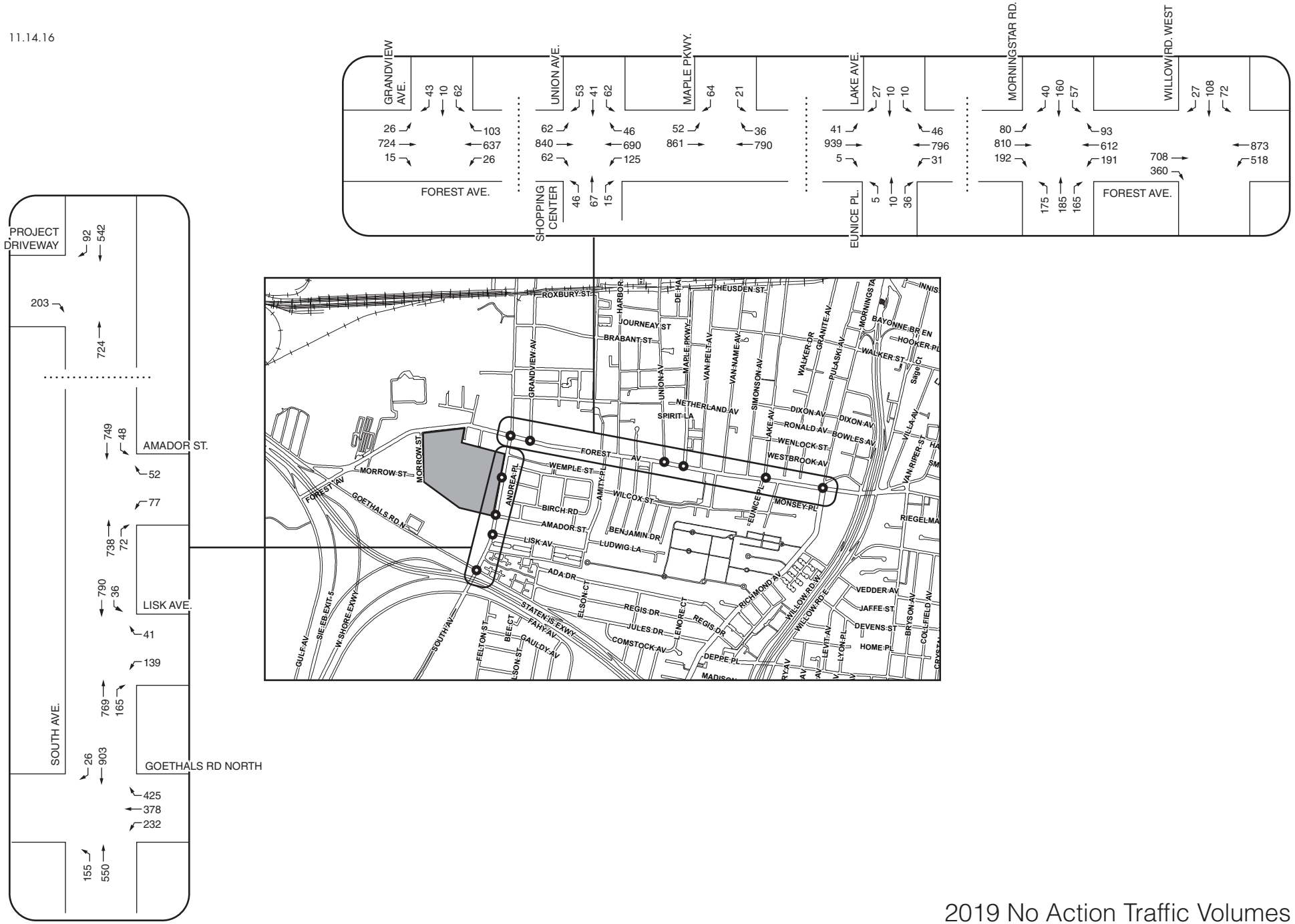

2019 No Action Traffic Volumes
Weekday Midday Peak Hour

South Avenue Retail Development

Figure 7-16

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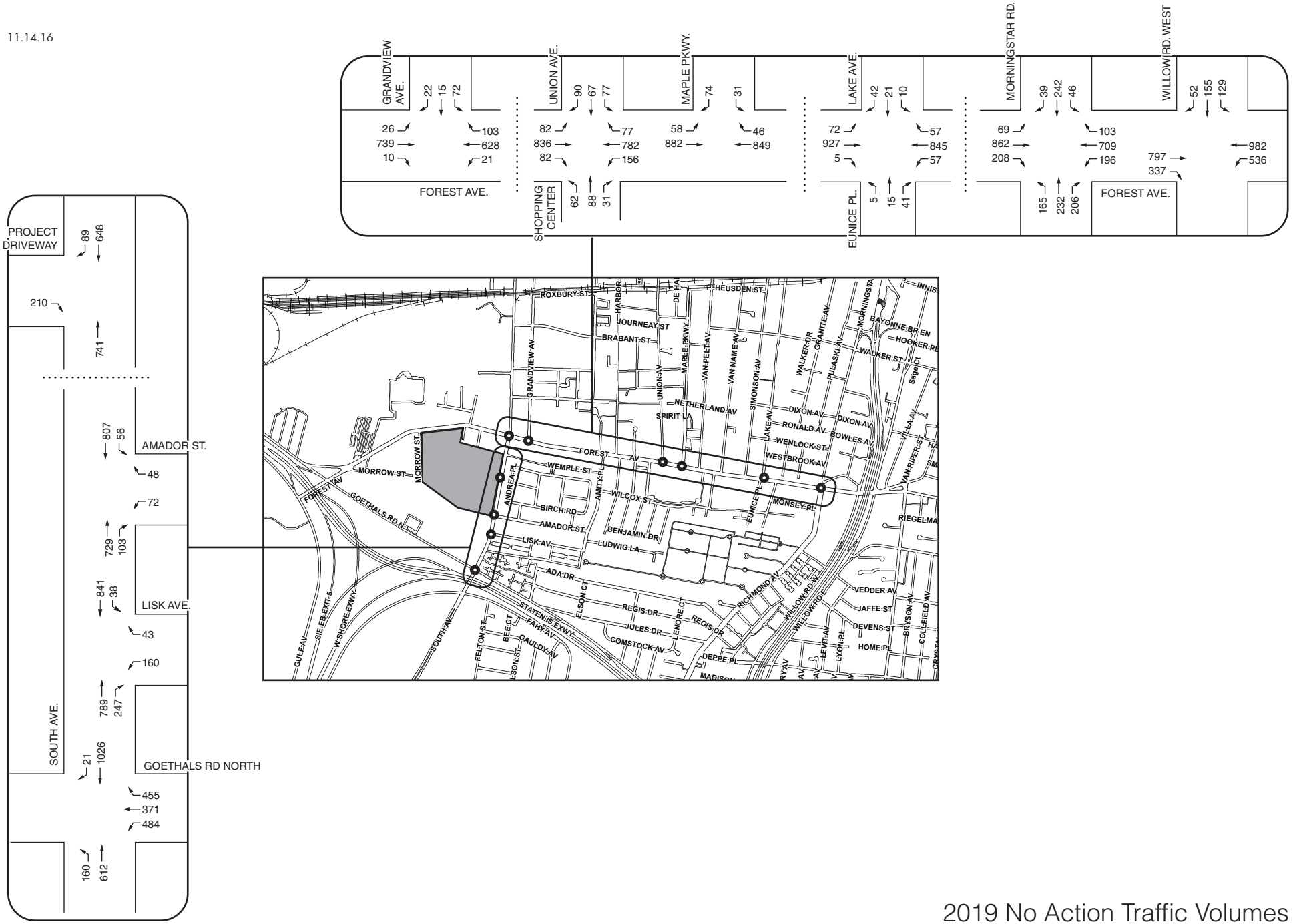

2019 No Action Traffic Volumes
Weekday PM Peak Hour

South Avenue Retail Development

Figure 7-17

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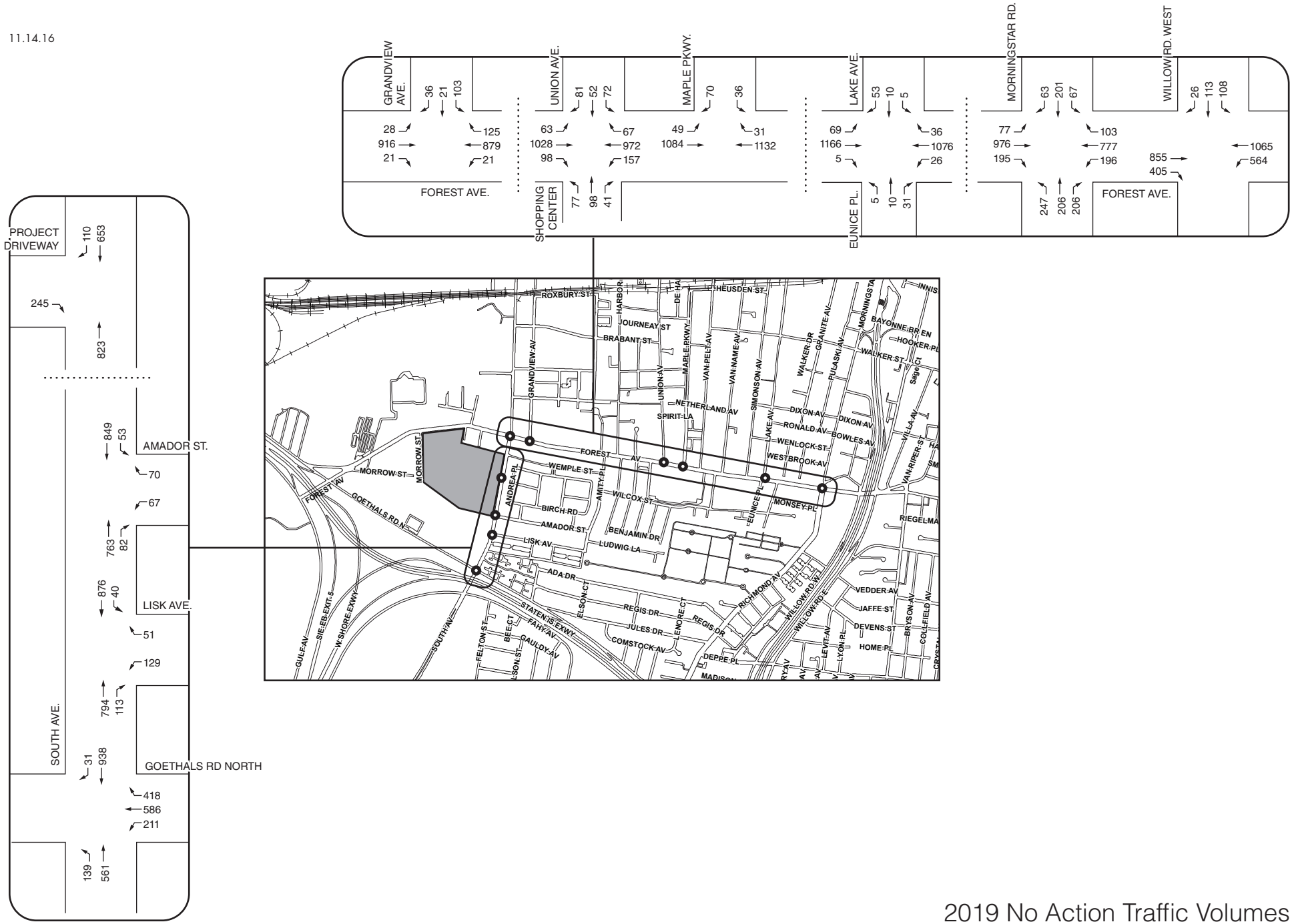

2019 No Action Traffic Volumes
Saturday Peak Hour

South Avenue Retail Development

Figure 7-18

Table 7-14
2016 Existing and 2019 No Action Condition Level of Service Analysis
Signalized Intersections

	Weekday Midday								Weekday PM								Saturday							
	2016 Existing				2019 No Action				2016 Existing				2019 No Action				2016 Existing				2019 No Action			
Intersection	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Forest Avenue @ Grandview Avenue																								
Eastbound	LTR	0.30	11.6	B	LTR	0.49	13.7	B	LTR	0.30	11.6	B	LTR	0.50	13.9	B	LTR	0.36	12.2	B	LTR	0.61	15.5	B
Westbound	L	0.08	10.1	B	L	0.13	11.0	B	L	0.07	10.0	B	L	0.11	10.9	B	L	0.08	10.2	B	L	0.14	11.7	B
	TR	0.34	12.0	B	TR	0.43	13.0	B	TR	0.35	12.1	B	TR	0.44	13.0	B	TR	0.50	13.8	B	TR	0.62	15.7	B
Southbound	LTR	0.24	22.1	C	LTR	0.27	22.6	C	LTR	0.21	21.8	C	LTR	0.25	22.3	C	LTR	0.29	22.8	C	LTR	0.34	23.6	C
	Intersection		12.8	B	Intersection		14.1	B	Intersection		12.7	B	Intersection		14.1	B	Intersection		14.0	B	Intersection		16.2	B
Forest Avenue @ Maple Parkway																								
Eastbound	Unsignalized intersection in No Action Condition				L	0.30	18.2	B	Unsignalized intersection in No Action Condition				L	0.43	23.1	C	Unsignalized intersection in No Action Condition				L	0.60	41.2	D
Westbound					T	0.54	17.8	B					T	0.52	17.4	B					T	0.64	19.4	B
					TR	0.54	17.9	B					TR	0.60	18.9	B					TR	0.74	22.1	C
Southbound					LR	0.16	17.2	B					LR	0.19	17.6	B					LR	0.18	17.5	B
					Intersection		17.8	B					Intersection		18.3	B					Intersection		21.1	C
Forest Avenue @ Richmond Avenue/Morningstar Road																								
Eastbound	L	0.41	30.3	C	L	0.52	35.2	D	L	0.41	30.9	C	L	0.51	35.9	D	L	0.49	87.7	F	L	0.65	146.5	F
	TR	0.87	39.9	D	TR	1.14	104.7	F	TR	0.93	45.7	D	TR	1.20	132.7	F	TR	0.96	72.9	E	TR	1.28	199.8	F
Westbound	L	0.77	36.6	D	L	0.80	42.7	D	L	0.78	38.8	D	L	0.81	41.6	D	L	0.80	40.3	D	L	0.81	43.2	D
	TR	0.39	15.9	B	TR	0.46	16.7	B	TR	0.48	17.0	B	TR	0.54	17.9	B	TR	0.54	17.9	B	TR	0.63	19.4	B
Northbound	L	0.61	29.5	C	L	0.64	31.7	C	L	0.58	27.3	C	L	0.61	29.7	C	L	0.84	48.6	D	L	0.88	53.8	D
	T	0.31	19.6	B	T	0.32	19.8	B	T	0.34	20.1	C	T	0.35	20.3	C	T	0.34	20.1	C	T	0.35	20.2	C
	R	0.22	9.7	A	R	0.22	9.8	A	R	0.27	10.3	B	R	0.28	10.4	B	R	0.27	10.3	B	R	0.28	10.4	B
Southbound	LTR	0.78	44.9	D	LTR	0.84	50.4	D	LTR	0.83	49.2	D	LTR	0.89	55.8	E	LTR	0.94	64.3	E	LTR	1.00	79.6	E
	Intersection		29.6	C	Intersection		54.3	D	Intersection		31.8	C	Intersection		64.5	E	Intersection		45.4	D	Intersection		93.0	F
Forest Avenue @ Union Avenue																								
Eastbound	L	0.20	11.7	B	L	0.27	13.2	B	L	0.31	13.9	B	L	0.43	17.6	B	L	0.24	13.0	B	L	0.37	17.1	B
	TR	0.36	12.1	B	TR	0.51	13.9	B	TR	0.39	12.5	B	TR	0.55	14.5	B	TR	0.43	12.9	B	TR	0.61	15.4	B
Westbound	L	0.43	16.1	B	L	0.69	31.2	C	L	0.56	20.6	C	L	0.94	71.2	E	L	0.69	28.4	C	L	1.30	191.1	F
	TR	0.35	12.1	B	TR	0.43	13.0	B	TR	0.42	12.9	B	TR	0.52	14.1	B	TR	0.48	13.6	B	TR	0.58	15.1	B
Northbound	L	0.15	21.2	C	L	0.15	21.3	C	L	0.23	22.7	C	L	0.25	23.0	C	L	0.27	23.2	C	L	0.28	23.5	C
	TR	0.17	21.1	C	TR	0.17	21.2	C	TR	0.24	22.1	C	TR	0.25	22.2	C	TR	0.27	22.4	C	TR	0.28	22.5	C
Southbound	LTR	0.36	24.0	C	LTR	0.38	24.5	C	LTR	0.54	28.0	C	LTR	0.59	29.5	C	LTR	0.47	26.5	C	LTR	0.52	27.6	C
	Intersection		14.3	B	Intersection		16.1	B	Intersection		16.1	B	Intersection		20.3	C	Intersection		16.6	B	Intersection		28.5	C
Forest Avenue @ Willow Road West																								
Eastbound	TR	0.70	25.9	C	TR	0.91	37.0	D	TR	0.71	26.5	C	TR	0.93	39.1	D	TR	0.75	25.6	C	TR	0.98	45.9	D
Westbound	DefL	0.58	15.3	B	DefL	0.56	17.4	B	L	0.74	27.0	C	DefL	0.48	15.1	B	L	0.97	64.0	E	DefL	0.52	17.5	B
	T	0.68	16.0	B	T	0.77	18.9	B	LT	0.78	17.3	B	T	0.87	22.9	C	LT	0.93	28.5	C	T	1.00	42.7	D
Southbound	L	0.17	24.6	C	L	0.17	24.7	C	L	0.31	27.4	C	L	0.32	27.6	C	L	0.28	26.9	C	L	0.28	27.0	C
	T	0.22	25.2	C	T	0.22	25.3	C	T	0.33	27.6	C	T	0.34	27.8	C	T	0.27	26.8	C	T	0.28	26.9	C
	R	0.08	23.6	C	R	0.08	23.7	C	R	0.16	25.5	C	R	0.16	25.5	C	R	0.08	24.5	C	R	0.09	24.5	C
	Intersection		20.4	C	Intersection		26.6	C	Intersection		22.8	C	Intersection		28.1	C	Intersection		31.1	C	Intersection		38.2	D
South Avenue @ Amador Street																								
Westbound	LR	0.25	28.8	C	LR	0.39	31.3	C	LR	0.24	28.6	C	LR	0.37	30.8	C	LR	0.26	28.9	C	LR	0.42	31.9	C
Northbound	TR	0.56	10.9	B	TR	0.74	15.2	B	TR	0.58	11.3	B	TR	0.75	15.5	B	TR	0.58	11.2	B	TR	0.80	17.5	B
Southbound	LT	0.27	7.2	A	LT	0.42	8.4	A	LT	0.30	7.4	A	LT	0.45	8.7	A	LT	0.31	7.4	A	LT	0.47	8.9	A
	Intersection		10.7	B	Intersection		13.4	B	Intersection		10.7	B	Intersection		13.4	B	Intersection		10.7	B	Intersection		14.6	B
South Avenue @ Lisk Avenue																								
Westbound	LR	0.62	45.9	D	LR	0.83	63.2	E	LR	0.82	61.3	E	LR	1.03	102.3	F	LR	0.65	47.6	D	LR	0.89	72.2	E
Northbound	T	0.45	6.2	A	T	0.57	7.6	A	T	0.46	6.2	A	T	0.57	7.5	A	T	0.46	6.3	A	T	0.61	8.1	A
	R	0.12	4.0	A	R	0.12	4.0	A	R	0.15	4.2	A	R	0.16	4.2	A	R	0.08	3.8	A	R	0.08	3.8	A
Southbound	LT	0.27	4.6	A	LT	0.40	5.4	A	LT	0.30	4.7	A	LT	0.43	5.6	A	LT	0.29	4.7	A	LT	0.44	5.7	A
	Intersection		9.2	A	Intersection		11.9	B	Intersection		11.7	B	Intersection		17.0	B	Intersection		9.5	A	Intersection		13.2	B
South Av @ Goethals Road North																								
Westbound	LTR	0.58	26.6	C	LTR	0.82	32.9	C	LTR	0.79	31.6	D	LTR	1.03	62.8	E	LTR	0.63	27.3	C	LTR	0.90	37.5	D
Northbound	L	0.45	16.3	B	L	0.51	19.5	B	L	0.48	18.2	B	L	0.50	20.2	C	L	0.36	14.7	B	L	0.40	17.5	B
	T	0.51	14.2	B	T	0.59	15.7	B	T	0.53	14.4	B	T	0.60	15.7	B	T	0.53	14.4	B	T	0.63	16.3	B
Southbound	TR	0.69	29.2	C	TR	0.85	35.6	D	TR	0.78	31.9	C	TR	0.95	45.5	D	TR	0.68	29.1	C	TR	0.87	36.8	D
	Intersection		23.9	C	Intersection		29.4	C	Intersection		27.4	C	Intersection		46.2	D	Intersection		24.1	C	Intersection		31.9	C

Notes:
L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service; v/c = Volume to Capacity.

Table 7-15
2016 Existing and 2019 No Action Condition Level of Service Analysis
Unsignalized Intersections

	Weekday Midday								Weekday PM								Saturday							
	2016 Existing				2019 No Action				2016 Existing				2019 No Action				2016 Existing				2019 No Action			
	Lane	v/c	Delay		Lane	v/c	Delay		Lane	v/c	Delay		Lane	v/c	Delay		Lane	v/c	Delay		Lane	v/c	Delay	
Intersection	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS
Forest Avenue @ Lake Avenue—Eunice Place																								
Eastbound	LT	0.06	9.9	A	LT	0.07	10.5	B	LT	0.10	10.7	B	LT	0.13	11.5	B	LT	0.11	11.8	B	LT	0.15	13.1	B
Westbound	LT	0.05	10.0	A	LT	0.06	11.5	B	LT	0.08	9.9	A	LT	0.11	11.3	B	LT	0.04	10.5	B	LT	0.06	12.6	B
Northbound	LTR	0.33	34.2	D	LTR	0.65	94.1	F	LTR	0.62	75.8	F	LTR	**	**	F	LTR	0.68	114.3	F	LTR	**	**	F
Southbound	LTR	0.40	53.1	F	LTR	0.79	149.6	F	LTR	0.89	149.8	F	LTR	2.20	760.5	F	LTR	0.74	109.7	F	LTR	**	**	F
South Avenue @ Project Driveway																								
Eastbound					R	0.33	13.2	B					R	0.36	13.9	B					R	0.43	15.0	C
Forest Avenue @ Maple Parkway																								
Eastbound	LT	0.07	10.0	A	Signalized intersection in				LT	0.09	10.8	B	Signalized intersection in				LT	0.08	11.6	B	Signalized intersection in			
Southbound	LR	0.26	18.7	C	2019 No Action Condition				LR	0.45	29.2	D	2019 No Action Condition				LR	0.63	55.7	F	2019 No Action Condition			

Notes:
L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service; v/c = Volume to Capacity; ** = Delay values not reported by the HCS model.

Forest Avenue

- Eastbound through-right turn at Richmond Avenue/Morningstar Road and Forest Avenue will deteriorate to LOS F with a v/c ratio of 1.14 and a delay of 104.7 spv during the weekday midday peak hour, will deteriorate to LOS F with a v/c ratio of 1.20 and a delay of 132.7 spv during the weekday PM peak hour, and will deteriorate to LOS F with a v/c ratio of 1.28 and a delay of 199.8 spv during the Saturday peak hour;
- Westbound left at Union Avenue and Forest Avenue will deteriorate to LOS E with a v/c ratio of 0.94 and a delay of 71.2 spv during the weekday PM peak hour, and will deteriorate to LOS F with a v/c ratio of 1.30 and a delay of 191.1 spv during the Saturday peak hour;
- Eastbound approach at Willow Road West and Forest Avenue will deteriorate to LOS D with a v/c ratio of 0.98 and a delay of 45.9 spv during the Saturday peak hour;

Lisk Avenue

- Westbound approach at South Avenue and Lisk Avenue will deteriorate to LOS E with a v/c ratio of 0.83 and a delay of 63.2 spv during the weekday midday peak hour, will deteriorate to LOS F with a v/c ratio of 1.03 and a delay of 102.3 spv during the weekday PM peak hour, and will deteriorate to LOS E with a v/c ratio of 0.89 and a delay of 72.2 spv during the Saturday peak hour;

Goethals Road North

- Westbound approach at South Avenue and Goethals Road North will deteriorate to LOS E with a v/c ratio of 1.03 and a delay of 62.8 spv during the weekday PM peak hour; and

South Avenue

- Southbound approach at South Avenue and Goethals Road North will deteriorate to LOS D with a v/c ratio of 0.95 and a delay of 45.5 spv during the weekday PM peak hour.

THE FUTURE WITH THE PROPOSED PROJECT

PROPOSED PROJECT

The proposed project would include approximately 226,000 gross square feet (gsf) of new retail uses, including approximately 92,000 gsf of wholesale warehouse space, 67,000 gsf of supermarket space, 16,000 gsf of restaurant space, 50,000 gsf of destination retail space, approximately 1,000 gsf of gas

station and automated bank teller space, and 838 accessory parking spaces. The proposed project would result in approximately -63, 204, and 263 incremental vehicle trips when compared against the No Action development on the site during the weekday midday, PM, and Saturday peak hours, respectively. The incremental auto trips were assigned to the proposed project's parking spaces, and taxi trips were assigned to enter the project site and drop-off/pick-up along the project site's internal roadway. All delivery trips were assigned to the project site via NYCDOT-designated truck routes.

Traffic Operations

As part of the proposed project, the project's driveway facing South Avenue would become a signalized intersection, with all movements permitted. The northbound approach of South Avenue would have a left-turn only lane and two through lanes. The southbound approach of South Avenue would have a through lane and a shared through-right lane. The eastbound approach of the site driveway has been designed to maintain acceptable levels of service on all three approaches of the intersection. The proposed driveway and new traffic signal on South Avenue has been preliminarily designed for the worst-case peak hour traffic conditions projected to occur during a typical week—the Saturday peak hour. According to the traffic analysis, it will operate at overall acceptable conditions and on all three approaches for that worst-case analysis peak hour. The new driveway is located with acceptable spacing away from the signalized intersections to the north and south, and is on a straight, level section of South Avenue with good sight distance which provides good sight lines to the new traffic signal. Furthermore, the proposed signal's timing would be coordinated with NYCDOT to allow signal progression with upstream and downstream signals to maintain traffic flow, and also allow gaps so westbound traffic from Grandview Avenue would not be adversely affected. A signal warrant analysis has been performed to demonstrate that this intersection will warrant a new traffic signal.

The 2019 With Action condition traffic volumes are shown in **Figures 7-19 through 7-21** for the weekday midday, PM, and Saturday peak hours. The 2019 With Action traffic volumes were constructed by layering on top of the No Action condition traffic volumes the incremental vehicle trips shown in **Figures 7-2 through 7-4**. A summary of the 2019 With Action condition traffic analysis results is presented in **Table 7-16.** Details on level-of-service, v/c ratios, and average delays are presented in **Table 7-17 and Table 7-18**.

Table 7-16
Summary of 2019 With Action Condition Traffic Analysis Results

Level of Service	Analysis Peak Hours		
	Weekday Midday	Weekday PM	Saturday
Signalized Intersections			
Lane Groups at LOS A/B/C	36	35	29
Lane Groups at LOS D	7	5	10
Lane Groups at LOS E	1	2	2
Lane Groups at LOS F	1	3	4
Total Lane Groups	**45**	**45**	**45**
Lane Groups with v/c ≥ 0.90	2	7	10
Intersections at LOS A/B/C	8	7	7
Intersections at LOS D	1	1	1
Intersections at LOS E	0	1	0
Intersections at LOS F	0	0	1
Total Intersections	**9**	**9**	**9**
Unsignalized Intersections			
Lane Groups at LOS A/B/C	2	2	2
Lane Groups at LOS D	0	0	0
Lane Groups at LOS E	0	0	0
Lane Groups at LOS F	2	2	2
Total Lane Groups	**4**	**4**	**4**
Lane Groups with v/c ≥ 0.90	0	2	2

Notes:
LOS = Level-of-Service; v/c = volume-to-capacity ratio.

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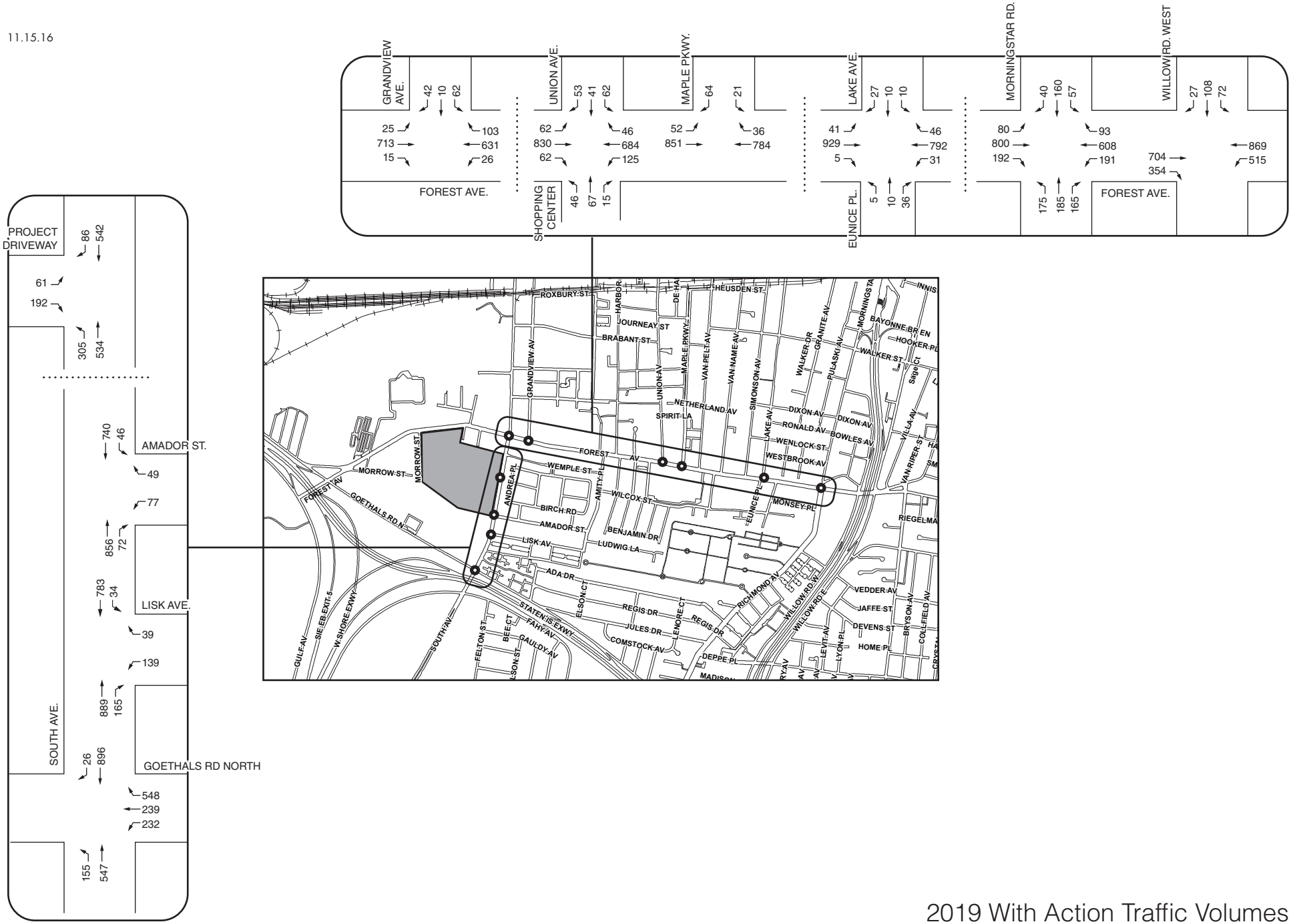

2019 With Action Traffic Volumes
Weekday Midday Peak Hour

South Avenue Retail Development

Figure 7-19

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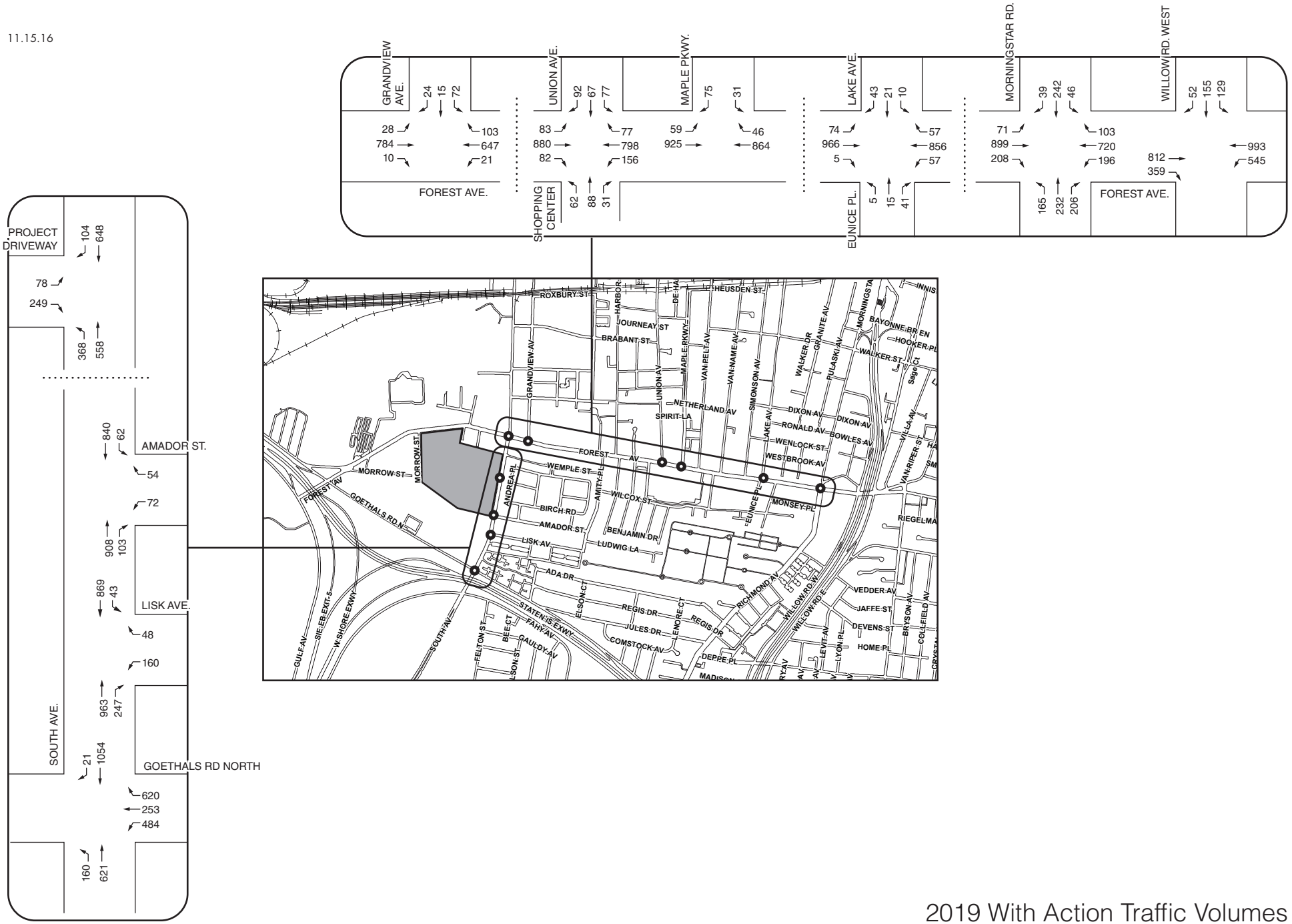

2019 With Action Traffic Volumes
Weekday PM Peak Hour

South Avenue Retail Development

Figure 7-20

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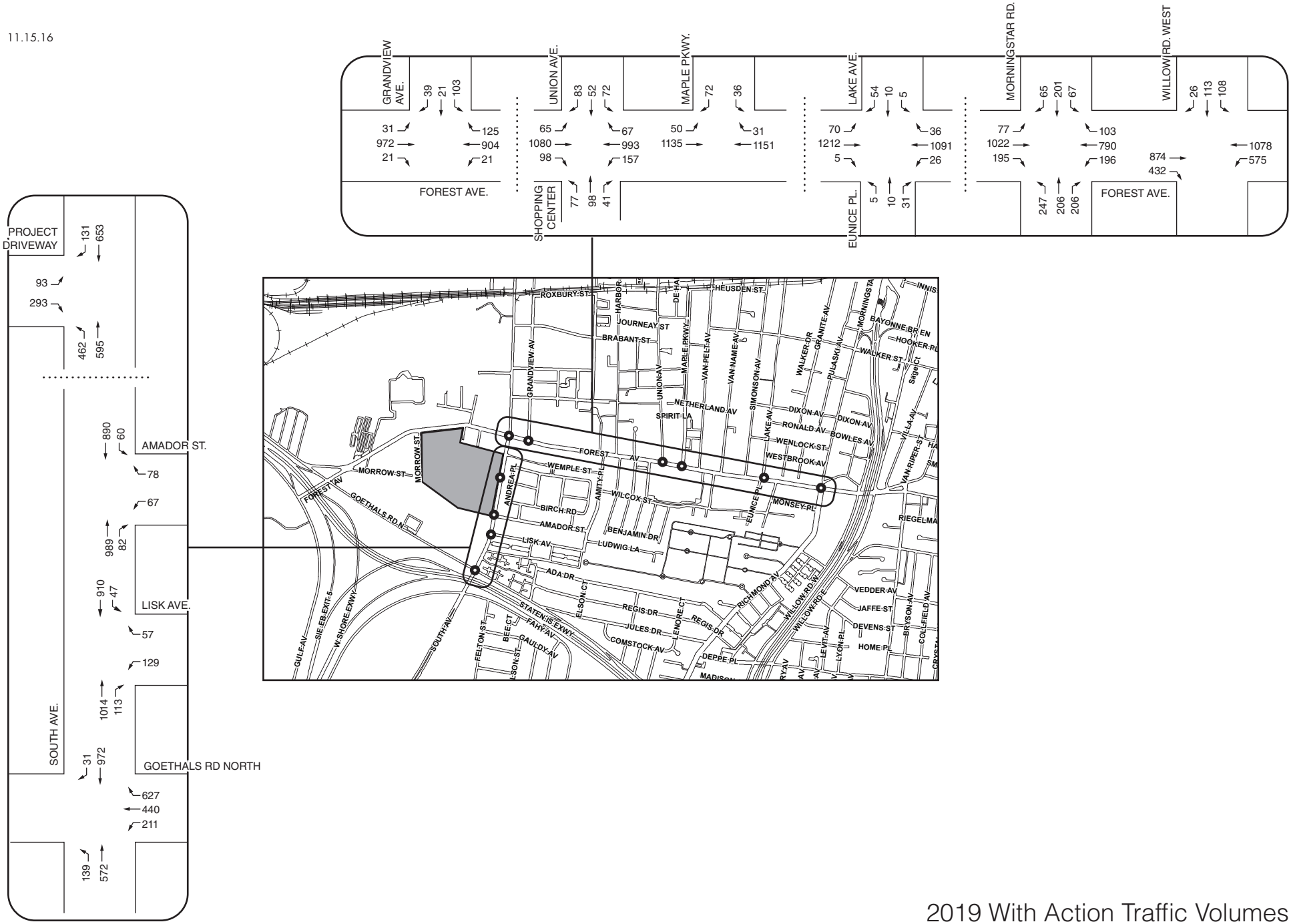

2019 With Action Traffic Volumes
Saturday Peak Hour
Figure 7-21

South Avenue Retail Development

Table 7-17
2019 No Action and With Action Condition Level of Service Analysis
Signalized Intersections

	Weekday Midday								Weekday PM								Saturday							
	2019 No Action				2019 With Action				2019 No Action				2019 With Action				2019 No Action				2019 With Action			
	Lane	v/c	Delay		Lane	v/c	Delay		Lane	v/c	Delay		Lane	v/c	Delay		Lane	v/c	Delay		Lane	v/c	Delay	
Intersection	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS
Forest Avenue @ Grandview Avenue																								
Eastbound	LTR	0.49	13.7	B	LTR	0.48	13.6	B	LTR	0.50	13.9	B	LTR	0.53	14.4	B	LTR	0.61	15.5	B	LTR	0.66	16.6	B
Westbound	L	0.13	11.0	B	L	0.12	11.0	B	L	0.11	10.9	B	L	0.12	11.1	B	L	0.14	11.7	B	L	0.16	12.2	B
	TR	0.43	13.0	B	TR	0.43	13.0	B	TR	0.44	13.0	B	TR	0.45	13.2	B	TR	0.62	15.7	B	TR	0.64	16.0	B
Southbound	LTR	0.27	22.6	C	LTR	0.27	22.6	C	LTR	0.25	22.3	C	LTR	0.25	22.3	C	LTR	0.34	23.6	C	LTR	0.35	23.7	C
	Intersection		14.1	B	Intersection		14.0	B	Intersection		14.1	B	Intersection		14.4	B	Intersection		16.2	B	Intersection		16.8	B
South Avenue @ Project Driveway																								
Eastbound					L	0.19	28.0	C					L	0.19	25.6	C					L	0.25	28.8	C
					R	0.56	35.1	D					R	0.56	32.4	C					R	0.75	42.7	D
Northbound	Unsignalized Intersection in 2019 No Action Condition				L	0.67	21.1	C	Unsignalized Intersection in 2019 No Action Condition				L	0.80	33.0	C	Unsignalized Intersection in 2019 No Action Condition				L	0.88	39.9	D
					T	0.56	11.3	B					T	0.69	16.0	B					T	0.63	12.6	B
Southbound					TR	0.79	36.3	D					TR	0.84	38.4	D					TR	0.90	44.3	D
					Intersection		25.9	C					Intersection		29.6	C					Intersection		34.1	C
Forest Avenue @ Maple Parkway																								
Eastbound	L	0.30	18.2	B	L	0.30	18.1	B	L	0.43	23.1	C	L	0.45	24.5	C	L	0.60	41.2	D	**L**	**0.65**	**46.7**	**D+**
Westbound	T	0.54	17.8	B	T	0.54	17.7	B	T	0.52	17.4	B	T	0.55	17.8	B	T	0.64	19.4	B	T	0.67	20.0	B
	TR	0.54	17.9	B	TR	0.54	17.8	B	TR	0.60	18.9	B	TR	0.61	19.1	B	TR	0.74	22.1	C	TR	0.75	22.5	C
Southbound	LR	0.16	17.2	B	LR	0.16	17.2	B	LR	0.19	17.6	B	LR	0.20	17.6	B	LR	0.18	17.5	B	LR	0.19	17.5	B
	Intersection		17.8	B	Intersection		17.8	B	Intersection		18.3	B	Intersection		18.6	B	Intersection		21.1	C	Intersection		21.7	C
Forest Avenue @ Richmond Avenue/Morningstar Road																								
Eastbound	L	0.52	35.2	D	L	0.52	35.1	D	L	0.51	35.9	D	L	0.53	37.3	D	L	0.65	146.5	F	**L**	**0.68**	**163.6**	**F+**
	TR	1.14	104.7	F	TR	1.12	100.3	F	TR	1.20	132.7	F	**TR**	**1.24**	**148.9**	**F+**	TR	1.28	199.8	F	**TR**	**1.32**	**220.4**	**F+**
Westbound	L	0.80	42.7	D	L	0.80	41.7	D	L	0.81	41.6	D	L	0.81	42.2	D	L	0.81	43.2	D	L	0.81	43.2	D
	TR	0.46	16.7	B	TR	0.46	16.6	B	TR	0.54	17.9	B	TR	0.55	18.0	B	TR	0.63	19.4	B	TR	0.64	19.5	B
Northbound	L	0.64	31.7	C	L	0.64	31.7	C	L	0.61	29.7	C	L	0.61	29.7	C	L	0.88	53.8	D	L	0.89	54.7	D
	T	0.32	19.8	B	T	0.32	19.8	B	T	0.35	20.3	C	T	0.35	20.3	C	T	0.35	20.2	C	T	0.35	20.2	C
	R	0.22	9.8	A	R	0.22	9.8	A	R	0.28	10.4	B	R	0.28	10.4	B	R	0.28	10.4	B	R	0.28	10.4	B
Southbound	LTR	0.84	50.4	D	LTR	0.84	50.4	D	LTR	0.89	55.8	E	LTR	0.89	55.8	E	LTR	1.00	79.6	E	LTR	1.01	81.6	F
	Intersection		54.7	D	Intersection		53.0	D	Intersection		64.5	E	Intersection		71.0	E	Intersection		93.0	F	Intersection		93.0	F
Forest Avenue @ Union Avenue																								
Eastbound	L	0.27	13.2	B	L	0.27	13.2	B	L	0.43	17.6	B	L	0.44	18.3	B	L	0.37	17.1	B	L	0.39	18.0	B
	TR	0.51	13.9	B	TR	0.50	13.8	B	TR	0.55	14.5	B	TR	0.58	15.0	B	TR	0.61	15.4	B	TR	0.64	15.9	B
Westbound	L	0.69	31.2	C	L	0.67	29.7	C	L	0.94	71.2	E	**L**	**1.02**	**95.6**	**F+**	L	1.29	191.1	F	**L**	**1.43**	**251.0**	**F+**
	TR	0.43	13.0	B	TR	0.43	12.9	B	TR	0.52	14.1	B	TR	0.53	14.2	B	TR	0.58	15.1	B	TR	0.59	15.2	B
Northbound	L	0.15	21.3	C	L	0.15	21.3	C	L	0.25	23.0	C	L	0.25	23.0	C	L	0.28	23.5	C	L	0.29	23.6	C
	TR	0.17	21.2	C	TR	0.17	21.2	C	TR	0.25	22.2	C	TR	0.25	22.2	C	TR	0.28	22.5	C	TR	0.28	22.5	C
Southbound	LTR	0.38	24.5	C	LTR	0.38	24.5	C	LTR	0.59	29.5	C	LTR	0.59	29.6	C	LTR	0.52	27.6	C	LTR	0.52	27.8	C
	Intersection		16.1	B	Intersection		16.0	B	Intersection		20.3	C	Intersection		22.0	C	Intersection		28.5	C	Intersection		32.3	C
Forest Avenue @ Willow Road West																								
Eastbound	TR	0.91	37.0	D	TR	0.90	36.1	D	TR	0.93	39.1	D	TR	0.96	44.0	D	TR	0.98	45.9	D	**TR**	**1.02**	**55.5**	**E+**
Westbound	DefL	0.56	17.4	B	DefL	0.56	17.3	B	DefL	0.48	15.1	B	DefL	0.48	15.5	B	DefL	0.52	17.5	B	DefL	0.51	18.1	B
	T	0.77	18.9	B	T	0.76	18.8	B	T	0.87	22.9	C	T	0.88	23.7	C	T	1.00	42.7	D	T	1.01	45.7	D
Southbound	L	0.17	24.7	C	L	0.17	24.7	C	L	0.32	27.6	C	L	0.32	27.6	C	L	0.28	27.0	C	L	0.28	27.0	C
	T	0.22	25.3	C	T	0.22	25.3	C	T	0.34	27.8	C	T	0.34	27.8	C	T	0.28	26.9	C	T	0.28	26.9	C
	R	0.08	23.7	C	R	0.08	23.7	C	R	0.16	25.5	C	R	0.16	25.5	C	R	0.09	24.5	C	R	0.09	24.5	C
	Intersection		26.6	C	Intersection		26.2	C	Intersection		28.1	C	Intersection		30.4	C	Intersection		38.2	D	Intersection		38.2	D
South Avenue @ Amador Street																								
Westbound	LR	0.39	31.3	C	LR	0.38	31.1	C	LR	0.37	30.8	C	LR	0.39	31.2	C	LR	0.42	31.9	C	LR	0.45	32.4	C
Northbound	TR	0.74	15.2	B	TR	0.84	20.3	C	TR	0.75	15.5	B	TR	0.91	26.2	C	TR	0.80	17.5	B	**TR**	**1.02**	**46.2**	**D+**
Southbound	LT	0.42	8.4	A	LT	0.41	8.3	A	LT	0.45	8.7	A	LT	0.50	9.2	A	LT	0.47	8.9	A	LT	0.53	9.7	A
	Intersection		13.4	B	Intersection		15.9	B	Intersection		13.4	B	Intersection		18.9	B	Intersection		14.6	B	Intersection		29.3	B
South Avenue @ Lisk Avenue																								
Westbound	LR	0.83	63.2	E	LR	0.82	61.7	E	LR	1.03	102.3	F	**LR**	**1.05**	**109.3**	**F+**	LR	0.89	72.2	E	**LR**	**0.92**	**77.4**	**E+**
Northbound	T	0.57	7.6	A	T	0.66	9.1	A	T	0.57	7.5	A	T	0.69	9.6	A	T	0.61	8.1	A	T	0.78	12.0	B
	R	0.12	4.0	A	R	0.12	4.0	A	R	0.16	4.2	A	R	0.16	4.2	A	R	0.08	3.8	A	R	0.08	3.8	A
Southbound	LT	0.40	5.4	A	LT	0.40	5.4	A	LT	0.43	5.6	A	LT	0.50	6.3	A	LT	0.44	5.7	A	LT	0.57	7.1	A
	Intersection		11.9	B	Intersection		12.2	B	Intersection		17.0	B	Intersection		18.2	B	Intersection		13.2	B	Intersection		15.6	B
South Av @ Goethals Road North																								
Westbound	LTR	0.82	32.9	C	LTR	0.82	33.2	C	LTR	1.03	62.8	E	**LTR**	**1.07**	**76.3**	**E+**	LTR	0.90	37.5	D	**LTR**	**0.98**	**48.7**	**D+**
Northbound	L	0.51	19.5	B	L	0.51	19.5	B	L	0.50	20.2	C	L	0.50	21.1	C	L	0.40	17.5	B	L	0.40	17.9	B
	T	0.59	15.7	B	T	0.59	15.7	B	T	0.60	15.7	B	T	0.60	15.9	B	T	0.63	16.3	B	T	0.64	16.6	B
Southbound	TR	0.85	35.6	D	TR	0.84	35.2	D	TR	0.95	45.5	D	TR	0.97	50.1	D	TR	0.87	36.8	D	TR	0.90	39.4	D
	Intersection		29.4	C	Intersection		29.3	C	Intersection		46.2	D	Intersection		53.7	D	Intersection		31.9	C	Intersection		37.6	D

Notes:
L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service; v/c = Volume to Capacity.
+ denotes significant adverse impact.

Table 7-18
2019 No Action and With Action Condition Level of Service Analysis
Unsignalized Intersections

	Weekday Midday								Weekday PM								Saturday							
	2019 No Action				2019 With Action				2019 No Action				2019 With Action				2019 No Action				2019 With Action			
	Lane	v/c	Delay		Lane	v/c	Delay		Lane	v/c	Delay		Lane	v/c	Delay		Lane	v/c	Delay		Lane	v/c	Delay	
Intersection	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS	Group	Ratio	(sec)	LOS
Forest Avenue @ Lake Avenue - Eunice Place																								
Eastbound	LTR	0.07	10.5	B	LT	0.07	10.5	B	LTR	0.13	11.5	B	LT	0.13	11.6	B	LTR	0.15	13.1	B	LT	0.15	13.2	B
Westbound	L	0.06	11.5	B	LT	0.06	11.5	B	L	0.11	11.3	B	LT	0.11	11.6	B	L	0.06	12.6	B	LT	0.07	12.9	B
Northbound	T	0.65	94.1	F	LTR	0.63	88.9	F	T	**	**	F	LTR	**	**	F^	T	**	**	F	LTR	**	**	F^
Southbound	TR	0.79	149.6	F	LTR	0.77	141.7	F	TR	2.20	760.5	F	LTR	3.03	1193.0	F^	TR	**	**	F	LTR	**	**	F^
South Avenue @ Project Driveway																								
Eastbound	R	0.33	13.2	B	Signalized Intersection in 2019 With Action Condition				R	0.36	13.9	B	Signalized Intersection in 2019 With Action Condition				R	0.43	15.0	C	Signalized Intersection in 2019 With Action Condition			

Notes:
L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service; v/c = Volume to Capacity; ** = Delay values not reported by the HCS model. ^ Denotes no significant adverse impact because there are fewer than 90 passenger car equivalents (PCEs) on minor street in peak hour.

Significant Adverse Impacts

Details on level-of-service, v/c ratios, and average delays are presented in **Table 7-17 and Table 7-18**. As discussed below, significant adverse traffic impacts were identified at eight approaches/lane groups (of seven different intersections). Potential measures that can be implemented to mitigate these significant adverse traffic impacts are discussed in Chapter 13, "Mitigation."

Forest Avenue

- Eastbound left-turn at the intersection of Forest Avenue and Maple Parkway would deteriorate within LOS D (from a v/c ratio of 0.60 and a delay of 41.2 spv to a v/c ratio of 0.65 and a delay of 46.7 spv) in the Saturday peak hour, an increase in delay of more than five seconds. This projected increase in delay constitutes a significant adverse impact;
- Eastbound left-turn at the intersection of Forest Avenue and Richmond Avenue/Morningstar Road would deteriorate within LOS F (from a v/c ratio of 0.65 and a delay of 146.5 spv to a v/c ratio of 0.68 and a delay of 163.6 spv) in the Saturday peak hour, an increase in delay of more than three seconds. This projected increase in delay constitutes a significant adverse impact;
- Eastbound through/right-turn at the intersection of Forest Avenue and Richmond Avenue/Morningstar Road would deteriorate within LOS F (from a v/c ratio of 1.20 and a delay of 132.7 spv to a v/c ratio of 1.24 and a delay of 148.9 spv) in the weekday PM peak hour, and within LOS F (from a v/c ratio of 1.28 and a delay of 199.8 spv to a v/c ratio of 1.32 and a delay of 220.4 spv) in the Saturday peak hour, increases in delay of more than three seconds. These projected delays constitute significant adverse impacts;
- Westbound left-turn at the intersection of Forest Avenue and Union Avenue would deteriorate from LOS E to LOS F (from a v/c ratio of 0.94 and a delay of 71.2 spv to a v/c ratio of 1.02 and a delay of 95.6) in the weekday PM peak hour, and within LOS F (from a v/c ratio of 1.29 and a delay of 191.1 spv to a v/c ratio of 1.43 and a delay of 251.0 spv) in the Saturday peak hour, increases in delay of more than four seconds and more than three seconds, respectively. These projected delays constitute significant adverse impacts;
- Eastbound approach at the intersection of Forest Avenue and Willow Road West would deteriorate from LOS D to LOS E (from a v/c ratio of 0.98 and a delay of 45.9 spv to a v/c

ratio of 1.02 and a delay of 55.5 spv) in the Saturday peak hour, an increase in delay of more than five seconds. This projected delay constitutes a significant adverse impact;

South Avenue

- Northbound approach at the intersection of South Avenue and Amador Street would deteriorate within LOS E (from a v/c ratio of 0.89 and a delay of 72.2 spv to a v/c ratio of 0.92 and a delay of 77.4 spv) in the Saturday peak hour, an increase in delay of more than four seconds. This projected delay constitutes a significant adverse impact;

Lisk Avenue

- Westbound approach at the intersection of South Avenue and Lisk Avenue would deteriorate within LOS F (from a v/c ratio of 1.03 and a delay of 102.3 spv to a v/c ratio of 1.05 and a delay of 109.3 spv) in the weekday PM peak hour, and within LOS E (from a v/c ratio of 0.89 and a delay of 72.2 spv to a v/c ratio of 0.92 and a delay of 77.4 spv) in the Saturday peak hour, increases in delay of more than three seconds and four seconds, respectively. These projected delays constitute significant adverse impacts; and

Goethals Road North

- Westbound approach at the intersection of South Avenue and Goethals Road North would deteriorate within LOS E (from a v/c ratio of 1.03 and a delay of 62.8 spv to a v/c ratio of 1.07 and a delay of 76.3 spv) in the weekday PM peak hour, and within LOS D (from a v/c ratio of 0.90 and a delay of 37.5 spv to a v/c ratio of 0.98 and a delay of 48.7 spv) in the Saturday peak hour, increases in delay of more than four seconds and five seconds, respectively. These projected delays constitute significant adverse impacts.

D. VEHICULAR AND PEDESTRIAN SAFETY EVALUATION

METHODOLOGY

An evaluation of vehicular and pedestrian safety is necessary for locations within the traffic and pedestrian study areas that have been identified as high crash locations, where 48 or more total reportable and non-reportable crashes or five or more pedestrian/bicyclist injury crashes occurred in any consecutive 12 months of the most recent 3-year period for which data are available. For these locations, crash trends are identified to determine whether projected vehicular and pedestrian traffic would further impact safety at these locations. The determination of potential significant safety impacts depends on the type of area where the project site is located, traffic volumes, crash types and severity, and other contributing factors. Where appropriate, measures to improve traffic and pedestrian safety are identified and coordinated with NYCDOT.

CRASH DATA

Crash data for the study area intersections were obtained from NYSDOT for the time period between August 1, 2013, and July 31, 2016. The data obtained quantify the total number of reportable crashes (involving fatality, injury, or more than $1,000 in property damage), fatalities, and injuries during the study period, as well as a yearly breakdown of vehicular crashes with pedestrians and bicycles at each location.

During the August 1, 2013 and July 31, 2016 three-year period, a total of 210 reportable and non-reportable crashes, zero fatalities, 224 injuries, and 35 pedestrian/bicyclist-related crashes occurred at the study area intersections. A rolling total of crash data identifies zero high crash locations in the 2013 to 2016 period. **Table 7-19** depicts total accident characteristics by intersection during the study period, as well as a breakdown of pedestrian and bicycle accidents by year and location. A rolling total of crash data identifies zero high crash locations in the 2013 to 2016 period. Therefore, the proposed project would not result in the potential for any significant adverse pedestrian safety impacts.

Table 7-19
Accident Summary

Intersection		Study Period						Accidents by Year							
North-South Roadway	East-West Roadway	All Accidents by Year				Total Fatalities	Total Injuries	Pedestrian				Bicycle			
		2013	2014	2015	2016			2013	2014	2015	2016	2013	2014	2015	2016
South Avenue	Edward Curry Ave	0	1	0	0	0	1	0	0	0	0	0	0	0	0
South Avenue	Lois Lane	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Avenue	Fahy Avenue	2	3	3	1	0	16	0	0	0	0	0	0	0	0
South Avenue	Goethals Rd N	1	8	3	3	0	16	0	0	0	0	0	0	0	0
South Avenue	Regal Walk	1	0	0	0	0	0	0	0	0	0	0	0	0	0
South Avenue	Wolkoff Lane	1	0	0	1	0	3	0	0	0	0	0	0	0	0
South Avenue	Leon Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Avenue	Lisk Avenue	0	2	0	0	0	1	0	0	0	0	0	0	0	0
South Avenue	Amador Street	0	2	2	2	0	6	0	0	0	1	0	0	0	0
South Avenue	Wemple Street	1	1	0	1	0	3	0	0	0	0	0	0	0	0
South Avenue	Forest Avenue	5	7	7	2	0	20	1	2	0	0	0	0	0	0
South Avenue	Netherland Avenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Avenue	Cable Way	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Avenue	Continental Place	0	2	3	0	0	5	0	0	0	0	0	0	1	0
South Avenue	Brabant Street	1	4	2	0	0	7	0	3	0	0	0	0	0	0
South Avenue	Arlington Place	0	1	1	0	0	1	0	0	0	0	0	0	1	0
Gulf Avenue	Forest Avenue	0	1	0	0	0	1	0	0	0	0	0	0	0	0
Goethals Road N	Forest Avenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morrow Street	Forest Avenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elizabeth Grove Rd	Forest Avenue	1	0	1	0	0	0	0	0	0	0	0	0	0	0
Dwarf Street	Forest Avenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northfield Avenue	Forest Avenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lilac Court	Forest Avenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grandview Avenue	Forest Avenue	0	4	3	2	0	10	0	1	1	1	0	0	0	0
Samuel Place	Forest Avenue	0	1	0	0	0	1	0	0	0	0	0	0	0	0
Amity Place	Forest Avenue	1	3	2	0	0	2	1	0	0	0	0	1	0	0
Harbor Road	Forest Avenue	0	3	2	2	0	9	0	0	0	0	0	0	0	0
Summerfield Place	Forest Avenue	0	0	1	0	0	1	0	0	0	0	0	0	1	0
Bruckner Avenue	Forest Avenue	0	1	0	0	0	2	0	0	0	0	0	0	0	0
Heaney Avenue	Forest Avenue	0	1	0	0	0	1	0	0	0	0	0	0	0	0
Union Avenue	Forest Avenue	1	2	3	2	0	10	0	1	0	0	0	1	0	0
Maple Parkway	Forest Avenue	2	3	1	2	0	8	1	2	1	0	0	0	0	0
Van Pelt Avenue	Forest Avenue	0	2	2	0	0	4	0	0	0	0	0	0	0	0
Van Name Avenue	Forest Avenue	2	4	3	1	0	13	0	0	0	0	0	0	0	0
Simonson Avenue	Forest Avenue	0	1	2	0	0	3	0	0	0	0	0	0	0	0
Lake Avenue	Forest Avenue	0	0	2	0	0	2	0	0	0	0	0	0	0	0
Eunice Place	Forest Avenue	0	0	4	0	0	10	0	0	0	0	0	0	0	0
Sanders Street	Forest Avenue	0	4	1	1	0	5	0	1	0	0	0	0	0	0
Richmond Avenue	Forest Avenue	7	11	14	7	0	40	3	2	3	1	0	0	0	0
Morningstar Road	Forest Avenue	1	0	1	0	0	1	1	0	0	0	0	0	0	0
Willow Road W	Forest Avenue	2	8	5	6	0	22	0	0	1	2	0	0	0	0

Source:
NYSDOT August 1, 2013 through July 31, 2016 accident data.
Note:
Bold intersections are high accident locations.

E. PARKING ASSESSMENT

The proposed project would include 838 accessory parking spaces within the Project Site. In the With Action condition, as shown in **Table 7-20**, a maximum of 489 and 593, or 58 percent and 71, percent of accessory parking spaces in the Project Site would be utilized in the peak weekday and Saturday parking hours, respectively. Because the on-site accessory parking utilization levels are within the proposed project's parking capacity, a detailed on-street and off-street parking analysis is not warranted, and the proposed project is not expected to result in the potential for a parking shortfall or significant adverse parking impacts.

Table 7-20
2019 With Action Condition Parking Demand and Utilization

	Weekday					Saturday				
Hour	In	Out	Total	Parking Demand	Parking Utilization	In	Out	Total	Parking Demand	Parking Utilization
12 AM–1 AM	0	0	0	0	0%	0	0	0	0	0%
1 AM–2 AM	0	0	0	0	0%	0	0	0	0	0%
2 AM–3 AM	0	0	0	0	0%	0	0	0	0	0%
3 AM–4 AM	0	0	0	0	0%	0	0	0	0	0%
4 AM–5 AM	0	0	0	0	0%	0	0	0	0	0%
5 AM–6 AM	0	0	0	0	0%	0	0	0	0	0%
6 AM–7 AM	7	0	7	7	1%	9	0	9	9	1%
7 AM–8 AM	168	131	299	44	5%	106	36	142	79	9%
8 AM–9 AM	218	175	393	87	10%	209	149	358	139	17%
9 AM–10 AM	299	224	523	162	19%	340	235	575	244	29%
10 AM–11 AM	352	249	601	265	32%	412	301	713	355	42%
11 AM–12 PM	441	360	801	346	41%	453	404	857	404	48%
12 PM–1 PM	648	611	1,259	383	46%	516	508	1,024	412	49%
1 PM–2 PM	546	480	1,026	449	54%	794	693	1,487	513	61%
2 PM–3 PM	508	574	1,082	383	46%	656	625	1,281	544	65%
3 PM–4 PM	561	535	1,096	409	49%	587	548	1,135	583	70%
4 PM–5 PM	586	606	1,192	389	46%	649	639	1,288	593	71%
5 PM–6 PM	660	619	1,279	430	51%	548	616	1,164	525	63%
6 PM–7 PM	592	533	1,125	489	58%	498	526	1,024	497	59%
7 PM–8 PM	464	537	1,001	416	50%	402	503	905	396	47%
8 PM–9 PM	282	434	716	264	32%	296	374	670	318	38%
9 PM–10 PM	177	340	517	101	12%	160	320	480	158	19%
10 PM–11 PM	59	120	179	40	5%	79	165	244	72	9%
11 PM–12 AM	19	59	78	0	0%	20	92	112	0	0%
				489	**58%**				**593**	**71%**

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