

OPERATIONS PLAN

1045 & 1031 5th Street, 527 & 543 Lenox Avenue,
Miami Beach, Florida

Planning Board: Final Submittal August 10, 2016

Conditional Use Permit for retail building in excess of 50,000 square feet

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OVERVIEW

Property. The Property is located along the major 5th Street corridor. It is comprised of approximately 43,500 square feet (roughly 1 acre) located at the northeast corner of the intersection of Lenox Avenue and 5th Street. The Property is located within the Ocean Beach Historic District and is zoned C-PS2, Commercial Performance Standard, General Mixed-use Commercial (“C-PS2”), a zoning district allowing a wide range of commercial uses as a main permitted use. The Property is currently improved with two buildings, neither of which are listed as “contributing” buildings in the City’s Historic Properties Database. The building at 1045 5 Street operates as a nightclub and the building at 1031 5 Street contains commercial uses.

Proposed Development Program. The Applicants propose a 4-story development on the Property consisting of multiple retail bays with structured parking. The first two (2) levels of the structure will serve as solely retail, except for ramps at the north and east to access internal parking. The third level will have retail along the south and west and parking in the interior. There will be two (2) additional levels of parking on the fourth floor and the rooftop level, which is open-air. The majority of the parking fronting each of 5th Street and Lenox Avenue will be lined with retail uses and the remaining will be screened with decorative design features.

ACCESS

The Proposed Development will have pedestrian access all along 5th Street and Lenox Avenue, with vehicular access to the parking garage at the northern end of the Property on Lenox Avenue. The parking will be self-parking using an electronic ticketing and payment system at the entrance and exit; there will not be any valet. Also, there will not be any tandem parking spaces or mechanical lifts. The core area for the stairs and elevator will be at the southwest corner of the Property providing access to and from retail bays and the internal parking.

Loading and trash collection will take place through the one-way alley at the east side of the Property. The loading area will be entirely within the private property. Loading and trash collection activities will take place between 7:00 AM and 5:00 PM. All trucks will drive north on the alley and back into the designated spaces and then pull forward onto the alley to continue north to reach their next destination.

STAFFING LEVELS

Like other area retail uses in the City, each business will hire the necessary employees to manage their operations and will be generally be open throughout the day and evening to serve their customers.

Property management will provide staff that will manage loading and trash collection operations and general upkeep and maintenance of the facility.

SECURITY

Security will be provided through a combination of security cameras and limited roving security officers. It is anticipated that some retail tenants will provide their own security and the property management will work with all tenants to supplement security as needed.

SOUND

The Applicants propose an off-street loading and trash collection area located on the east side adjacent to the alley. This internal ground floor area is completely covered by the building above and will serve to buffer noise and visual impacts.

PARKING

The Proposed Development will have three (3) levels of parking. The structure will offer 216 parking space on-site, where the required parking for the development is 216 parking spaces.

Access to the parking garage will be at the northern portion of the Property along Lenox Avenue. The parking garage will be for self-parking, serviced by a ticket machine at the entrance and exit for payment; there will not be any valet operation or tandem spaces or mechanical lifts.

BICYCLE PARKING

There will be 40 bicycle parking spaces provided for the public and employee use. 20 spaces will be provided at the ground level on 5th Street by the retail uses and 20 spaces will be provided inside the 3rd level parking garage.

DELIVERIES AND COLLECTIONS

The Applicants will utilize the alley along the eastern side of the Property for loading and trash collection. The actual loading and trash collection will take place at an internalized on-site loading area with all 5 required loading spaces. For trash collection, the facility will have an enclosed, air conditioned trash compactor on the loading dock that will be serviced directly by the waste hauler. Deliveries and trash collection will be scheduled as needed between 7:00 AM and 5:00 PM, seven (7) days per week.

Delivery trucks will access the five (5) loading bays and the waste hauler will access the trash compactor from the one-way alley by driving north from 5th Street and backing into the loading spaces, then driving forward to leave. These bays are entirely enclosed inside the Property and off of the right-of-way. The provision of off-street loading will serve to mitigate the impact of new commercial uses.

Property management will provide staff to oversee deliveries and trash collections to ensure proper operations and no adverse impact to the surrounding area.

Owner O. E. Seiler

Mailing Address

Permit No. 7096

Lot 12 Block 98

Subdivision O.B. #3

No. 527- Street Lenox av.

Date June 26-1935

General Contractor Riley Construction Co.,

Address

Architect T. Hunter Henderson

Address

Front 30.8 Depth 30.8 Height

Stories 2

Use 2- family house

Type of construction cem blocks Cost \$5,000.00

Foundation reinf. concrete Roof B

Plumbing Contractor H. March

#8221

Address

Date June 28-'35

No. fixtures 9 Gas 4 Rough approved by

Date

Plumbing Contractor

Address

Date

No. fixtures set

Final approved by

Date

Sewer connection 1

Septic tank

Make

Date

Electrical Contractor Lowry

5407

Address

Date July 16-1935

No. outlets Heaters Stoves Motors 2

Fans

Temporary service

Rough approved by Receptacles 32;

Date

Electrical Contractor Lowrey

5498

Address

Date Aug. 19-1935

No. fixtures set 12

Final approved by

Date

Date of service

Alterations or repairs

Date

PLUMBING PERMIT # 20143 - Youngblood Roofing Co: 1 Solar water heater - June 22, 1946

PLUMBING PERMIT # 19937.....Serota..... 1 water closet, 1 lavatory, 1 shower, lower apt bath room only.....7-9-46

PLUMBING PERMIT# 30763 I. Markowitz Plumbing Service: 1 water closet, 1 lavatory, 1 bath tub, 1 sink, 1 gas range, 1 gas refrigerator outlet - Nov. 20, 1950 Final Plbg. 12/29/50 J. Zashick

BUILDING PERMIT # 34612 Remodeling for three apartments-new steel stairs to have closed risers & treads or concrete stairs-Escot Constr.Co. \$ 700....Dec. 14, 1950

BUILDING PERMITS: #49632 Chastain Fence Company: 259 lineal feet galvanized wire fence \$ 493.00
January 19, 1956
#65048 Youngblood Roofing Co.: Reroof - \$200. - June 6, 1961
#70867 Foldown Awnings, Inc.: 8' x 14½ over entrance hurricane folddown awning - \$400. - 1/6/64
#81479 Youngblood Co., Inc. Re-roof 14 Square's. \$490.00 / 2/2/68

ELECTRICAL PERMITS

#65199 Bennett Elect. Co.: 1 motor 0-1 hp., 1 motor 1½ hp., 1 service-equip., violation 100A - 10/30/67

PLUMBING PERMITS: #62310 11/4/85 Serota Plumbing 1' gas piping

M B Home & TRAINING School FOR RETARDED CHILDREN
Owner SAMUEL OLONOFF Mailing Address SUN RAY COURT APARTMENTS Permit No. 10127
Lot 14 & Block 98 Subdivision Ocean Beach No. 543 Street Lenox ave. Date July 28-1937
13 No. 3
General Contractor Pollock Construction Co. Address 4203-09-785
Architect Pamorrow Turner Address APARTMENT HOUSE
Front 30 Depth 140 Height 3444 Stories 1 Use 9 UNITS & 1 office
Type of construction c/b/s/ Cost \$ 21,500.00 Foundation spread footing Roof Tile
Certificate of occupancy # 69

Plumbing Contractor Fixzit #10259 Address Date July 30-1937

No. fixtures 41 Rough approved by GAS OK JJ Farrey - Oct. 27th-1937 Date

~~No. Receptacles~~ Gas 18

Plumbing Contractor

No. fixtures set Final approved by Date

Sewer connection -- 1 -- Septic tank Make Date

METRO ORD. #75-34
RECERTIFICATION DATE: 6/19/79

Electrical Contractor Griffin Electric Company # 9146 Address Date Aug. 16-1937

No. outlets 47 Heaters Stoves Motors Fans Temporary service - SAW-July 29-1937
66 Receptacles 43 Refrig. 9 Griffin- # 9045
Rough approved by Centers 18 Date

Electrical Contractor Griffin Electric Co. # 9495 Address Date Oct. 6-1937

No. fixtures set 66 - Lights 66 Final approved by Lincoln Brown, Jr. Date

Date of service October 19-1937 #9657-Griffin- 24 fixtures- Oct. 23-1937

Alterations or repairs # 14299- Storage room and bath \$ 500. Date July 11-1940
Triangle Construction Co. contractor: E.A. Nolan, architect

Electrical # 15328- Ideal Electric- 3 switch, 2 light outlets - 2 receptacles; 7-26-1940

BUILDING PERMIT # 18006... Painting... outside... B. Fox, painter... \$ 450: Jan. 26, 1944

PLUMBING PERMIT # 17518.... Herman March.... Replace 1 gas range..... March 24, 1944.....

PLUMBING PERMIT # 19571-... Pitsch-..... 1 water closets, 1 lavatory 1 bath tub..... 4-1-46

BNILDING PERMIT # 22245 - Platform for 6 garbage cans - Owner

\$ 100.... April 1, 1946

44330 L. & N Construction Company: ROOFING:

\$ 1800: April 15, 1954

#67773 Owner: remove partition to make one large room - \$200.00 - 8/3/62

#14030-Owner-Repairs to comply with Metro Orde.#75-34 -\$2000-10-17-78

#15123-Repair floors-under engineers supervision DeFillipo-\$500-6-7-79

#27754 12/9/85 Bellavia Const - new paint job 21-B, minor soffitt repair \$7,500.

PLUMBING PERMIT # 35114 Economy Plumbing Co: 1 Gas water heater: 7/17/1953

35182 N & R Plumbing Co: 1 Gas Water Heater: Aug 3, 1953 OK, E. Cox, 8-3-53

6/16/81 - #59579 - Peoples Gas System - 1 gas meter set - \$5.00

ELECTRICAL PERMITS: #82838 - Alpha to Omega Electric - 10 Smoke detectors - 2-5-88

3446 (See Original) 1101 - 3 - 5 to 1019
LOT 7+8 BLOCK 104 SUBDIVISION Ocean Beach ADDRESS 5th St
ALTERATIONS & ADDITIONS 1019-5th St

Building Permits:

6/8/81 - #20373 - Owner/Bauer - Ornamental Iron-work (mounted on window & door frames - 1st flr.) - \$2,000.00

Plumbing Permits:

Electrical Permits: #81144 6/20/86 Holbert Elec - repair

SHAW BROTHERS
 Owner H. Katzman Mailing Address
 Lot 9 Block 98 Subdivision McGuire's SUB
 General Contractor Owner Lots 6- 11 - Block 98
 Architect Ocean beach #3
 3449
 Front 31-4 Depth 37-6 Height
 Type of construction Block stucco Cost \$ 5,000.00
 Permit No. 1877
 No. 1031¹⁰³⁷ Street 5th Street Date June 17-1926
 Address
 Address
 Stories Use GASOLINE FILLING STATION
 Foundation Reinf. concrete Roof Tile

Plumbing Contractor Cooper Address Date July 7-1926
 No. fixtures 4 Rough approved by Date

No. Receptacles
 Plumbing Contractor Address Date
 No. fixtures set Final approved by Date
 Sewer connection 1 - Cooper Septic tank Make Date 7-7-1926

Electrical Contractor Everglades Electric Company Address Date Aug. 10-1926
 No. outlets Heaters Stoves Motors Fans Temporary service
 Rough approved by Fixtures #21 Date
 Electrical Contractor Address Date
 No. fixtures set Final approved by Date
 Date of service

Alterations or repairs # 8410 - Replacing 1,000 gal tank with one 550 gal and connecting to one 550 gal tank already in the ground Date
 \$ 100.00 June 27-1936

BUILDING PERMIT # 11442- 1 sign 36" dia. PURE OIL CO.- Owner - \$ 50.00- Aug. 12-1938

BUILDING PERMIT # 15062- Painting - Sey Construction Company - \$ 200.- Nov. 14-1940
 ELECTRICAL PERMIT # 16279 - UNITY ELECTRIC CO. - 15 Fixtures - 3 Motors, 0-1 HP Nov- 24-40
 PLUMBING PERMIT # 15029- W.J. Harper- 1 grease trap- 2-3-1941

SCHEER - 1031 5th street:
BUILDING PERMIT # 16154- Plastering, painting, - no addition - Pfeiffer & Pitt, architect:
A. Kaplan, contractor: \$ 1,000: Sept. 22, 1941

Pagoda Restaurant-# 16351- 1 Pole sign- Neon Sign & Service- \$ 200:- Oct. 27, 1941 -----

Steinhart # 22322 Removing overhanging roof -- S & M Contracting Co. \$ 250... Oct. 1, 1946

ACE U DRIVE IT # 25913 Pole sign on owner's property - Tropicalites- \$ 200..... Nov. 3, 1947

ACE U DRIVE IT # 27647 One 2,000 gallon gasoline tank and remove on 250 gallon tank- Texas Oils Company
\$ 300.... June 24, 1948

ACE U DRIVE IT # 35551 Flat wall sign - Colorescent, contr. \$ 400... April 11, 1951

ACE U DRIVE IT # 38443 Remodeling store front- Owner \$ 350... May 12, 1952

" " " # 38521 air conditioning - 3 ton-Seaboard Air Condition, Inc. \$ 1,400... May 21, 1952

1031 F
PLUMBING PERMIT # 15965- Schweitzer- 1 sink, 1 drinking fountain. 2 grease traps, 2 floor drains,
1 steam table, 1 gas range, 1 gas water heaters - Oct. 8, 1941 -

#75359 Gelfand Roofing Co.. Reroof - \$1,200. - 11/29/65

#80664 Charles Painting Co. Exterior Painting \$50.00 7/19/68 OK 9/16/68

#1151 - Service Station Maint. - underground tanks - 1-2,000 gal 6/11/70

ST XOVN37 - HW E 11/17/41

ELECTRICAL # 17674- State Electric- 10 fixtures- 3 fan outlets- 9-25, 41 *Final -Brown 11-25th SCHEER

"# 17843- Pagoda Restaurant) Neon Sign & Service- 2 neon transformers- Oct. 27, 1941

20929 Lyon Electric: 2 motors Feb. 26, 1945

22061-Martin-6 switch outlets, 18 light outlets, 16 receptacles, 1 motors. 2 centers of dis-
Final -Woodmansee 2/18th tribution 1 service-equipment-----1-20-46

22170-Tropicalites-4 Neon Transformers-----2-11-46

1031 5th Street: # 25136 Tropicalites -- 2 neon transformers, Nov. 3, 1947

1031 5th Street # 26328 Angler Electric: violations - May 19, 1948

1031 5th Street: # 33851 Colorescent Neon: 3 Neon transformers, April 11, 1951

1031 5th Street # 34440 Myers Electric: 1 motor - July 10, 1951 - H.O. Rosser 7/16/51

1031 Fifth St. # 36630 A & M Electric Co. Inc.: 1 motor - May 28, 1952

1031 Fifth Street # 36687 A & M Electric: 1 Motor, June 6, 1952

Owner	JULIUS STEINHARDT		Mailing Address	Permit No.	21071	Cost	\$ 10,000:
Lot	9	Block 98-OCEAN BEACH	Subdivision	McGUIRE'S	Address	1035	5th street
General Contractor	Sey Construction Company			Bond No.	3091	Engineer	
Architect	Jos. J. DeBrita			Lot Size	50 X 140	Height	14'
Zoning Regulations:	Use	BB	Area	19	Stories	one	
Building Size:	Front	50'	Depth	117'	Use	STORAGE GARAGE	
Certificate of Occupancy No.							
Type of Construction	#2 CBS	Foundation	Spread footing	Roof	Tile	Date	Oct. 23, 1945
Plumbing Contractor			Sewer Connection			Date	
			Temporary Closet			Date	
Plumbing Contractor						Date	
Water Closets	Bath Tubs		Floor Drains				
Lavatories	Showers		Grease Traps				
Urinals	Sinks		Drinking Fountains				
Gas Stoves	Gas Heaters		Rough Approved			Date	
Gas Radiators	Gas Turn On Approved						
Septic Tank Contractor			Tank Size			Date	
Oil Burner Contractor			Tank Size			Date	
Sprinkler System							
Electrical Contractor	# 22050-Martin	Address			Date	1-18-46	
Switch	2	Range	Motors	Fans	Temporary Service		
OUTLETS	Light 14	HEATERS	Water	Centers of Distribution	2		
	Receptacles 7		Space	Service-equipment	1		
		Refrigerators		Sign Outlets			
		Irons					
No. FIXTURES	14 --- 18,	Electrical Contractor	J.J. Martin			Date	Feb. 19, 1946
FINAL APPROVED BY	R.B. Woodmansee	Date of Service	Feb. 20, 1946				

Alterations or Repairs—Over

ELECTRICAL PERMIT # 23664 Elder Electric: 1 motor, Jan. 4, 1947

ALTERATIONS & ADDITIONS

Building Permits:

#02544-Wepco Construction-Re-roof 5000 sq.ft.-\$4000-2-14-73

Plumbing Permits:

Electrical Permits:

#70893-C.J. Kgy Electric Co.- 4 switch outlets; 4 light outlets; 10 receptacles; 100 service-10-17-73

COASTAL CONTROL ZONE
CUMULATIVE COST OF CONSTRUCTION OF PERMITS ISSUED

DATE	PROCESS	DESCRIPTION	WORK	CUMULATIVE	APPRAISED BLDG.		BUILDING
DEPARTMENT OF PLANNING 3450 TO: PAUL GIOIA BUILDING DIRECTOR FROM: JUD KURLANCHEEK ^(K) PLANNING AND ZONING DIRECTOR SUBJECT: FILE NO. 1586 CLUB/ RESTAURANT 1045 FIFTH STREET CITY HALL 1700 CONVENTION CENTER DRIVE TELEPHONE: 673-7550 June 20, 1989 Eug JAM JUN 23 1989							
ISSUED							PERMIT NO.
At the June 13, 1989 meeting, the Design Review Board granted final approval of the above noted project subject to the following conditions: 1. The existing green buttonwood trees shall be retained on Fifth Street. The applicant will discuss pruning techniques with the City's Public Works Department. 2. Plans shall note full irrigation of landscaped areas. 3. A complete site lighting plans shall be submitted to staff for review and approval. 4. It is recommended that the height of the wall surrounding the parking lot be reduced from five (5) to four (4) feet to provide better visibility. 5. It is recommended that the parking lot entrance and exit to the parking lot be limited to the Lenox Avenue side. In order to ensure that the appropriate staff is aware of these requirements, please record this action on the building card for the subject property. If the building permit is not issued within one (1) year of the meeting date (June 13, 1989) Design Review Board approval will become void. Thank you for your assistance in this matter. JK/JD drblet\mbclbpg							

69 JUN 23
 CITY OF MA
 BUILDING DEPT



*Traffic Impact Analysis
for Submittal to the
City of Miami Beach*

5th Street and Lenox Avenue
Retail Development
City of Miami Beach, Florida



Kimley»Horn

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July 2016
043770000

*Traffic Impact Analysis
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**5th Street and Lenox Avenue
Retail Development
Miami Beach, Florida**

Prepared for:

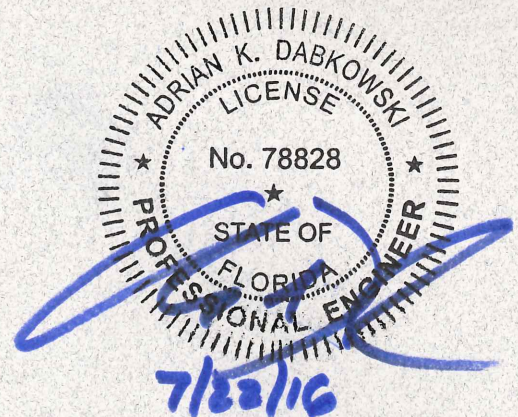
MAC 1045 5th Street, LLC
Miami Beach, Florida

Prepared by:

Kimley-Horn and Associates, Inc.

Kimley»Horn

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July 2016
043770000



Adrian K. Dabkowski, P.E., PTOE
Florida Registration Number 78828
Kimley-Horn and Associates, Inc.
600 North Pine Island Road, Suite 450
Plantation, Florida 33324
CA # 00000696

EXECUTIVE SUMMARY

MAC 1045 5th Street, LLC is proposing to redevelop the parcel located on the northeast quadrant of the intersection of 5th Street and Lenox Avenue in Miami Beach, Florida. The existing parcel consists of a 5,568 square-foot car rental facility and a 9,812 square-foot night club. The proposed redevelopment consists of a 66,100 square-foot retail facility and a self-park parking garage. The project is expected to be completed and opened by year 2018.

The 5th and Lenox redevelopment will be served by one (1) right-in/right-out driveway providing access to the parking garage located on the east side of Lenox Avenue between 5th Street and 6th Street. Two (2) Citibike stations with 16 bicycle docks each are located adjacent to the project site on the east side of Lenox Avenue between 6th Street and 7th Street and on the west side of Michigan Avenue between 5th Street and 6th Street.

An intersection capacity analysis was conducted at all study intersections. The results indicate that the study intersections are expected to operate at adopted levels of service (LOS D+20 or better) during the P.M. peak hour under all analysis conditions.

A turn lane queuing analysis was conducted for all exclusive turn lanes at study intersections. The results of the analysis indicate that all queues are expected to be accommodated within the existing turn lanes at all study intersections with the exception of the following:

- 5th Street and Alton Road – Northbound left-turn lane under existing, future background, and future total conditions. Please note that the proposed redevelopment does not assign project traffic to this movement.
- 5th Street and Michigan Avenue – Eastbound left-turn lane and southbound right-turn lane under existing, future background, and future total conditions. Please note that the project does not assign project traffic to the eastbound left-turn movement. Please note that the southbound right-turn lane is constrained due to a Citibike station and on-street parking.

An entry gate analysis was conducted for the project's parking garage entrance along Lenox Avenue between 6th Street and 5th Street. The results indicate that the 90th percentile queue length for the entry lanes is less than one (1) vehicle behind the service position during the P.M. peak hour. The proposed site entrance provides storage to accommodate one (1) vehicle behind the service position. Therefore, all anticipated queues are expected to be accommodated on-site without extending onto Lenox Avenue.

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INTRODUCTION

MAC 1045 5th Street, LLC is proposing to redevelop the parcel located on the northeast quadrant of the intersection of 5th Street and Lenox Avenue in Miami Beach, Florida. The existing parcel consists of a 5,568 square-foot car rental facility and a 9,812 square-foot night club. The proposed redevelopment consists of a 66,100 square-foot retail facility and a self-park parking garage. The project is expected to be completed and opened by year 2018.

The 5th and Lenox redevelopment will be served by one (1) right-in/right-out driveway providing access to the parking garage located on the east side of Lenox Avenue between 5th Street and 6th Street. Two (2) Citibike stations with 16 bicycle docks each are located adjacent to the project site on the west side of Lenox Avenue between 6th Street and 7th Street and on the west side of Michigan Avenue between 5th Street and 6th Street. A project location map is provided as Figure 1. A site plan is provided in Appendix A.

Kimley-Horn and Associates, Inc. has completed this traffic impact analysis for submittal to the City of Miami Beach. The purpose of the study is to assess the project's impact on the surrounding roadway network and determine if adequate capacity is available to support future traffic volumes. The study's methodology is consistent with the requirements of the City of Miami Beach. Methodology correspondence detailing the traffic study requirements is included in Appendix B. This report summarizes the data collection, project trip generation and distribution, capacity analysis, queuing analysis, and entry gate analysis for the proposed redevelopment.

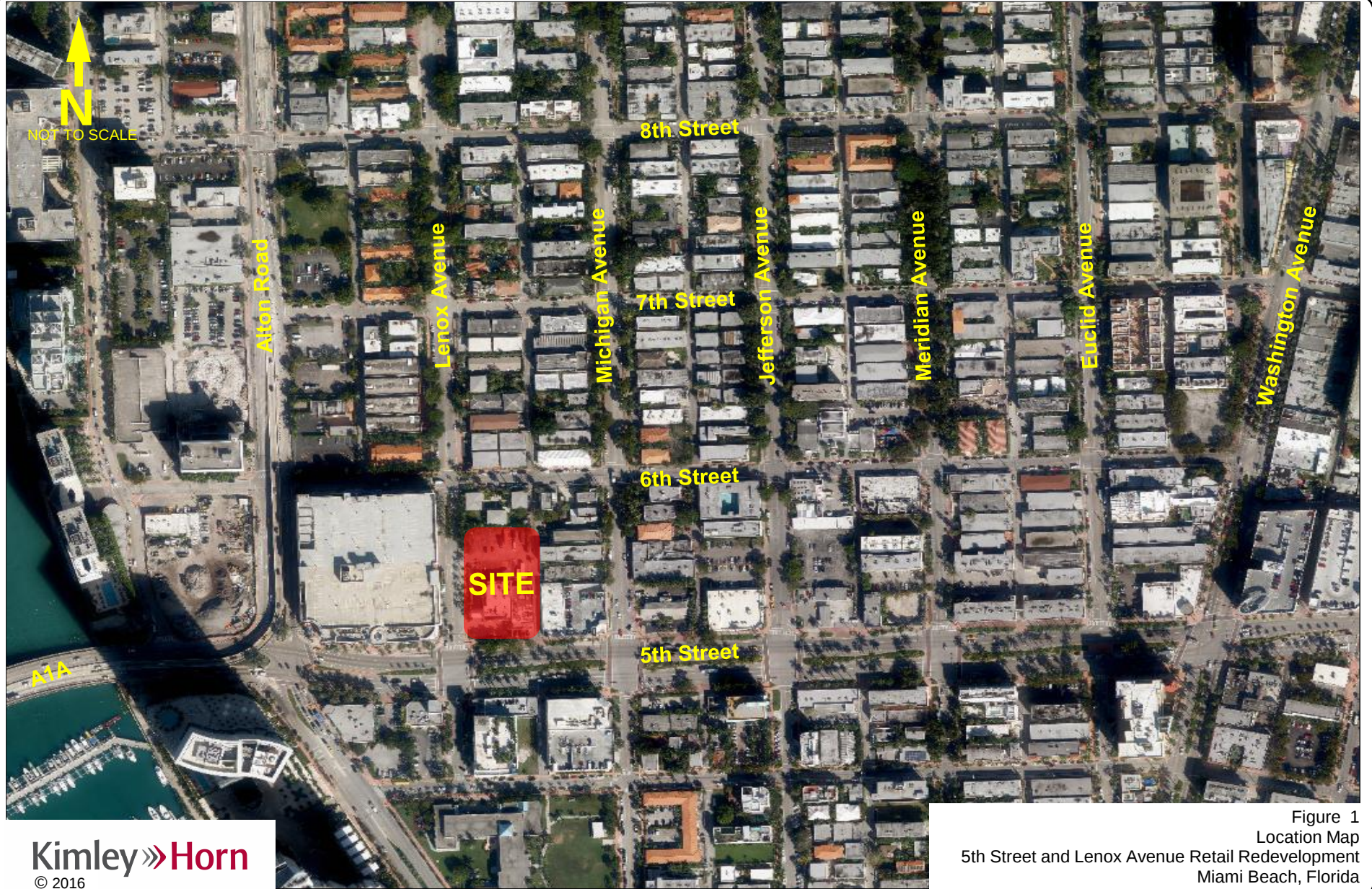


Figure 1
Location Map
5th Street and Lenox Avenue Retail Redevelopment
Miami Beach, Florida

ANALYSIS PERIOD

The two (2) hour analysis period selected for this study was based on two (2) 96-hour continuous traffic counts collected on 5th Street between Alton Road and Michigan Avenue and on Lenox Avenue between 5th Street and 6th Street. The 96-hour traffic counts were conducted from February 18, 2016 (Thursday) through February 21, 2016 (Sunday). The traffic data indicated that the peak period occurred on Thursday, February 18, 2016, from 2:00 P.M. to 4:00 P.M. Consistent with this peak period, all turning movement counts were collected on Thursday, February 18, 2016 from 2:00 P.M. to 4:00 P.M. Detailed 96-hour count data and peak period turning movement count data are provided in Appendix C.

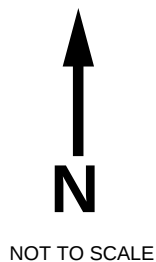
EXISTING TRAFFIC

P.M. peak period (2:00 P.M. to 4:00 P.M.) turning movement counts were collected on Thursday, February 18, 2016 at the following intersections:

- 5th Street and Alton Road
- 5th Street and Lenox Avenue
- 5th Street and Michigan Avenue
- 6th Street and Alton Road
- 6th Street and Lenox Avenue
- 6th Street and Michigan Avenue

The traffic volumes were collected in 15-minute intervals and the peak hour was determined for each intersection. City of Miami Beach peak season conversion factors were developed from Florida Department of Transportation (FDOT) data and were applied to the traffic counts to adjust the traffic to peak season volumes. The appropriate peak season conversion factor of 1.10 was applied to collected turning movement counts. Please note that the eastbound approach at the intersection of Alton Road and 6th Street was closed as a result of construction during the data collection period. Therefore, it is assumed to be closed under all analysis conditions.

Existing signal phasing and timing patterns were obtained from the Miami-Dade County Department of Transportation and Public Works – Signals and Signs Division for the signalized intersections required to be evaluated in this analysis. The turning movement counts, FDOT peak season factor category report, and signal timing data are included in Appendix C. Figure 2 presents the existing turning movement volumes at the study intersections during the peak hour.



Legend

- Study Roadway
- Study Intersection
- P.M. Peak Hour Traffic

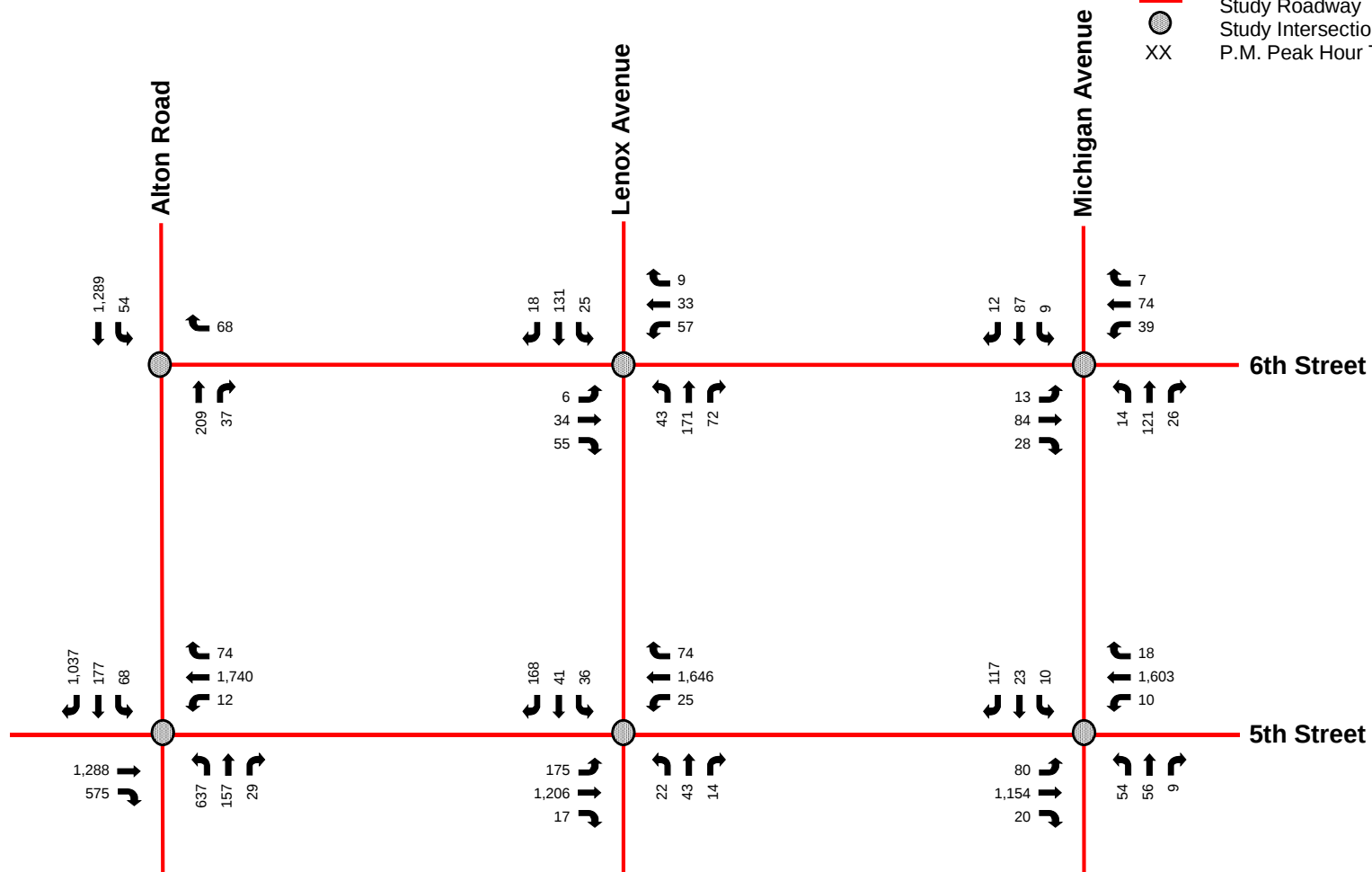


Figure 2
Existing Peak Hour Traffic Volumes
5th Street and Lenox Avenue Retail Redevelopment
Miami Beach, Florida

FUTURE BACKGROUND TRAFFIC

Future background traffic conditions are defined as expected traffic conditions on the roadway network in the year 2018 without the construction of the proposed redevelopment. Future background traffic volumes used in the analysis are the sum of the existing traffic and an additional amount of traffic generated by growth in the study area. Refer to Figure 3 for the 2018 P.M. peak hour background traffic volumes.

Background Area Growth

Future traffic growth on the transportation network was determined based upon (1) historic growth trends at nearby FDOT traffic count stations and (2) traffic volume comparisons from the year 2010 and 2040 Florida Standard Urban Transportation Model Structure (FSUTMS) - Southeast Florida Regional Planning Model (SERPM) model.

FDOT count stations referenced in this analysis include:

- Count Station #2527: SR A1A/McArthur Causeway – 200 feet west of SR 907/Alton Road
- Count Station #2528: SR A1A/McArthur Causeway – 150 feet east of Meridian Avenue

The historic growth rate analysis based on FDOT count stations determined a growth rate of negative 0.09 percent (-0.09%) annually over the most recent ten (10) year period.

Based on the forecasted volumes obtained from the 2010 and 2040 FSUTMS SERPM models, an annual growth rate of 0.55 percent (0.55%) in the vicinity of the redevelopment was calculated. In order to provide a conservative analysis, the highest growth rate of 0.55 percent (0.55%) was applied annually to the existing traffic volumes for future (2018) background conditions. The worksheets used to analyze the historic growth trends along with the FSUTMS transportation model outputs are included in Appendix D.

Committed Development

City of Miami Beach was contacted to determine if any projects that have been approved but not yet completed in the vicinity of the project site should be accounted for in this analysis. The following developments were identified as committed developments:

- 600 Alton Road
- Coco Bambu – 955 Alton Road
- Urban Box Self Storage – 633 Alton Road
- Baptist Health Urgent Care – 709 Alton Road

These developments were included as future background conditions. Trip assignments for these developments are included in Appendix E.

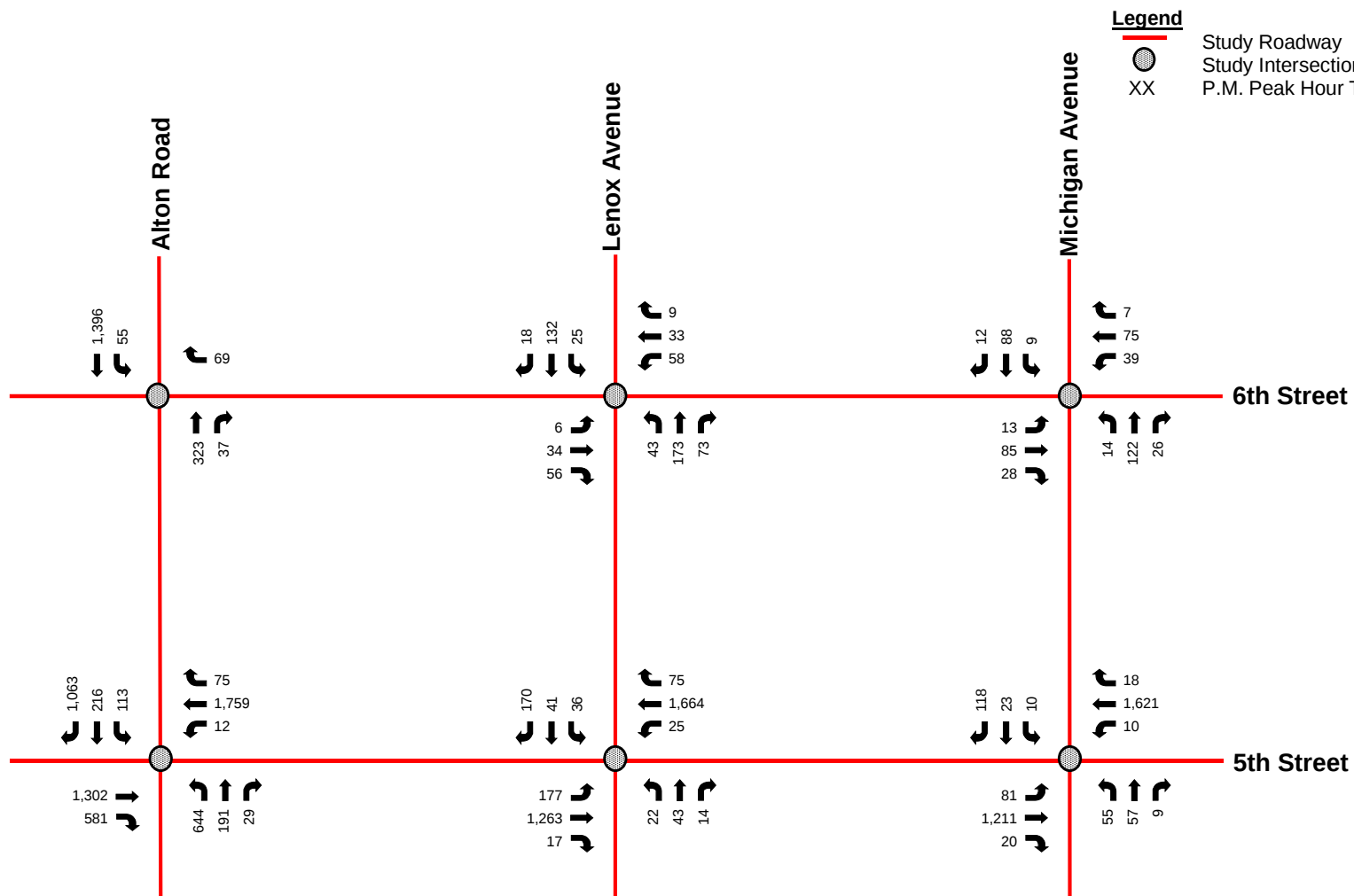
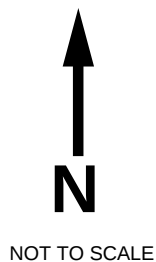


Figure 3
Future Background Peak Hour Traffic Volumes
5th Street and Lenox Avenue Retail Redevelopment
Miami Beach, Florida

PROJECT TRAFFIC

Project traffic used in this analysis is defined as the vehicle trips expected to be generated by the project and the distribution and assignment of that traffic over the study roadway network.

Existing and Proposed Land Uses

The parcel proposed for redevelopment is currently occupied by a 5,568 square-foot car rental facility and a 9,812 square-foot night club. The proposed redevelopment consists of a 66,100 square-foot retail facility. The redevelopment is expected to be completed and opened by 2018.

Project Access

The 5th and Lenox redevelopment will be served by one (1) right-in/right-out driveway providing access to the parking garage located on the east side of Lenox Avenue between 5th Street and 6th Street. Two (2) Citibike stations with 16 bicycle docks each are located adjacent to the project site on the west side of Lenox Avenue between 6th Street and 7th Street and on the west side of Michigan Avenue between 5th Street and 6th Street.

Trip Generation

Trip generation for the project was calculated using existing driveway turning movement counts and equations contained in the Institute of Transportation Engineers' (ITE's) *Trip Generation Manual*, 9th Edition. Existing driveway turning movement counts during the P.M. peak hour were used to calculate the trip generation for the existing car rental facility as a Land Use Code (LUC) for car rental facilities are not included in the ITE's *Trip Generation Manual*, 9th Edition. ITE LUC 925 (Drinking Place) was used for the existing night club and LUC 820 (Shopping Center) was used for the proposed retail facility.

Internal Capture

Internal capture is expected between the complementary land uses within a project and neighboring developments. Internal capture trips are trips made among the on-site uses, which in the case of this project are trips between the proposed redevelopment and the existing 5th &

Alton retail development located along the west side of Lenox Avenue. Internal capture trips will be made by walking and will not result in additional vehicle trips on the roadway network. Internal capture trips for the project were determined based upon methodology contained in the ITE's, *Trip Generation Handbook*, 3rd Edition. The internal capture for the proposed redevelopment is expected to be 20.0 percent (20.0%). Internal capture calculations are contained in Appendix F.

Pass-By Capture

Pass-by capture trips were determined based on average rates provided in the *Trip Generation Handbook*, August 2014. The pass-by capture rate for LUC 820 (Shopping Center) is 34.0 percent (34.0%) during the P.M. peak hour.

Multimodal Reduction

In order to account for the urban environment in which the project site is located, a multimodal (public transit, bicycle, and pedestrian) reduction of 10.0 percent (10.0%) was applied to project traffic. It is expected that some employees, nearby residents, and guests will choose to walk or bike to the proposed redevelopment. It is also anticipated that patrons will walk to the adjacent retail stores, other restaurants, and local places of interest. Furthermore, it is expected that a portion of the trips including employee trips will utilize public transit. Miami-Dade County Transit (MDT) provides bus service via five (5) routes and the City of Miami Beach's Alton West trolley operates in the vicinity of the site:

- Route 103/Route C operates on 5th Street/SR A1A within the vicinity of the project. This route serves the Downtown (Miami) Bus Terminal, Main Library, Historical Museum of South Florida, Miami Art Museum, Government Center Metrorail station, Omni Metromover Station/Bus Terminal, and the City of Miami Beach. This route operates with 20-minute headways throughout the day and provides connecting service to 23 additional Miami-Dade Transit bus routes, as well as the Metrorail via the Metromover.

- Route 113/Route M operates on 5th Street/SR A1A and Alton Road within the vicinity of the project. This route serves the Civic Center Metrorail station, University of Miami/Jackson Memorial hospitals and clinics, Cedars Medical Center, VA Hospital, Omni Metromover Station/Bus Terminal, MacArthur Causeway, City of Miami Beach, South Beach, Lincoln Road, and Mt. Sinai Hospital. This route operates with 60-minute headways and provides connecting service to 18 additional Miami-Dade Transit bus routes, as well as the Metrorail.
- Route 119/Route S operates on 5th Street/SR A1A and Alton Road within the vicinity of the project. This route serves the Downtown Miami Bus Terminal, Main Library, Historical Museum, Miami Art Museum, Government Center Metrorail station, Omni Bus Terminal, MacArthur Causeway, City of Miami Beach, South Beach, Lincoln Road, Collins Avenue, 192 Street Causeway, City of Aventura, and Aventura Mall. This route operates with 12-minute headways and provides connecting service to 25 additional Miami-Dade Transit bus routes, as well as the Metrorail.
- Route 120/Beach Max operates on 5th Street/SR A1A within the vicinity of the project. This route serves the Downtown (Miami) Bus Terminal, Main Library, Historical Museum, Miami Art Museum, Govt. Center Metrorail station, Miami Dade College Wolfson Campus, Omni Bus Terminal, MacArthur Causeway, City of Miami Beach, Collins Avenue, Town of Surfside, City of Bal Harbour, Haulover Park Marina, and Aventura Mall. This route operates with 15-minute headways throughout the day and provides connections to the Omni Metromover Station/Bus Terminal, Aventura Mall and Downtown Bus Terminal, as well as the Metrorail via the Metromover.
- Route 123/South Beach Local operates on Alton Road within the vicinity of the project. This route serves Belle Isle, Collins Park, South Miami Beach, Biscayne Street, Ziff Jewish Museum, Washington Avenue, the Fillmore Miami Beach at the Jackie Gleason Theatre, 17th Street, City Hall, Meridian Avenue, Holocaust Memorial, Dade Boulevard, Bay Road/20th Street, Lincoln Road, West Avenue, Alton Road, and the Miami Beach Marina.

This route operates with 13-minute headways throughout the day and provides connecting service to five (5) additional Miami-Dade Transit bus routes.

- Alton West Trolley operates on SR 907/Alton Road and West Avenue within the vicinity of the project. This route operates with 15-minute headways throughout the day.

Detailed route information and headway data is provided in Appendix E.

Net New Project Trips

Net new project trips are equal to the gross project trips minus internal capture, pass-by capture, and the multimodal reduction factor. The net new project trips represent additional vehicles on the roadway network. Table 1 summarizes the project's trip generation potential for the P.M. peak hour. As shown in Table 1, the redevelopment is expected to generate 111 net new trips during the P.M. peak hour. Detailed trip generation information is included in Appendix F.

Table 1: Proposed Net New Trip Generation						
P.M. Peak Hour						
			Entering		Exiting	
Future Land Use (ITE Code)	Scale	Net New External Trips	%	Trips	%	Trips
Existing Development						
Car Dealership ⁽¹⁾	5,568 square feet	5	50%	3	50%	2
Drinking Place (925)	9,812 square feet	100	66%	66	34%	34
Subtotal		105		69		36
Proposed Redevelopment						
Shopping Center (820)	66,100 square feet	216	48%	104	52%	112
Subtotal		216		104		112
Net New Redevelopment						
Net New Project Trips		111		35		76

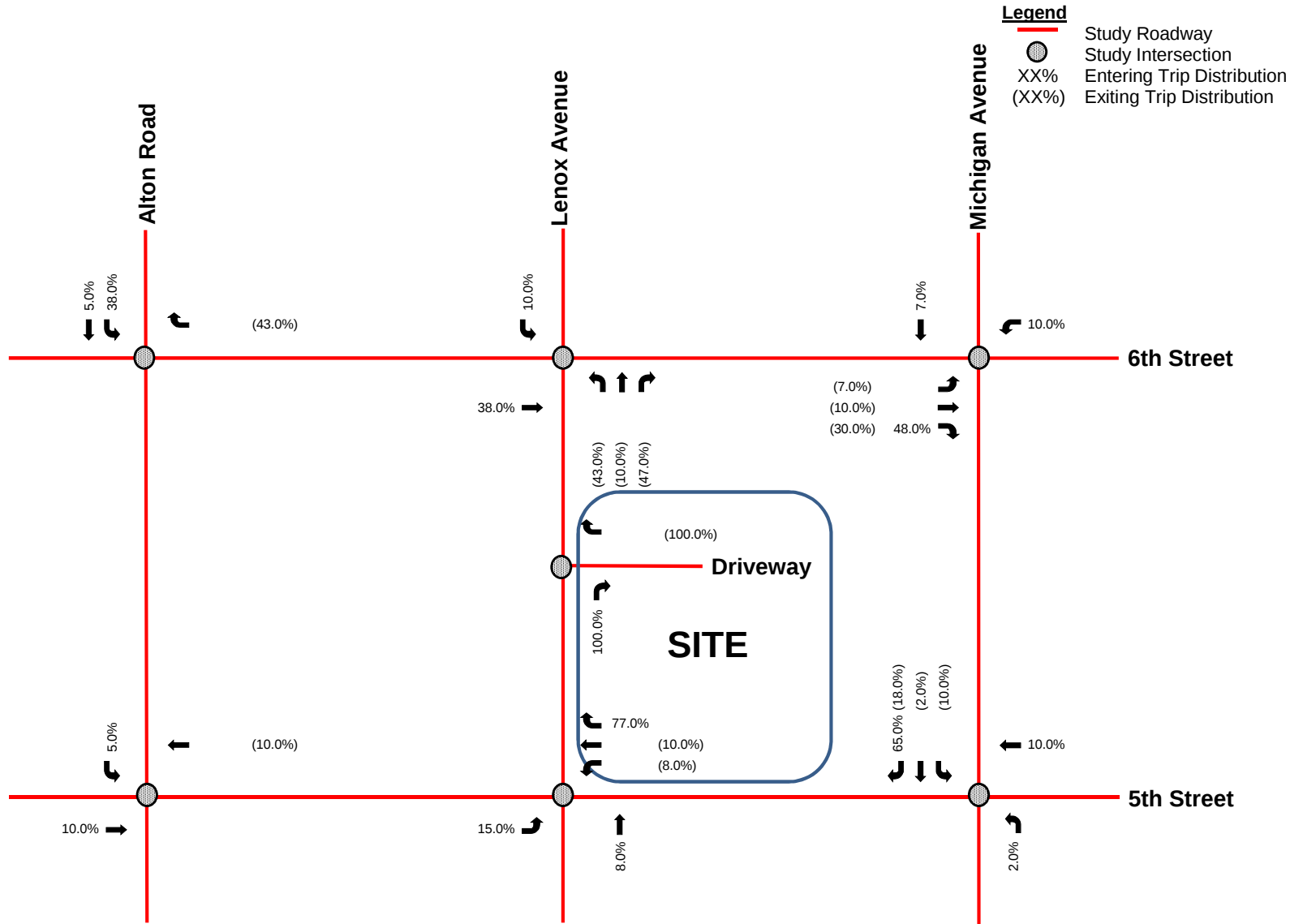
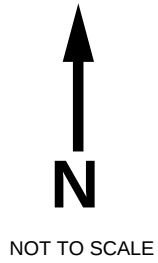
Note: (1) Trip generation based on driveway volumes as car rental facility land use is not included ITE's *Trip Generation Manual*, 9th Edition.

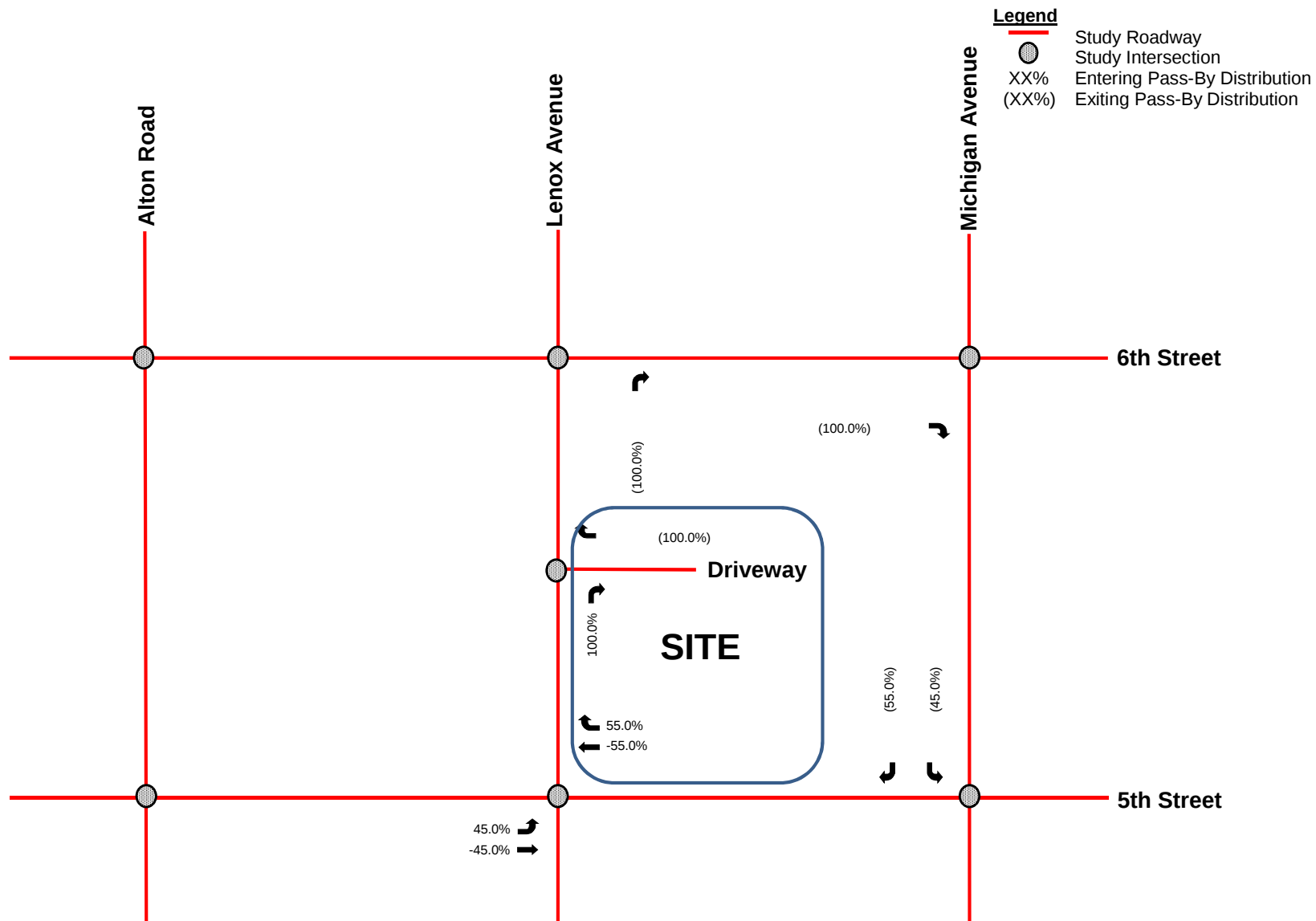
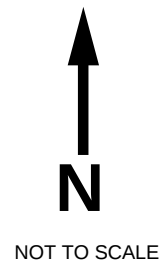
Trip Distribution and Assignment

The trip distribution was based on a cardinal trip distribution for the project site's traffic analysis zone (TAZ) obtained from the Miami-Dade Metropolitan Planning Organization's (MPO's) *Miami-Dade 2040 Long Range Transportation Plan Directional Trip Distribution Report*. The project is located within TAZ 652. The cardinal distribution is shown in Table 2. Figure 4 presents the project's net new traffic distribution for the P.M. peak hour. Detailed cardinal distribution calculations are contained in Appendix G.

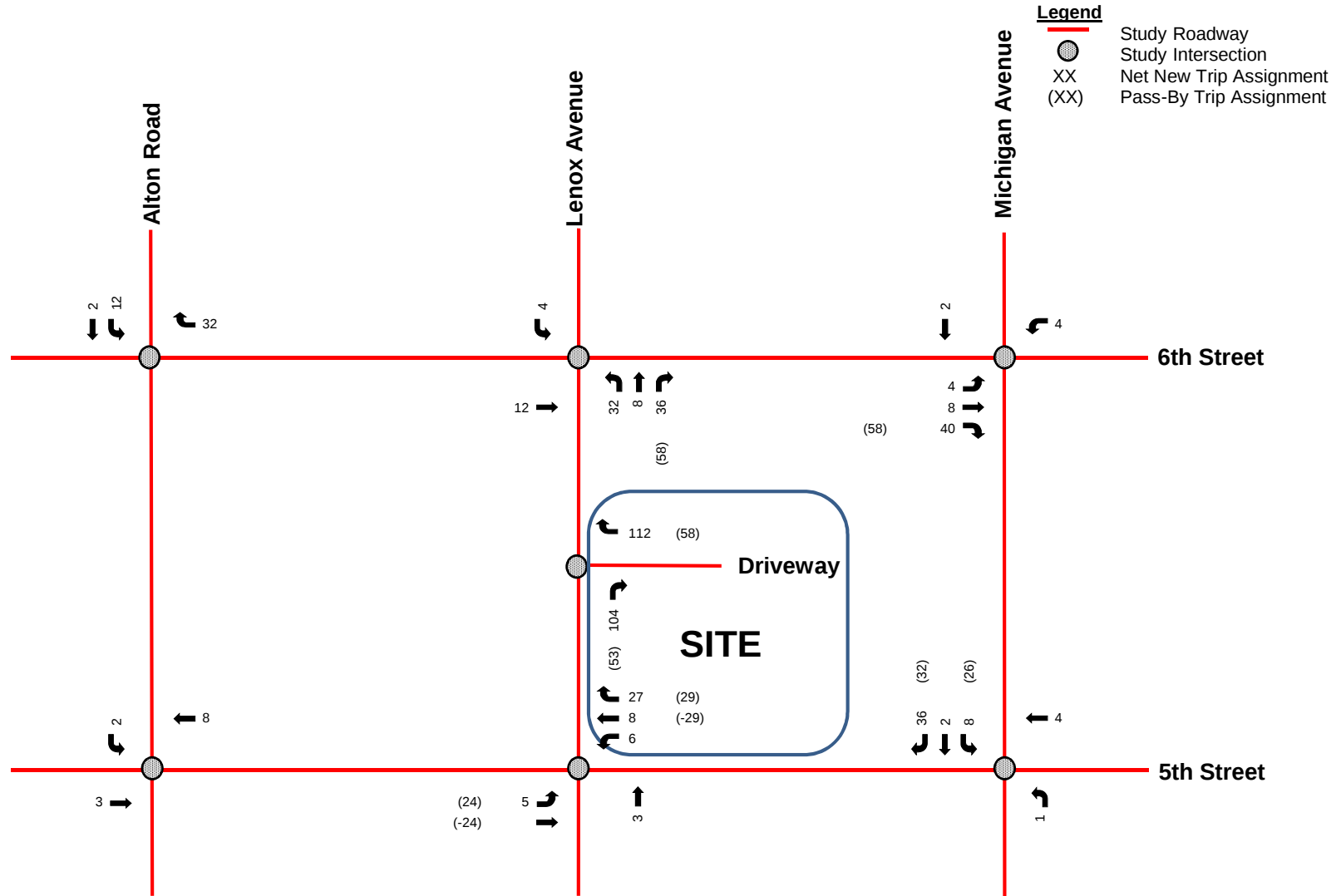
Table 2: Cardinal Trip Distribution	
Cardinal Direction	Percentage of Trips
North-Northeast	22.0%
East-Northeast	2.0%
East-Southeast	3.0%
South-Southeast	2.0%
South-Southwest	3.0%
West-Southwest	15.0%
West-Northwest	30.0%
North-Northwest	23.0%
Total	100.0 %

Figure 6 presents the project's net new traffic assignment for the P.M. peak hour.



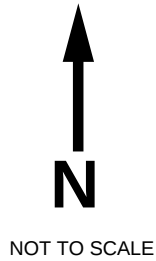



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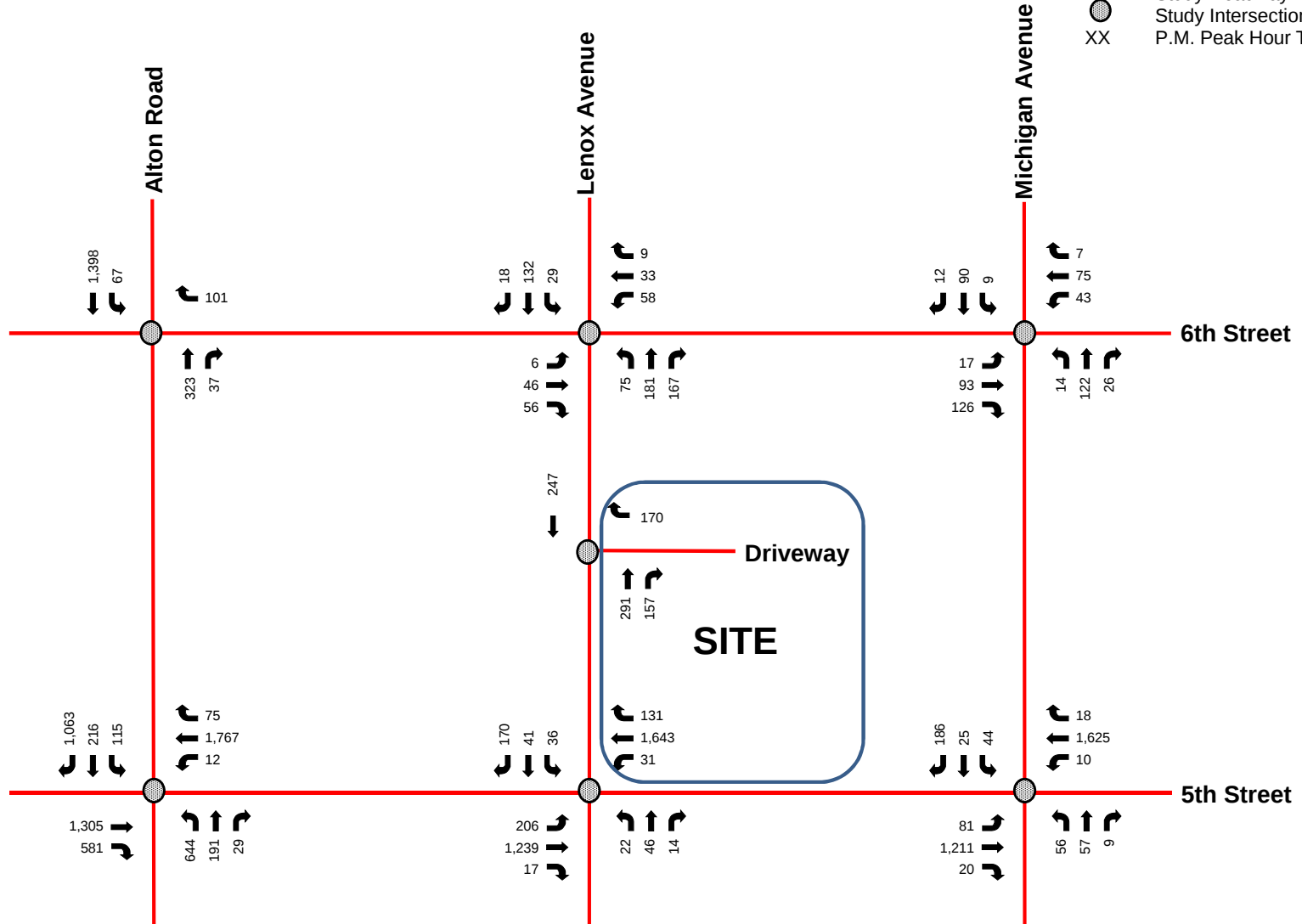


FUTURE TOTAL TRAFFIC

Future total traffic conditions are defined as the expected traffic conditions in the year 2018 after the opening of the project. Total traffic volumes considered in the analysis for this project are the sum of the background traffic volumes and expected project traffic volumes. The P.M. peak hour future traffic volumes are shown in Figure 7. Volume Development worksheets for the study intersections are included in Appendix H.



- Legend**
- Study Roadway
 - Study Intersection
 - XX P.M. Peak Hour Traffic



* The traffic volumes at the project driveway are total project volumes, while traffic volumes at external intersections are net new trips accounting for existing development.

Figure 7
Future Total Peak Hour Traffic Volumes
5th Street and Lenox Avenue Retail Redevelopment
Miami Beach, Florida

INTERSECTION CAPACITY ANALYSIS

The study area intersection operating conditions were analyzed for three (3) scenarios (existing conditions, future background conditions, and future total conditions) using Trafficware's *SYNCHRO 9.0* software, which applies methodologies outlined in the Transportation Research Board's (TRB's) *Highway Capacity Manual*, 2000 and 2010 Editions. Synchro worksheets for the study intersections are included in Appendix I.

A summary of the intersection analyses for the P.M. peak hour is presented in Table 3. Please note that as mass transit service with headways of 20 minutes or less operates within 0.25 miles of the study area, LOS D+20 was utilized as the adopted level of service standard consistent with the City of Miami Beach's *2025 Comprehensive Plan*. As Table 3 indicates, the study intersections are expected to operate at adopted levels of service (LOS D+20 or better) during the P.M. peak hour under all analysis conditions.

Table 3: Peak Hour Intersection Capacity Analysis						
Intersection	Traffic Control	Overall LOS/Delay	Approach LOS			
			EB	WB	NB	SB
Existing Conditions (Background Conditions) [Future Total Conditions]						
5th Street and Alton Road ⁽¹⁾	Signalized	D/45.7 (D/55.0) [D+20/57.2]	C (C) [C]	D (D) [D]	F (F) [F]	B (C) [C]
5th Street and Lenox Avenue	Signalized	A/9.3 (A/9.7) [A/9.7]	A (A) [A]	A (A) [A]	E (E) [E]	E (E) [E]
5th Street and Michigan Avenue	Signalized	B/12.0 (B/12.0) [B/14.2]	A (A) [A]	A (A) [A]	E (E) [E]	E (E) [E]
6th Street and Alton Road ⁽¹⁾	Signalized	B/11.1 (B/11.1) [B/12.9]	⁽²⁾ (⁽²⁾) [⁽²⁾]	E (E) [E]	A (A) [A]	A (A) [B]
6th Street and Lenox Avenue	All-Way Stop-Controlled	A/9.7 (A/9.7) [B/10.4]	A (A) [A]	A (A) [A]	B (B) [B]	A (A) [B]
6th Street and Michigan Avenue	All-Way Stop-Controlled	A/9.0 (A/9.0) [A/9.7]	A (A) [B]	A (A) [A]	A (A) [A]	A (A) [A]
Garage Access and Lenox Avenue	Two-Way Stop-Controlled	⁽³⁾ (⁽³⁾) [⁽⁴⁾]	⁽³⁾ (⁽³⁾) [⁽⁶⁾]	⁽³⁾ (⁽³⁾) [B]	⁽³⁾ (⁽³⁾) [⁽⁵⁾]	⁽³⁾ (⁽³⁾) [⁽⁵⁾]

Notes: ⁽¹⁾ Intersection cannot be analyzed in HCM 2010; therefore HCM 2000 was used.

⁽²⁾ Approach under construction. Intersection traffic counts and signal timings reflect operation under construction.

⁽³⁾ Project driveway only exists under future total conditions.

⁽⁴⁾ Overall intersection LOS is not defined, as intersection operates under stop-control conditions.

⁽⁵⁾ Approach operates under free-flow conditions. LOS is not defined.

⁽⁶⁾ Approach does not exist.

TURN LANE QUEUE LENGTH ANALYSIS

A 95th percentile queue analysis was performed to determine if the existing exclusive turn lanes at study intersections can sufficiently accommodate expected vehicle queue lengths under existing, future background, and future total traffic conditions. The 95th percentile queue lengths were calculated using Trafficware's *SYNCHRO 9.0* software. The results of the queue length analysis are summarized in Table 3. Synchro worksheets for the study intersections are included in Appendix I. The results of the analysis indicate that all queues are expected to be accommodated within the existing turn lanes at all study intersections with the exception of the following:

- 5th Street and Alton Road – Northbound left-turn lane under existing, future background, and future total conditions. Please note that the proposed redevelopment does not assign project traffic to this movement.
- 5th Street and Michigan Avenue – Eastbound left-turn lane and southbound right-turn lane under existing, future background, and future total conditions. Please note that the project does not assign project traffic to the eastbound left-turn movement. Please note that the southbound right-turn lane is constrained due to a Citibike station and on-street parking.

Table 4: Peak Hour Turn Lane Queuing Analysis				
<i>Existing (Future Background) [Future Total]</i>				
Intersection	Turn Lane	95 th Percentile Queue (ft) ⁽¹⁾	Existing Turn Lane Length (ft)	Turn Lane Sufficient?
5 th Street and Alton Road	Eastbound Right-Turn ⁽²⁾	<25 (<25) [<25]	260	Yes
	Westbound Left-Turn	m25 (m24) [m27]	140	Yes
	Westbound Right-Turn	<25 (<25) [<25]	285	Yes
	Northbound Left-Turn	#662 (#671) [#671]	245	No
	Southbound Right-Turn ⁽²⁾	<25 (<25) [<25]	380	Yes
5 th Street and Lenox Avenue	Eastbound Left-Turn	176 (m186) [m242]	255	Yes
	Westbound Left-Turn	<25 (<25) [m35]	125	Yes
	Southbound Right-Turn	79 (83) [83]	500	Yes
5 th Street and Michigan Avenue	Eastbound Left-Turn	170 (170) [170]	130	No
	Westbound Left-Turn	35 (35) [35]	150	Yes
	Southbound Right-Turn	149 (151) [238]	50	No
6 th Street and Alton Road	Southbound Left-Turn	106 (107) [125]	300	Yes
6 th Street and Lenox Avenue	Northbound Right-Turn	<25 (<25) [<25]	500	Yes

Notes:

⁽¹⁾ The 95th percentile queue length is based on Synchro 9 capacity analyses. Minimum queue of 25 feet assumed.

⁽²⁾ Movement operates under free-flow conditions.

95th percentile volume exceeds capacity, queue may be longer.

m 95th percentile queue is metered by upstream signal.

ENTRY GATE ANALYSIS

The parking garage entry gate along Lenox Avenue to access the redevelopment provides two (2) entry lanes. Appendix A includes the proposed site plan.

Each entry lane can accommodate two (2) vehicles including the service position without blocking operations on Lenox Avenue, assuming 22 feet per vehicle consistent with the passenger (P) vehicle classification as specified in the American Association of State Highway and Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets*, 2011.

Based on the trip generation prepared in Table 1, the proposed redevelopment is expected to generate a total of 157 P.M. peak hour inbound trips. Patrons entering the facility will gain access via a push-button ticket splitter machine. It was assumed that the average service rate for a guest would be approximately 400 vehicles per hour (9 seconds per vehicle).

In order to estimate the queue length, a traffic intensity ratio was calculated for patrons. Traffic intensity is defined as the hourly arrival rate divided by the hourly service rate. Table 5 summarizes the traffic intensities.

Table 5: Peak Hour Traffic Intensity			
Entry Gate Analysis P.M. Peak Hour			
Entering Volumes (vph)	Service Rates (vph)	Traffic Intensities	90 th Percentile Queue behind Service Position
157	800	0.20	Less than 25 feet

The traffic intensity for the guest entry lanes were plotted on the two-lane queue curve to determine the queue length behind the service position included in Appendix J. The 90th percentile queue length for the guest entry lanes is less than one (1) vehicle behind the service position during the P.M. peak hour. The site entrance is proposed to provide storage to accommodate one (1) vehicle behind the service position. Therefore, all anticipated queues are expected to be accommodated on-site without extending onto Lenox Avenue.

TRANSPORTATION DEMAND MANAGEMENT STRATEGIES

Transportation Demand Management (TDM) strategies are proposed to reduce the impacts of the project traffic on the surrounding roadway network. Typical measures promote bicycling and walking, encourage car/vanpooling and offer alternatives to the typical workday hours. The applicant will commit to implementing the following strategies:

- Bicycle racks (short-term parking) will be provided on-site.
- Transit information including route schedules and maps will be provided on-site.

Please note that two (2) Citibike stations with 16 bicycle docks each are located along Lenox Avenue just north of 6th Street and along Michigan Avenue just north of 5th Street.

CONCLUSION

MAC 1045 5th Street, LLC is proposing to redevelop the parcel located on the northeast quadrant of the intersection of 5th Street and Lenox Avenue in Miami Beach, Florida. The existing parcel consists of a 5,568 square-foot car rental facility and a 9,812 square-foot night club. The proposed redevelopment consists of a 66,100 square-foot retail facility and a self-park parking garage. The project is expected to be completed and opened by year 2018.

The 5th and Lenox redevelopment will be served by one (1) right-in/right-out driveway providing access to the parking garage located on the east side of Lenox Avenue between 5th Street and 6th Street. Two (2) Citibike stations with 16 bicycle docks each are located adjacent to the project site on the east side of Lenox Avenue between 6th Street and 7th Street and on the west side of Michigan Avenue between 5th Street and 6th Street.

An intersection capacity analysis was conducted at all study intersections. The results indicate that the study intersections are expected to operate at adopted levels of service (LOS D+20 or better) during the P.M. peak hour under all analysis conditions.

A turn lane queuing analysis was conducted for all exclusive turn lanes at study intersections. The results of the analysis indicate that all queues are expected to be accommodated within the existing turn lanes at all study intersections with the exception of the following:

- 5th Street and Alton Road – Northbound left-turn lane under existing, future background, and future total conditions. Please note that the proposed redevelopment does not assign project traffic to this movement.
- 5th Street and Michigan Avenue – Eastbound left-turn lane and southbound right-turn lane under existing, future background, and future total conditions. Please note that the project does not assign project traffic to the eastbound left-turn movement. Please note that the southbound right-turn lane is constrained due to a Citibike station and on-street parking.

An entry gate analysis was conducted for the project's proposed parking garage entrance along Lenox Avenue between 6th Street and 5th Street. The results indicate that the 90th percentile queue length for the guest entry lanes is less than one (1) vehicle behind the service position during the P.M. peak hour. The site entrance is proposed to provide storage to accommodate one (1) vehicle behind the service position. Therefore, all anticipated queues are expected to be accommodated on-site without extending onto Lenox Avenue.

APPENDIX A: Site Plan

5TH AND LENOX OPT 9

17-Mar-16

Lot Area	43,500 SF
	0.99 Acres

Building Gross Footage	
L1	FAR
Retail	26,284 SF
Lobby	1,194 SF
Mech & BOH	1,519 SF
Loading	2,792 SF
Circulation (Elev. Stairs)	3,466 SF
L2	
Lobby	1,921 SF
Retail	33,511 SF
Open Space	0 SF
Circulation (Stairs)	898 SF
L3	
Retail	5,795 SF
Lobby	1,366 SF
Ramp	0 SF
Circulation (Stairs)	300 SF
L4	
Lobby	1,366 SF
Retail	0 SF
Circulation (Stairs)	796 SF
L5	
Retail	0 SF
Lobby	0 SF
Open Space	0 SF
Stairs	300 SF
L6	
Retail	0 SF
Lobby	0 SF
Terrace	0 SF
Ramp	0 SF
Mech & BOH	0 SF
Circulation (Stairs)	300 SF
TOTAL SF	75,729 SF

ZYSCOVICH
ARCHITECTS

FAR		
Permitted	2.00	87,000 SF
Provided	1.74	75,704 SF

Leasable Area		65,590 SF
Retail	65,590 SF	

Common Area = Elevator Lobby + Elevator+ Shared Corridors

Parking			
Required			
Retail	1 SPACE /	300 SF	219
Total			219

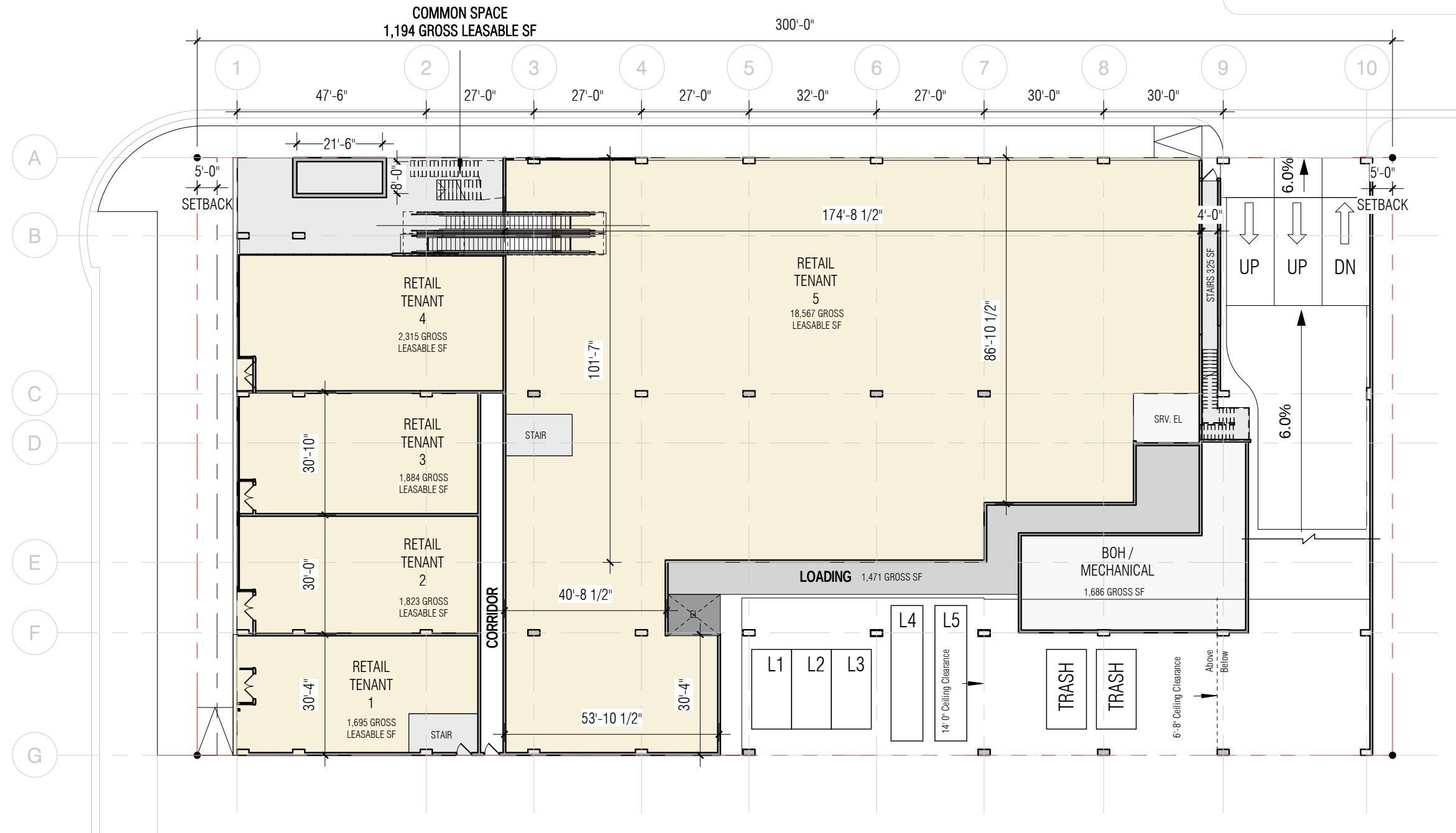
Provided	
LEVEL 1	0
LEVEL 2	0
LEVEL 3	62
LEVEL 4	62
LEVEL 5	105
LEVEL ROOF	
Total	229

Loading Requirements		
Tenant	Required	
1		5
Total	5	10'x20'

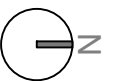
*Over 2,000 but not over 10,000: 1 space. Over 10,000 but not over 20,000: 2 spaces. Over 20,000 but not over 40,000: 3 spaces. Over 40,000 but not over 60,000: 4 spaces

5TH STREET

LENOX AVENUE



Notes: Add ramps into retail @ GL



5th at Lenox Option 8

Miami Beach, Florida

Ground

1" = 30'-0"

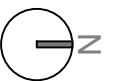
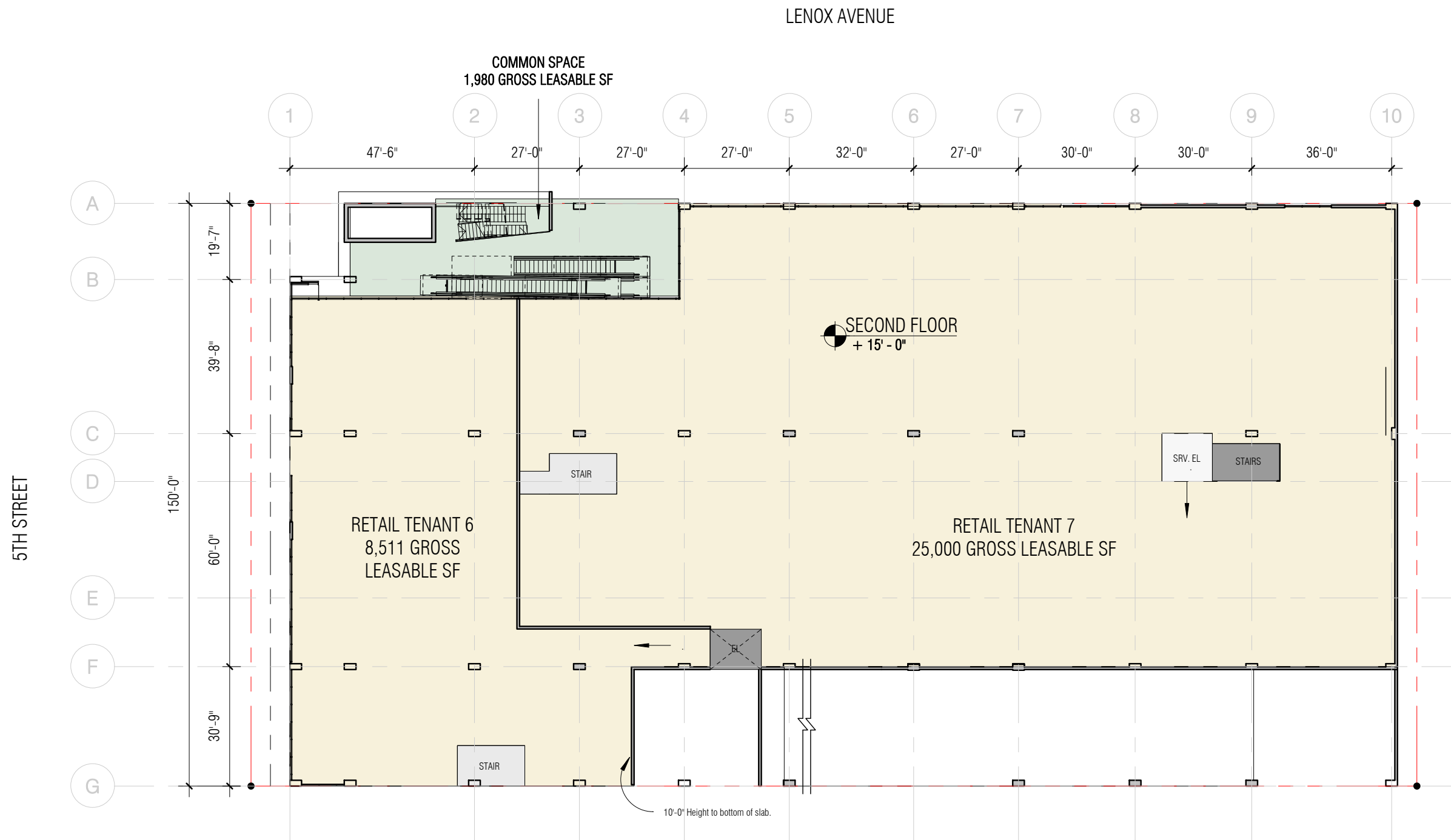
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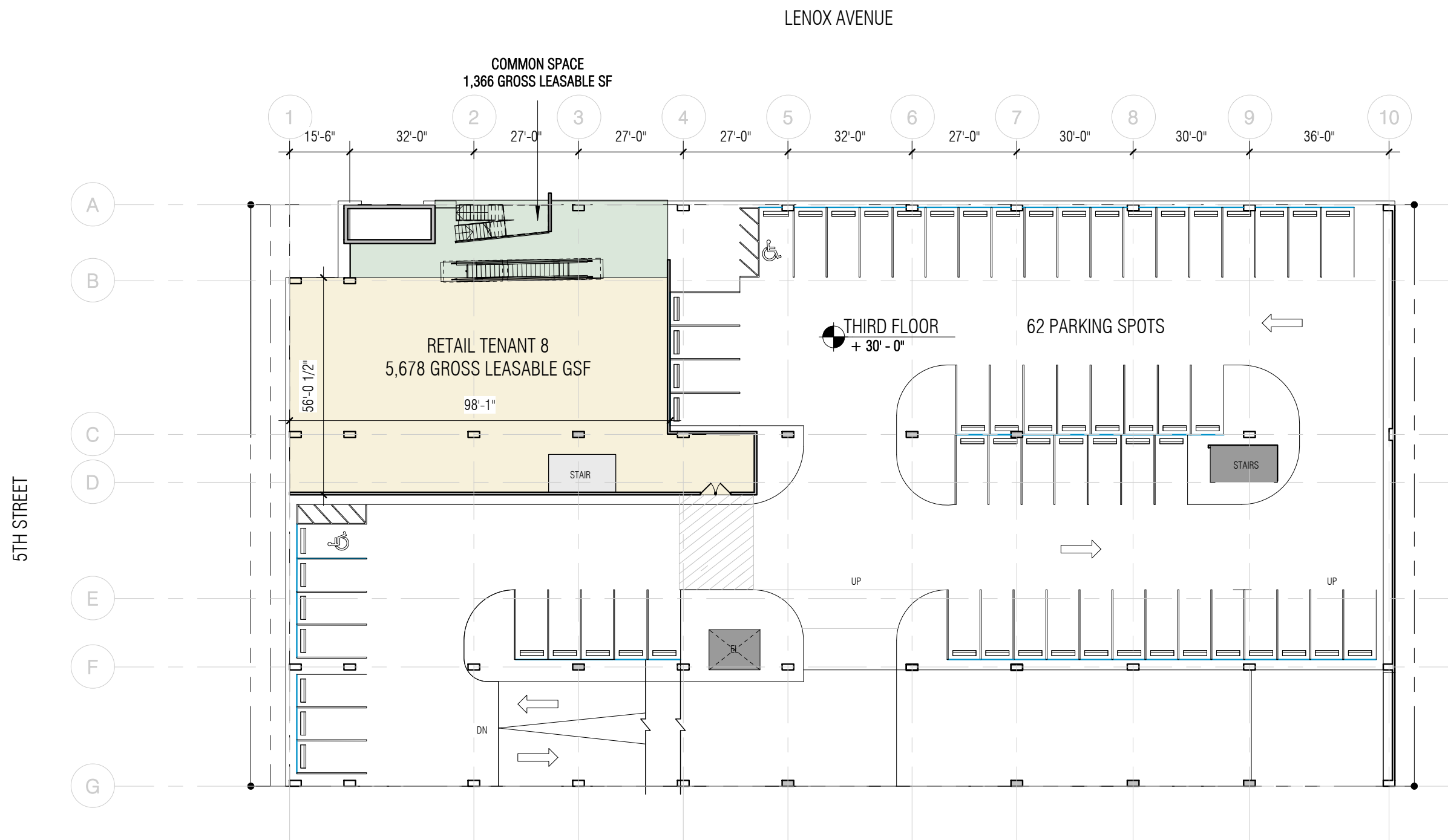
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APPENDIX B:

Methodology Correspondence



Memorandum

To: Xavier Falconi, P.E.
City of Miami Beach

From: Adrian K. Dabkowski, P.E., PTOE 

Cc: Steve Kalka, The Comras Group
Justin Karr, Esq., Bercow Radell & Fernandez
Rogelio Madan, AICP, City of Miami Beach
Claudia Lamus, P.E., FTE, Inc.

Date: February 10, 2016

***Subject: 5th Street and Lenox Avenue Retail Development
Traffic Study Methodology***

The purpose of this memorandum is to summarize the traffic study methodology discussed at our January 27, 2016 meeting. The proposed redevelopment is located on the northeast quadrant of the intersection of 5th Street/SR A1A and Lenox Avenue in Miami Beach, Florida.

The proposed redevelopment plan consists of 71,453 square feet of retail. Currently, the site is occupied by a 5,568 square-foot car rental facility and a 9,812 square-foot night club. Detailed development program information and a conceptual site plan are provided in Attachment A. The following sections summarize our proposed methodology.

TRIP GENERATION

Trip generation calculations for the proposed redevelopment were performed using the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 9th Edition. The trip generation for the proposed land use was determined using ITE Land Use Code (LUC) 820 (Shopping Center). For the existing car rental facility driveway turning movement counts will be collected during the analysis period. ITE LUC 925 (Drinking Place) will be used for the existing nightclub. Project trips will be estimated for the P.M. peak hour.

An internal capture rate of 20.1 percent (20.1%) was calculated based on the interaction between the proposed retail facility and the existing 5th & Alton retail center located on the west side of Lenox Avenue and will be used in the analysis.

Please note that the applicant is contemplating a grade-separated pedestrian walkway between the two (2) developments. The grade-separated pedestrian walkway is assumed to increase the internal capture rate as patrons can shop or park at either facility without having to walk outside and conflict with traffic on Lenox Avenue. If the grade-separated pedestrian walkway is constructed, it is assumed that internal capture will be increased by 25.0 percent (25.0%) resulting in an internal capture rate of 25.1 percent (25.1%) for the proposed 5th Street and Lenox Avenue retail development. Internal capture calculations are contained in Attachment B.

A multimodal (public transit, bicycle, and pedestrian) reduction of 10 percent (10%) will be applied to the trip generation calculations to account for the urban environment in which the project site is located. It is expected that employees, nearby residents, and visitors will choose to walk to the proposed development. It is expected that a portion of the trips including employee trips will utilize transit. Miami-Dade County Transit provides bus service via five (5) routes in the vicinity of the site. Transit route information will be documented in the report.

Trip generation calculations may be revised based on the results of the analysis period determination, any revisions to the development program or site plan modifications, and if the grade-separated pedestrian bridge is pursued will be documented in the traffic impact analysis.

ANALYSIS PERIOD DETERMINATION

The analysis period will be based on one (1) peak period determined from two (2) 96-hour continuous traffic counts located on 5th Street between Alton Road and Michigan Avenue and on Lenox Avenue between 5th Street and 6th Street. The 96-hour counts will be collected on Thursday, Friday, Saturday, and Sunday. All traffic counts will be adjusted to account for seasonality using the appropriate Florida Department of Transportation (FDOT) seasonal factors for Miami Beach. Signal timing information will be obtained from Miami-Dade County Public Works and Waste Management Department – Traffic Signals and Signs Division. All background documentation collected will be provided in the Appendix of the traffic impact study.

STUDY AREA

Based on the proposed development plan, the following four-legged intersections in addition to the project driveways, are proposed to be analyzed.

1. Alton Road and 6th Street
2. Alton Road and 5th Street
3. Lenox Avenue and 6th Street
4. Lenox Avenue and 5th Street
5. Michigan Avenue and 6th Street
6. Michigan Avenue and 5th Street

Turning movement counts will include pedestrians and bicyclists.

TRIP DISTRIBUTION

Trip distribution will be determined based on turning movements counts collected at the study area intersections as well as the location of parking facilities used by the proposed redevelopment. Additionally, the distribution will be based on the cardinal trip distribution for the project site's traffic analysis zones (TAZs) obtained from the Miami-Dade Metropolitan Planning Organization's 2040 Cost Feasible Plan travel demand model. The project is located within TAZ 652. Therefore, a cardinal distribution was developed based on this TAZ. The traffic impact study will include graphics of the project traffic assignment and off-site valet trips at the project's driveways and the study intersections. The detailed cardinal distribution is provided in Attachment C.

BACKGROUND GROWTH RATE/MAJOR COMMITTED DEVELOPMENT

A background growth rate will be calculated based on historic growth trends at nearby Florida Department of Transportation (FDOT) traffic count stations. Additionally, growth rates based on Miami-Dade Metropolitan Planning Organization's (MPO) projected 2010 and 2040 model network volumes will be examined. The higher of the two (2) growth rates will be used in the analysis. Documentation will be provided in the Appendix of the traffic impact study.

At this time the City has indicated that the following committed projects are to be included as part of background conditions:

1. 700 Alton Road
2. Coco Bambu - 955 Alton Road
3. Urban Box Self Storage – 633 Alton Road
4. Baptist Health Urgent Care - 709 Alton Road

CAPACITY ANALYSIS

Capacity analyses will be conducted for the analysis period for the study intersections. Intersection analyses will be performed using *Synchro 9.0* traffic engineering analysis software which applies the Transportation Research Board's (TRB's), *Highway Capacity Manual* (HCM), 2000 and 2010 methodologies. Capacity analyses will be conducted for three (3) scenarios: existing, build-out without project, and build-out with project. The build-out year will be specified in the analysis.

The following figures will be included for the study intersections:

- Existing conditions
- Trip distribution
- Trip assignment (will outline which driveways are used for the various land uses)
- Future background traffic conditions (with growth rate and committed development traffic)
- Future total traffic conditions (with project)

QUEUEING ANALYSIS

A queueing analysis will be conducted for exclusive turn-lanes at study area intersections. The queueing analysis will utilize the 95th percentile queues reported from Trafficware's *Synchro* software. Analyses will be conducted for three (3) scenarios: existing, future background (without the project), and future total (with the project).

ON-SITE BICYCLE PARKING

Providing on-site bicycle parking will be examined and documented in the report for both short-term and long-term bicycle parking. The City of Miami Beach's *Bicycle Parking Guidelines*, March 2011 will be used in determining on-site bicycle parking feasibility.

ON-STREET PARKING

Any on-street parking modifications will be documented in the report. Furthermore, any proposed on-street parking modifications will be coordinated with the City of Miami Beach Parking Department. Coordination with the Parking Department will be documented in the traffic impact study.

TRANSPORTATION DEMAND MANAGEMENT STRATEGIES

Transportation Demand Management (TDM) strategies will be developed to reduce the impact of project traffic on the surrounding roadway network and promote trip reduction. Typical measures promote bicycling and walking, encourage car/vanpooling and offer alternatives to the typical workday hours.

ENTRY GATE ANALYSIS

An entry gate analysis will be prepared for the parking garage entrance. The entry gate queuing analysis will be prepared for the analysis peak hour. Entry gate queuing analysis will be conducted consistent with the procedures outlined in *Parking Structures – Planning, Design, Construction, Maintenance, and Repair*, 2000 and 2011. The purpose of this analysis is to determine any future queue storage deficiencies at the entry gates and provide preliminary recommendations for mitigating these deficiencies.

DOCUMENTATION

The results of the traffic analysis will be summarized in a report. The report will include supporting documents including signal timings, lane geometry, and software output sheets. The report will also include text and graphics necessary to summarize the assumptions and analysis.

A CD and electronic copy of the reports will be provided as part of the submittal package. Additionally, the Synchro analysis files will be provided on the CD. The submittal package will also include the latest site plan to scale.

A separate document will be prepared for the valet/queuing and maneuverability analyses.

VALET ANALYSIS

A valet operations queuing analysis will be prepared for the vehicle drop-off/pick-up area to ensure that queues do not spill back into public right-of-way.

Trip generation estimates will be utilized to provide for two (2) scenarios including typical/average scenario and highest demand (peak hour of generator) scenario. The typical/average demand scenario will be based on half of the highest demand scenario. Taxi traffic will also be accounted for in the analysis. The valet operations queuing analysis will be conducted consistent with procedures described in ITE's *Transportation and Land Development*, 1988. A traffic circulation figure will be prepared to illustrate the valet routes to and from the vehicle drop-off/pick-up area. A technical memorandum documenting analysis assumptions and results, including the location of valet lots along with the number of parking spaces assigned for valet operations and the required number of valet attendants to service the facility under both typical and highest demand will be prepared.

MANEUVERABILITY ANALYSIS

A maneuverability analysis for the parking garage and loading areas will be performed utilizing *AutoTURN* software. The results of the maneuverability analysis will be documented in a technical memorandum.

SIGHT DISTANCE ANALYSIS

The sight distance requirements for the parking garage driveway will be reviewed and analyzed. A sight distance exhibit will be prepared. The exhibit will identify sight distance obstructions.

K:\FTL_TPTO\043770000-MAC 5th & Lenox\Correspondence\Memo\02 10 16 5th and Lenox traffic study meth.docx

Attachment A

5TH AND LENOX

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Lot Area	43,500 SF
	0.99 Acres

FAR		
Permitted	2.00	87,000 SF
Provided	1.87	81,155 SF

Building Gross Footage		
L1	FAR	non-FAR
Retail	25,365 SF	
Lobby	600 SF	
Mech & BOH	2,061 SF	
Loading		
Circulation (Elev. Stairs)	1,484 SF	
L2		
Lobby	0 SF	
Retail	28,412 SF	
Open Space		
Circulation (Stairs)	600 SF	
L3		
Retail	17,676 SF	
Lobby	1,413 SF	
Ramp		
Circulation (Stairs)	405 SF	
L3M		
Lobby	0 SF	
Ramp		
Circulation (Stairs)	0 SF	
L4		
Lobby		
Parking		
Open Space		
Circulation (Stairs)	1,249 SF	
L5		
Parking		
Lobby	1,290 SF	
Terrace		
Ramp		
Mech & BOH		
Circulation (Stairs)	600 SF	
TOTAL SF	81,155 SF	

Leasable Area		93,249 SF
Retail	71,453 SF	
Common Area	21,796 SF	

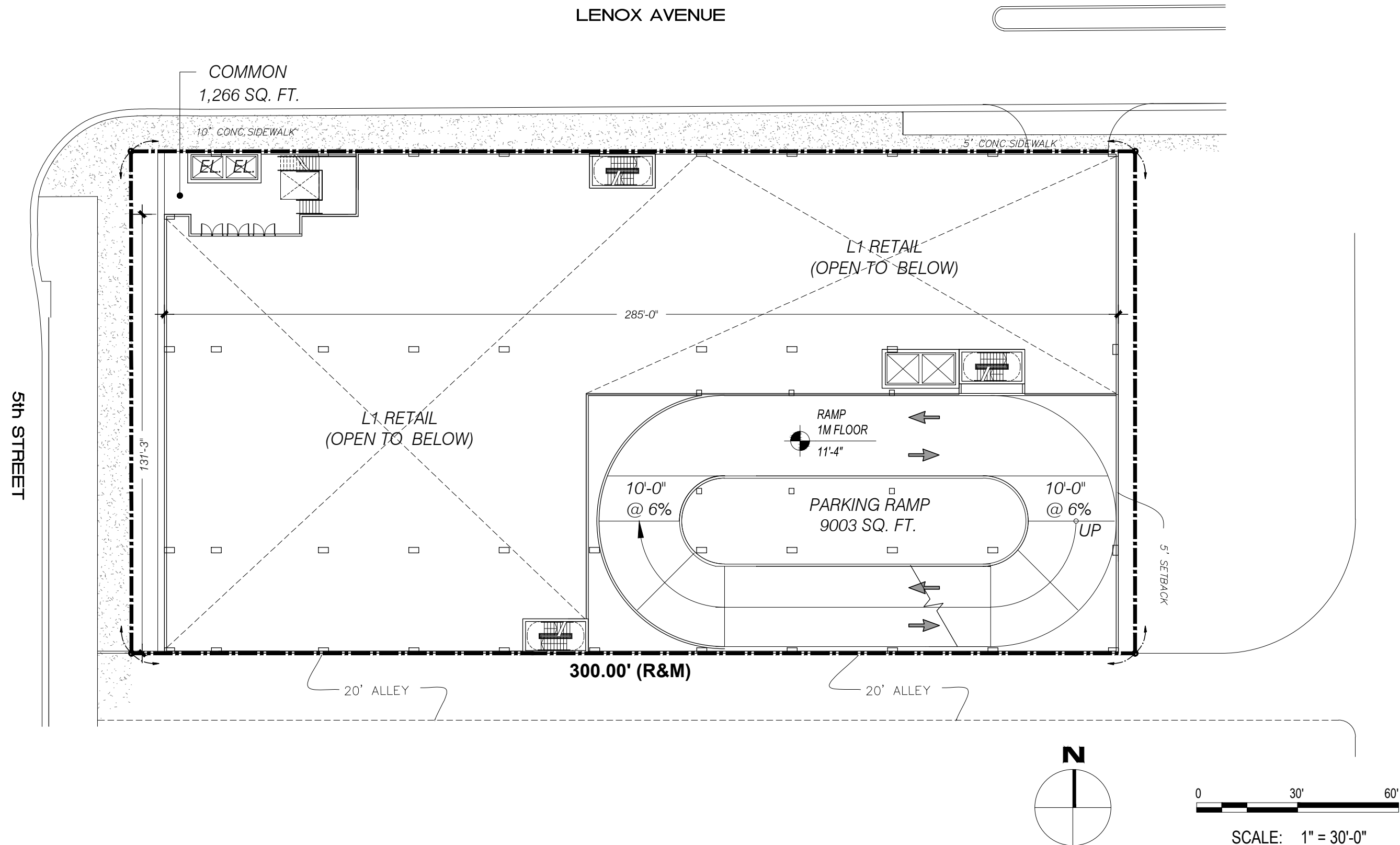
Common Area = Elevator Lobby + Elevator+ Shared Corridors

Parking			
Required			
Retail	1 SPACE /	300 SF	238
Total			238

Provided	
LEVEL 1	0
LEVEL 2	0
LEVEL 3M	36
LEVEL 4	36
LEVEL 5	91
LEVEL ROOF	80
Total	243

Loading Requirements			
Tenant		Required	
1	25,538 SF	3	
2	30,114 SF	3	
3	28,512 SF	3	
Total		9	10'x20'

*Over 2,000 but not over 10,000: 1 space. Over 10,000 but not over 20,000: 2 spaces. Over 20,000 but not over 40,000: 3 spaces. Over 40,000 but not over 60,000: 4 spaces



5th at Lenox Miami Beach, Florida

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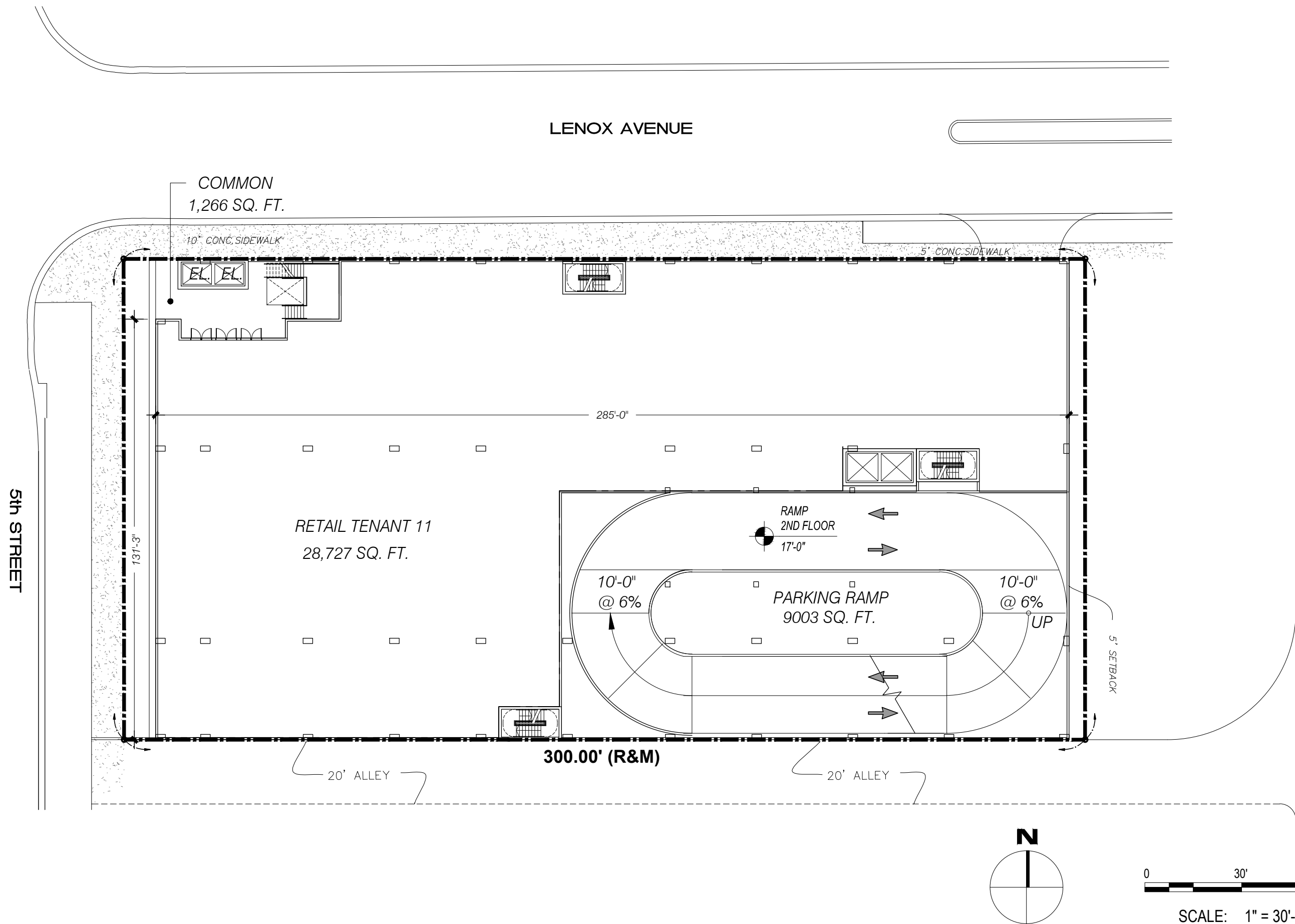
FIRST MEZ. FLOOR

SCALE: 1" = 30'-0"
NOVEMBER 3, 2015

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SECOND FLOOR

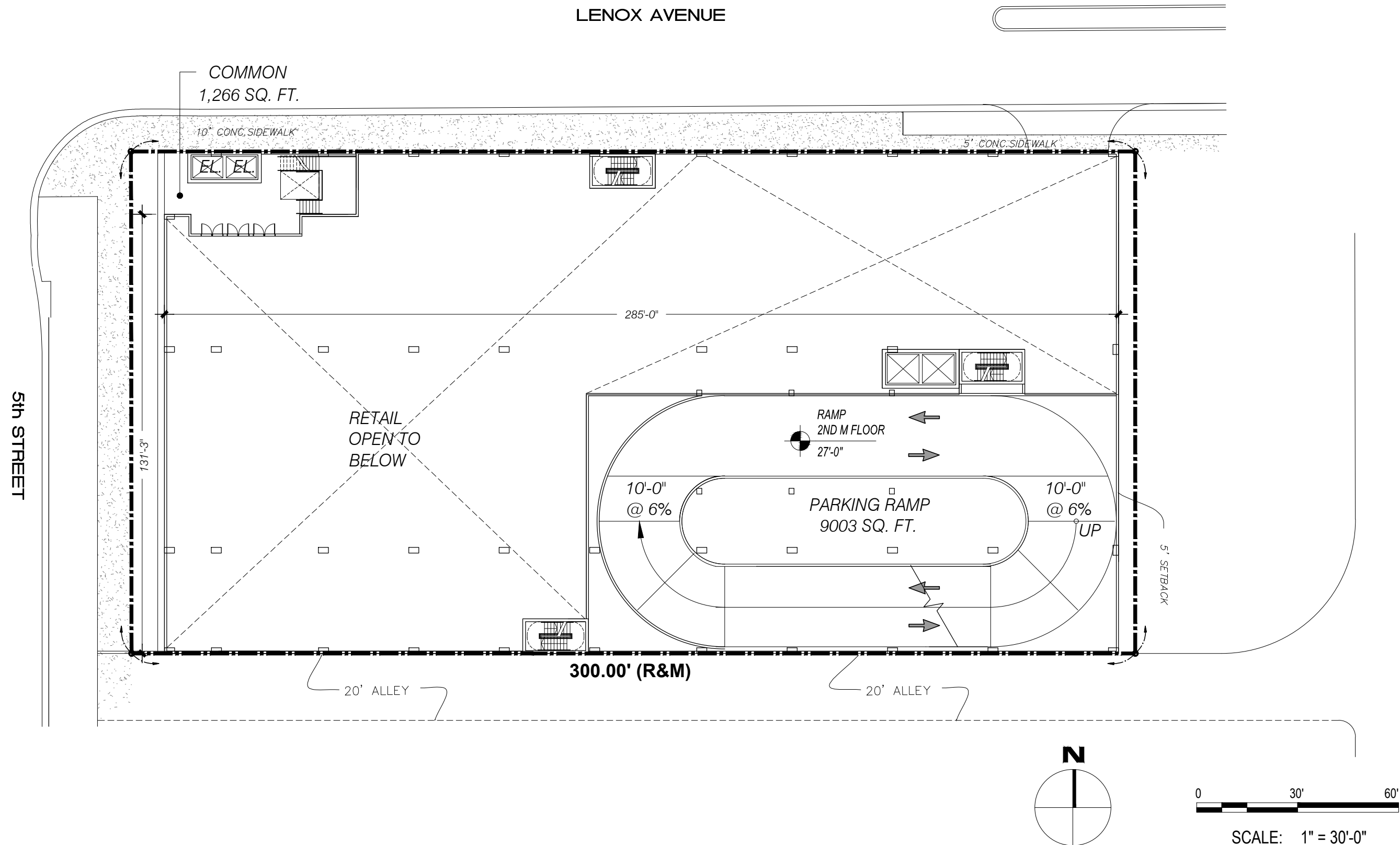
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2ND MEZZANINE FLOOR

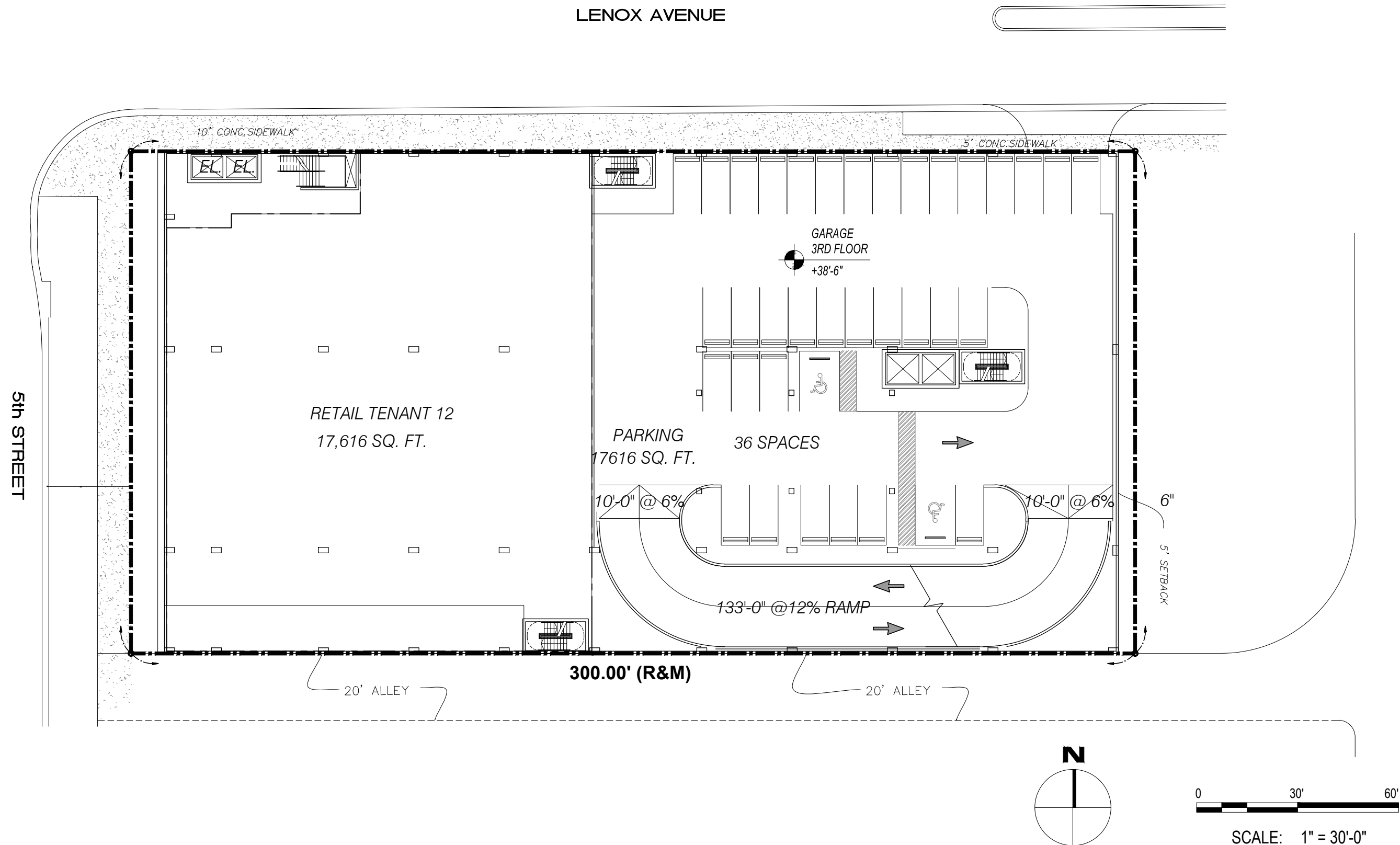
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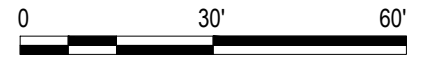
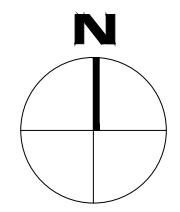
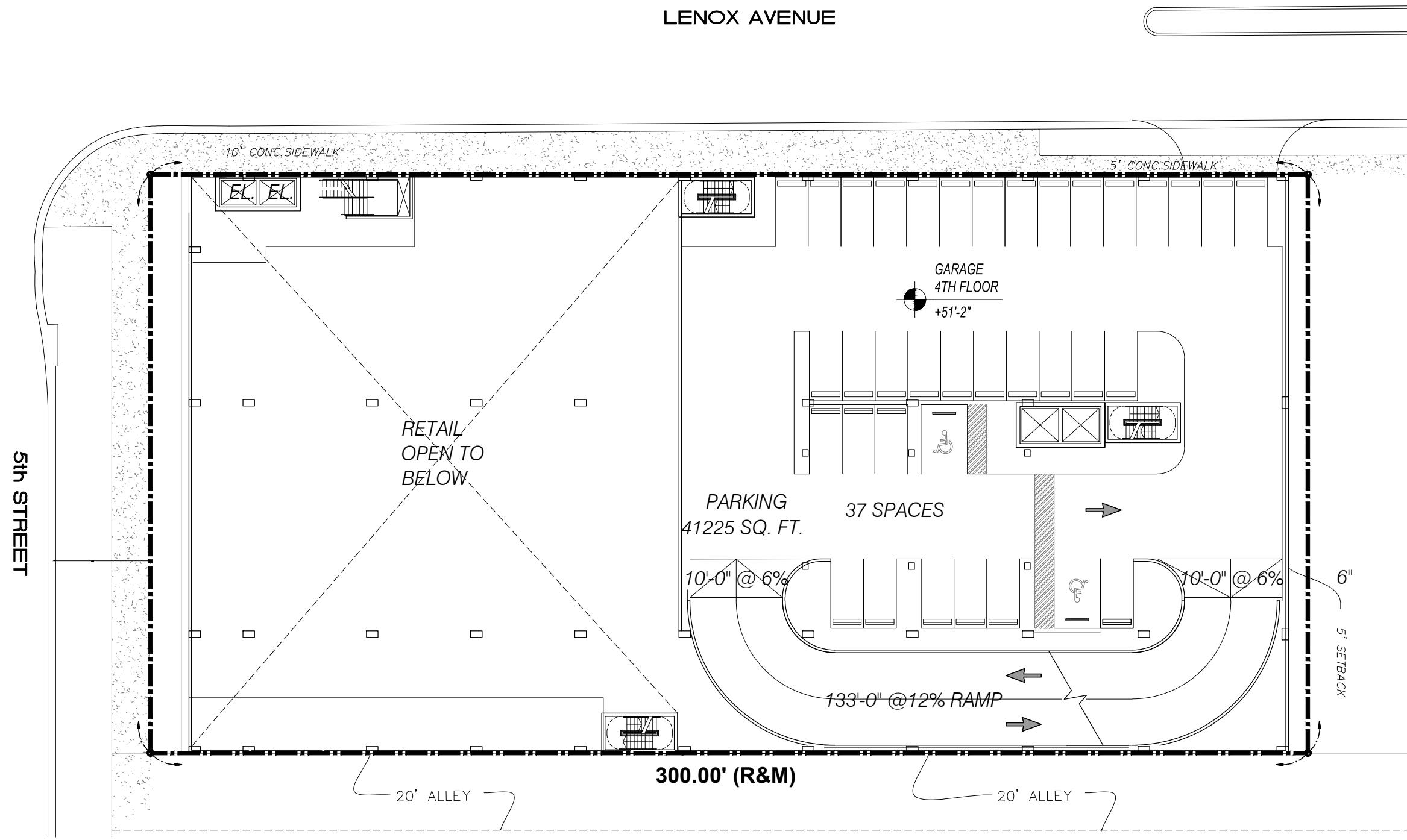
THIRD FLOOR

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SCALE: 1" = 30'-0"

NOVEMBER 3, 2015

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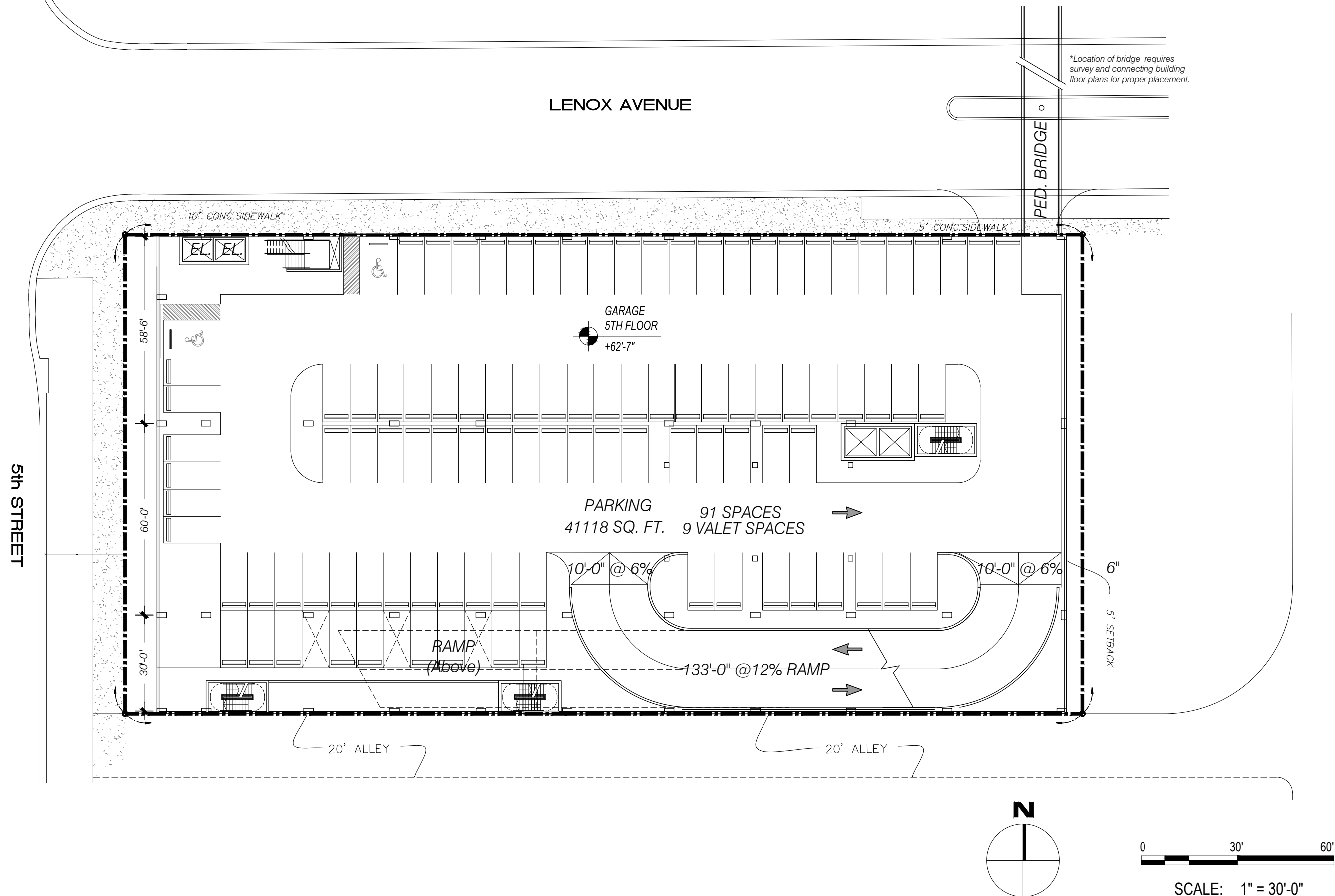
FOURTH FLOOR

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5th FLOOR

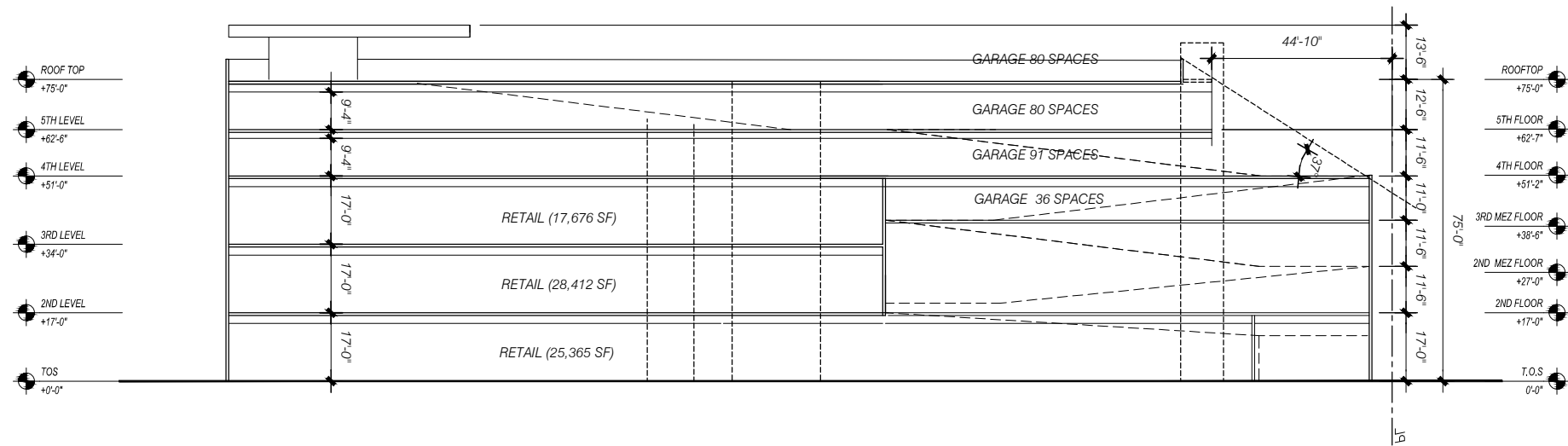
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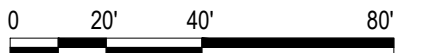
SCALE: 1" = 30'-0"

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SECTION



SCALE: 1" = 40'-0"

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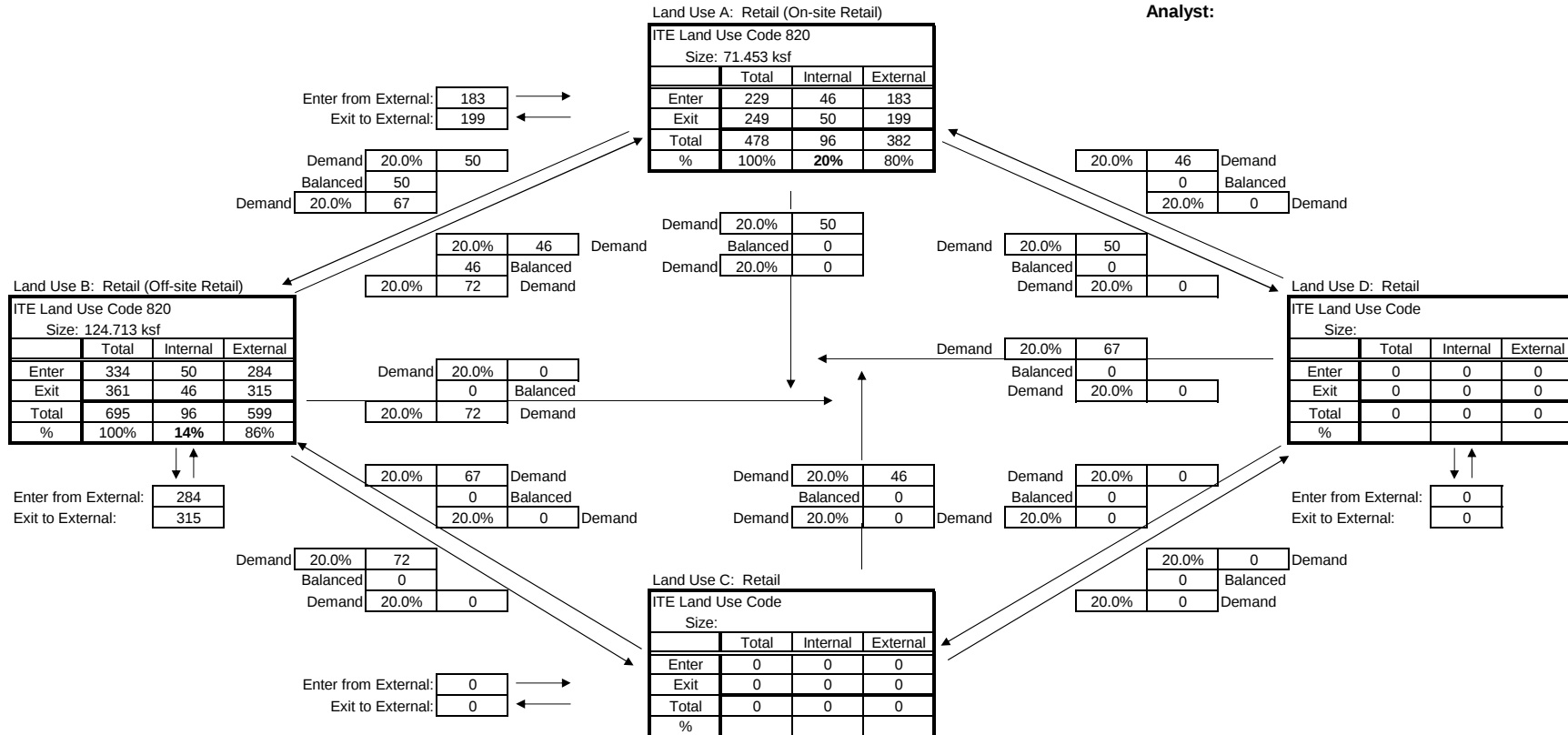
NOVEMBER 3, 2015

Attachment B

ITE MULTI-USE PROJECT INTERNAL CAPTURE WORKSHEET

(Source: Chapter 7, ITE Trip Generation Handbook, June 2004)

Project Number:
Project Name:
Scenario:
Analysis Period: PM Peak
Analyst:



NET EXTERNAL TRIPS FOR MULTI-USE DEVELOPMENT					
Category	Land Use				Total
	A	B	C	D	
Enter	183	284	0	0	467
Exit	199	315	0	0	514
Total	382	599	0	0	981
Single Use Trip Gen Estimate	478	695	0	0	1,173

20.1% 13.8% #DIV/0!

Overall Internal Capture = 16.37%

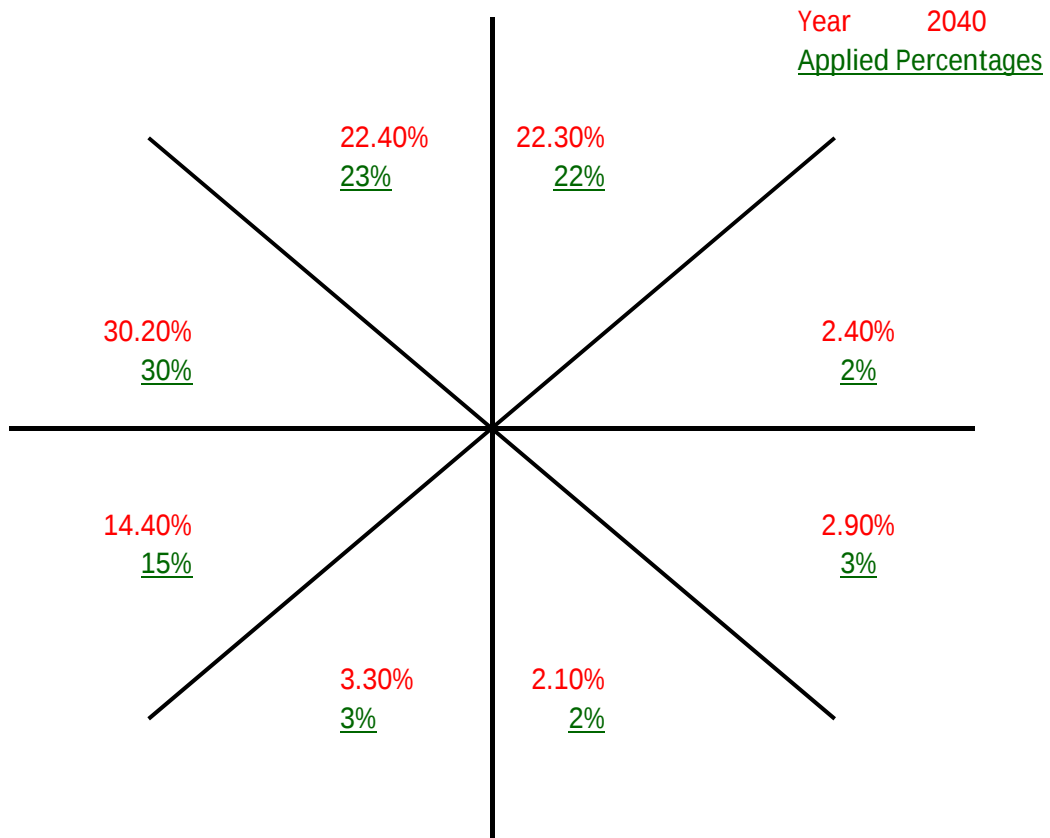
Attachment C



Miami-Dade 2040 Directional Distribution Summary

Origin TAZ			Cardinal Directions								Total
County TAZ	Regional TAZ		NNE	ENE	ESE	SSE	SSW	WSW	WNW	NNW	
636	3536	PERCENT	19.5	0.0	0.0	8.2	14.8	29.5	14.8	13.3	
637	3537	TRIPS	374	82	83	225	55	396	261	151	1,627
637	3537	PERCENT	23.0	5.0	5.1	13.8	3.4	24.3	16.0	9.3	
638	3538	TRIPS	232	28	34	125	70	269	193	126	1,077
638	3538	PERCENT	21.5	2.6	3.2	11.6	6.5	25.0	17.9	11.7	
639	3539	TRIPS	735	283	169	948	113	1,300	821	476	4,845
639	3539	PERCENT	15.2	5.8	3.5	19.6	2.3	26.8	17.0	9.8	
640	3540	TRIPS	430	255	683	151	73	932	515	373	3,412
640	3540	PERCENT	12.6	7.5	20.0	4.4	2.1	27.3	15.1	10.9	
641	3541	TRIPS	1,419	1,154	177	632	303	1,982	1,752	1,049	8,468
641	3541	PERCENT	16.8	13.6	2.1	7.5	3.6	23.4	20.7	12.4	
642	3542	TRIPS	2,179	1,098	137	956	454	3,066	2,615	1,535	12,040
642	3542	PERCENT	18.1	9.1	1.1	7.9	3.8	25.5	21.7	12.8	
643	3543	TRIPS	2,025	464	0	785	437	2,968	1,920	1,574	10,173
643	3543	PERCENT	19.9	4.6	0.0	7.7	4.3	29.2	18.9	15.5	
644	3544	TRIPS	2,373	0	0	0	1,831	4,426	3,267	2,854	14,751
644	3544	PERCENT	16.1	0.0	0.0	0.0	12.4	30.0	22.2	19.4	
645	3545	TRIPS	1,336	0	0	0	789	1,367	1,649	1,160	6,301
645	3545	PERCENT	21.2	0.0	0.0	0.0	12.5	21.7	26.2	18.4	
646	3546	TRIPS	950	0	142	324	255	1,435	1,393	1,140	5,639
646	3546	PERCENT	16.9	0.0	2.5	5.8	4.5	25.5	24.7	20.2	
647	3547	TRIPS	400	97	99	84	58	528	545	323	2,134
647	3547	PERCENT	18.7	4.6	4.6	3.9	2.7	24.7	25.5	15.1	
648	3548	TRIPS	1,129	496	172	440	46	1,080	1,249	650	5,262
648	3548	PERCENT	21.5	9.4	3.3	8.4	0.9	20.5	23.7	12.4	
649	3549	TRIPS	917	197	118	194	38	829	1,043	478	3,814
649	3549	PERCENT	24.0	5.2	3.1	5.1	1.0	21.7	27.4	12.5	
650	3550	TRIPS	88	112	79	9	31	340	412	150	1,221
650	3550	PERCENT	7.2	9.2	6.5	0.7	2.5	27.9	33.7	12.3	
651	3551	TRIPS	833	9	103	0	52	472	1,049	629	3,147
651	3551	PERCENT	26.5	0.3	3.3	0.0	1.7	15.0	33.3	20.0	
652	3552	TRIPS	856	91	112	82	128	551	1,157	859	3,836
652	3552	PERCENT	22.3	2.4	2.9	2.1	3.3	14.4	30.2	22.4	
653	3553	TRIPS	659	74	119	117	68	718	812	627	3,194
653	3553	PERCENT	20.6	2.3	3.7	3.7	2.1	22.5	25.4	19.6	
654	3554	TRIPS	814	0	220	127	186	1,003	1,184	881	4,415
654	3554	PERCENT	18.4	0.0	5.0	2.9	4.2	22.7	26.8	20.0	
655	3555	TRIPS	2,196	0	0	0	807	1,970	3,347	2,212	10,532
655	3555	PERCENT	20.9	0.0	0.0	0.0	7.7	18.7	31.8	21.0	
656	3556	TRIPS	565	0	0	0	108	489	1,022	769	2,953
656	3556	PERCENT	19.1	0.0	0.0	0.0	3.7	16.6	34.6	26.0	

Cardinal Distribution for TAZ 652



Cardinal Trip Distribution

Cardinal Direction	Percentage of Trips 2040	2040 Rounded
North-Northeast	22.30%	22.00%
East-Northeast	2.40%	2.00%
East-Southeast	2.90%	3.00%
South-Southeast	2.10%	2.00%
South-Southwest	3.30%	3.00%
West-Southwest	14.40%	15.00%
West-Northwest	30.20%	30.00%
North-Northwest	22.40%	23.00%
Total	100.0%	100.00%

APPENDIX C: Traffic Data

Signal Timing Data

TOD Schedule Report
for 2640: Alton Rd&5 St

Print Date:
1/25/2016

Print Time:
10:21 AM

<u>Asset</u>	<u>Intersection</u>	<u>TOD Schedule</u>	<u>Op Mode</u>	<u>Plan #</u>	<u>Cycle</u>	<u>Offset</u>	<u>TOD Setting</u>	<u>Active PhaseBank</u>	<u>Active Maximum</u>
2640	Alton Rd&5 St	DOW-2		N/A	0	0	N/A	0	Max 0

Splits

<u>PH 1</u>	<u>PH 2</u>	<u>PH 3</u>	<u>PH 4</u>	<u>PH 5</u>	<u>PH 6</u>	<u>PH 7</u>	<u>PH 8</u>
WBL	EBT	NBT	SBT	-	WBT	-	-
0	0	0	0	0	0	0	0
							

Active Phase Bank: Phase Bank 1

<u>Phase</u>	<u>Walk</u>	<u>Don't Walk</u>	<u>Min Initial</u>	<u>Veh Ext</u>	<u>Max Limit</u>	<u>Max 2</u>	<u>Yellow</u>	<u>Red</u>
<u>Phase Bank</u>								
	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3		
1 WBL	0 - 0 - 0	0 - 0 - 0	5 - 5 - 5	2 - 2 - 2	5 - 5 - 5	7 - 7 - 7	3.4	2.3
2 EBT	5 - 5 - 5	22 - 22 - 22	5 - 5 - 5	1 - 1 - 1	30 - 30 - 30	0 - 30 - 30	4	2
3 NBT	5 - 5 - 5	10 - 10 - 10	7 - 7 - 7	3 - 3 - 3	18 - 18 - 16	33 - 30 - 30	4	2
4 SBT	5 - 5 - 5	18 - 18 - 18	7 - 7 - 7	3.5 - 3.5 - 3.5	15 - 17 - 8	38 - 38 - 28	4	2
5 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
6 WBT	5 - 5 - 5	22 - 22 - 22	5 - 5 - 5	1 - 1 - 1	30 - 30 - 30	0 - 30 - 30	4	2
7 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
8 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0

Last In Service Date: unknown

Permitted Phases

12345678

Default 1234-6--
External Permit 0 -----
External Permit 1 -----
External Permit 2 -----

TOD Schedule Report

for 2640: Alton Rd&5 St

Print Date:

1/25/2016

Print Time:

10:21 AM

Current TOD Schedule	Plan	Cycle	Green Time								Ring Offset	Offset
			1 WB	2 EBT	3 NBT	4 SBT	5 -	6 WBT	7 -	8 -		
1		120	5	45	19	27	0	56	0	0	0	11
2		150	5	68	30	23	0	79	0	0	0	27
3		120	5	45	18	28	0	56	0	0	0	96
4		150	5	80	16	25	0	91	0	0	0	109
5		150	5	74	16	31	0	85	0	0	0	29
6		180	5	86	27	38	0	97	0	0	0	114
7		170	5	78	30	33	0	89	0	0	0	99
8		160	5	68	30	33	0	79	0	0	0	57
14		120	5	45	20	26	0	56	0	0	0	118
15		130	5	51	27	23	0	62	0	0	0	127
16		120	5	45	20	26	0	56	0	0	0	23
22		110	5	35	18	28	0	46	0	0	0	42
23		110	5	35	18	28	0	46	0	0	0	20
24		160	5	73	30	28	0	84	0	0	0	44
25		140	5	65	18	28	0	76	0	0	0	60
26		180	5	93	30	28	0	104	0	0	0	44
27		140	5	65	18	28	0	76	0	0	0	0

Local TOD Schedule

Time	Plan	DOW
0000	3	Su M T W Th F S
0500	2	M T W Th F
0500	3	Su
0800	6	M T W Th F
1000	7	Su
1130	5	M T W Th F
1300	6	M T W Th F
1615	7	M T W Th F
1845	8	M T W Th F
2000	4	Su

Current Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	8----3--	SuM T W ThF S
0700	TOD OUTPUTS	-----	M T W ThF
1000	TOD OUTPUTS	-----2-	SuM T W ThF
1500	TOD OUTPUTS	-----	SuM T W ThF S
1800	TOD OUTPUTS	8-----2-	M T W ThF

Local Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	8----3--	SuM T W ThF S
0700	TOD OUTPUTS	-----	M T W ThF
0800	TOD OUTPUTS	-----	Su
1000	TOD OUTPUTS	-----2-	SuM T W ThF
1500	TOD OUTPUTS	-----	SuM T W ThF S
1800	TOD OUTPUTS	8-----2-	M T W ThF
2000	TOD OUTPUTS	8-----2-	Su

* Settings

Blank - FREE - Phase Bank 1, Max 1
Blank - Plan - Phase Bank 1, Max 2
1 - Phase Bank 2, Max 1
2 - Phase Bank 2, Max 2
3 - Phase Bank 3, Max 1
4 - Phase Bank 3, Max 2
5 - EXTERNAL PERMIT 1
6 - EXTERNAL PERMIT 2
7 - X-PED OMIT
8 - TBA

No Calendar Defined/Enabled

SIGNAL OPERATING PLAN



	Direction	WB		EB	NB			SB		Ped Heads			N	
Timing Phases	Head No.	1 LV	6	2	3	3/8	8	7/4	4	P2	P8-2	P8-1	Movements/Display/Actuation	
(1+6) WB 5 STREET (ACTUATED)	Dwell	<G	G	R	<R	R	R	R	R	DW	DW	DW		
	Clear to	2+6	<Y	G	R	<R	R	R	R	R	DW	DW		DW
		3	<Y	Y	R	<R	R	R	R	R	DW	DW		DW
		4	<Y	Y	R	<R	R	R	R	R	DW	DW		DW
(2+6) E/WB 5 STREET (RECALL)	Dwell	<R	G	G	<R	R	R	R	R	W/F	DW	DW		
	Clear to	3	<R	Y	Y	<R	R	R	R	R	DW	DW		DW
		4	<R	Y	Y	<R	R	R	R	R	DW	DW		DW
(3) NB ALTON RD (ACTUATED)	Dwell	<R	R	R	<G	<G/G	G	R	R	DW	DW	W/F		
	Clear to	3	<R	R	R	<Y	Y	Y	R	R	DW	DW		DW
		4	<R	R	R	<Y	Y	Y	R	R	DW	DW		DW
		1+6	<R	R	R	<Y	Y	Y	R	R	DW	DW		DW
		2+6	<R	R	R	<Y	Y	Y	R	R	DW	DW		DW
(4) NB ALTON RD (ACTUATED)	Dwell	<R	R	R	<R	R	R	<G/G	G	DW	W/F	DW		
	Clear to	1+6	<R	R	R	<R	R	R	Y	Y	DW	DW		DW
		2+6	<R	R	R	<R	R	R	Y	Y	DW	DW		DW
	Dwell													
	Clear to													
			Dwell											
Clear to														
	Flashing Operation		F<R	FY	FY	F<R	FR	FR	FR	FR				Page 1 of 1
Miami-Dade County Public Works Department														
Drawn		Date		ALTON RD & 5 STREET										
William Rivera-Paz		2/3/2012												
Checked		Date		Placed in Service				Phasing No.		Asset Number				
H. Hernandez		2/13/12		Date 2/29/12 By FSS				5		2640				

TOD Schedule Report

for 2641: Alton Rd&6 St

Print Date:

1/25/2016

Print Time:

10:22 AM

<u>Asset</u>	<u>Intersection</u>	<u>TOD</u> <u>Schedule</u>	<u>Op Mode</u>	<u>Plan #</u>	<u>Cycle</u>	<u>Offset</u>	<u>TOD</u> <u>Setting</u>	<u>Active</u> <u>PhaseBank</u>	<u>Active</u> <u>Maximum</u>
2641	Alton Rd&6 St	DOW-2		N/A	0	0	N/A	0	Max 0

Splits

<u>PH 1</u>	<u>PH 2</u>	<u>PH 3</u>	<u>PH 4</u>	<u>PH 5</u>	<u>PH 6</u>	<u>PH 7</u>	<u>PH 8</u>
-	SBT	SL+PED	WBR	SBL	NBT	-	EBR
0	0	0	0	0	0	0	0
							

Active Phase Bank: Phase Bank 1

<u>Phase</u>	<u>Walk</u>	<u>Don't Walk</u>	<u>Min Initial</u>	<u>Veh Ext</u>	<u>Max Limit</u>	<u>Max 2</u>	<u>Yellow</u>	<u>Red</u>
<u>Phase Bank</u>								
	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3		
1 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
2 SBT	7 - 7 - 7	14 - 14 - 14	7 - 7 - 7	1 - 1 - 1	30 - 30 - 30	0 - 0 - 0	4	2
3 SL+P	4 - 4 - 4	30 - 30 - 30	5 - 5 - 5	2.5 - 2.5 - 2.5	8 - 8 - 8	34 - 34 - 34	4	2
4 WBR	0 - 0 - 0	0 - 0 - 0	7 - 7 - 7	2 - 2 - 2	7 - 10 - 10	10 - 20 - 20	4	2
5 SBL	0 - 0 - 0	0 - 0 - 0	5 - 5 - 5	2.5 - 2.5 - 2.5	22 - 8 - 8	15 - 20 - 20	4	2
6 NBT	7 - 7 - 7	14 - 14 - 14	7 - 7 - 7	1 - 1 - 1	30 - 30 - 30	0 - 0 - 0	4	2
7 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
8 EBR	0 - 0 - 0	0 - 0 - 0	7 - 7 - 7	2 - 2 - 2	7 - 10 - 10	10 - 20 - 20	4	2

Last In Service Date: unknown

Permitted Phases

12345678

Default -23456--
 External Permit 0 -----
 External Permit 1 -----
 External Permit 2 -----

TOD Schedule Report

for 2641: Alton Rd&6 St

Print Date:

1/25/2016

Print Time:

10:22 AM

		Green Time											
Current TOD Schedule	Plan	Cycle	1 -	2 SBT	3 SL+P	4 WBR	5 SBL	6 NBT	7 -	8 EBR	Ring Offset	Offset	
1		100	0	54	17	11	**	54	0	0	0	9	
3		120	0	74	17	11	**	74	0	0	0	16	
5		150	0	84	37	11	**	84	0	0	0	101	
10		160	0	94	37	11	**	94	0	0	0	49	
13		120	0	74	17	11	**	74	0	0	0	99	
19		120	0	74	17	11	**	74	0	0	0	114	
20		150	0	84	37	11	0	84	0	0	0	95	
21		140	0	74	37	11	0	74	0	0	0	110	
22		120	0	74	17	11	**	74	0	0	0	0	
25		140	0	74	37	11	**	74	0	0	0	7	
26		180	0	114	37	11	**	114	0	0	0	74	
27		140	0	74	37	11	**	74	0	0	0	8	

Local TOD Schedule			
Time	Plan	DOW	
0000	1	Su	M T W Th F S
0600	3		M T W Th F
0700	3		M T W Th F
0800	5		M T W Th F
0800	19	Su	
0900	5		M T W Th F
1000	20	Su	
1100	5		M T W Th F
1300	10		M T W Th F
1515	10		M T W Th F
1600	21	Su	
1900	22	Su	
1900	13		M T W Th F
2000	13		M T W Th F
2000	22	Su	

Current Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	8-----	SuM T W ThF S
0600	TOD OUTPUTS	-----	M T W ThF
2000	TOD OUTPUTS	8-----	M T W ThF

Local Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	8-----	SuM T W ThF S
0600	TOD OUTPUTS	-----	M T W ThF
0700	TOD OUTPUTS	-----	Su S
2000	TOD OUTPUTS	8-----	M T W ThF
2200	TOD OUTPUTS	8-----	Su S

* Settings

Blank - FREE - Phase Bank 1, Max 1
Blank - Plan - Phase Bank 1, Max 2
1 - Phase Bank 2, Max 1
2 - Phase Bank 2, Max 2
3 - Phase Bank 3, Max 1
4 - Phase Bank 3, Max 2
5 - EXTERNAL PERMIT 1
6 - EXTERNAL PERMIT 2
7 - X-PED OMIT
8 - TBA

No Calendar Defined/Enabled

SIGNAL OPERATING PLAN



	Direction	EB		WB		SB	NB	Ped Heads				N	
Timing Phases	Head No.	1√	6	5√	2	8	4	P2	P6	P4	P8	Movements/Display/Actuation	
(1+6) Alton Rd SB (ACTUATED)	Dwell	<G	G	<R	R	R	R	DW	W/F	DW	DW		
	C	(2+6)	<Y	G	<R	R	R	DW	DW	DW	DW		
	l												
	e												
	t												
(2+6) N/SB Alton Rd (RECALL)	Dwell	<R	G	<R	G	R	R	W/F	W/F	DW	DW		
	C	(5+2)	<R	Y	<R	G	R	R	DW	DW	DW		DW
	l	(4+8)	<R	Y	<R	Y	R	R	DW	DW	DW		DW
	e	(1+6)	<R	G	<R	Y	R	R	DW	DW	DW		DW
	t												
(5+2) NB Alton Rd (ACTUATED)	Dwell	<R	R	<G	G	R	R	W/F	DW	W/F	DW		
	C	(4+8)	<R	R	<Y	Y	R	R	DW	DW	DW		DW
	l	(1+6)	<R	R	<Y	Y	R	R	DW	DW	DW		DW
	e	(2+6)	<R	R	<Y	G	R	R	DW	DW	DW		DW
	t												
(4+8) E/WB 6 Street (ACTUATED)	Dwell	<R	R	<R	R	G	G	DW	DW	DW	W/F		
	C	(1+6)	<R	R	<R	R	Y	Y	DW	DW	DW		DW
	l	(2+6)	<R	R	<R	R	Y	Y	DW	DW	DW		DW
	e												
	t												
	Dwell												
	C												
	l												
	e												
	t												
	Dwell												
	C												
	l												
	e												
	t												
Flashing Operation		F<R	FY	f<R	FY	FR	FR					Page 1 of 1	
Miami-Dade County Public Works Department													
Drawn William Rivera-Paz		Date 8/25/2011		Alton Rd & 6 St									
Checked H. Hernandez		Date 9/1/11		Placed in Service Date 8/15/11 By S.V.V.			Phasing No. 4			Asset Number 2641			

TOD Schedule Report for 2734: Lenox Av&5 St

Print Date:
1/25/2016

Print Time:
10:34 AM

<u>Asset</u>	<u>Intersection</u>	<u>TOD Schedule</u>	<u>Op Mode</u>	<u>Plan #</u>	<u>Cycle</u>	<u>Offset</u>	<u>TOD Setting</u>	<u>Active PhaseBank</u>	<u>Active Maximum</u>
2734	Lenox Av&5 St	DOW-2		N/A	0	0	N/A	0	Max 0

Splits

<u>PH 1</u>	<u>PH 2</u>	<u>PH 3</u>	<u>PH 4</u>	<u>PH 5</u>	<u>PH 6</u>	<u>PH 7</u>	<u>PH 8</u>
EBL	WBT	-	NBT	-	EBT	-	SBT
0	0	0	0	0	0	0	0
							

Active Phase Bank: Phase Bank 1

<u>Phase</u>	<u>Walk</u>	<u>Don't Walk</u>	<u>Min Initial</u>	<u>Veh Ext</u>	<u>Max Limit</u>	<u>Max 2</u>	<u>Yellow</u>	<u>Red</u>
<u>Phase Bank</u>								
	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3		
1 EBL	0 - 0 - 0	0 - 0 - 0	5 - 5 - 5	2 - 2 - 2	5 - 5 - 5	25 - 20 - 20	3	0
2 WBT	5 - 5 - 5	12 - 12 - 12	7 - 7 - 7	1 - 1 - 1	55 - 55 - 55	0 - 0 - 0	4	2
3 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
4 NBT	4 - 4 - 4	28 - 28 - 28	7 - 7 - 7	2.5 - 2.5 - 2.5	12 - 12 - 12	14 - 18 - 22	4	2.5
5 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
6 EBT	5 - 5 - 5	12 - 12 - 12	7 - 7 - 7	1 - 1 - 1	55 - 55 - 55	0 - 0 - 0	4	2
7 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
8 SBT	4 - 4 - 4	28 - 28 - 28	7 - 7 - 7	2.5 - 2.5 - 2.5	12 - 12 - 12	14 - 18 - 22	4	2.5

Last In Service Date: unknown

Permitted Phases

12345678

Default 12-4-6-8
External Permit 0 -2-4-6-8
External Permit 1 -2-4-6-8
External Permit 2 -2-4-6-8

TOD Schedule Report
for 2734: Lenox Av&5 St

Print Date:
1/25/2016

Print Time:
10:34 AM

Current TOD Schedule	Plan	Cycle	Green Time								Ring Offset	Offset
			1 EBL	2 WBT	3 -	4 NBT	5 -	6 EBT	7 -	8 SBT		
1		120	20	52	0	33	0	75	0	33	0	6
2		150	20	82	0	33	0	105	0	33	0	49
3		120	20	52	0	33	0	75	0	33	0	108
4		150	20	82	0	33	0	105	0	33	0	85
5		150	20	82	0	33	0	105	0	33	0	40
6		180	20	112	0	33	0	135	0	33	0	137
7		170	20	102	0	33	0	125	0	33	0	15
8		160	20	92	0	33	0	115	0	33	0	72
10		160	11	101	0	33	0	115	0	33	0	50
14		120	20	52	0	33	0	75	0	33	0	14
15		130	20	62	0	33	0	85	0	33	0	15
16		120	20	52	0	33	0	75	0	33	0	12
17		130	20	62	0	33	0	85	0	33	0	106
22		110	9	54	0	32	0	66	0	32	0	33
23		110	9	37	0	49	0	49	0	49	0	5
24		180	9	107	0	49	0	119	0	49	0	56
25		140	9	67	0	49	0	79	0	49	0	56
26		180	9	107	0	49	0	119	0	49	0	57
27		140	9	67	0	49	0	79	0	49	0	12

Local TOD Schedule

Time	Plan	DOW
0000	3	Su M T W Th F S
0500	2	M T W Th F
0500	3	Su
0800	6	M T W Th F
1000	7	Su
1130	5	M T W Th F
1300	6	M T W Th F
1615	7	M T W Th F
1845	8	M T W Th F
2000	4	Su

Current Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	-----	Su M T W Th F S
0500	TOD OUTPUTS	-----2-	M T W Th F
1500	TOD OUTPUTS	-----	M T W Th F
1500	TOD OUTPUTS	----4---	M T W Th F
1800	TOD OUTPUTS	-----	M T W Th F
2200	TOD OUTPUTS	-----	M T W Th F

Local Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	-----	Su M T W Th F S
0500	TOD OUTPUTS	-----2-	M T W Th F
0700	TOD OUTPUTS	-----1	Su
0800	TOD OUTPUTS	-----	S
1000	TOD OUTPUTS	-----	Su
1500	TOD OUTPUTS	-----	M T W Th F
1500	TOD OUTPUTS	----4---	M T W Th F
1800	TOD OUTPUTS	-----	M T W Th F
1900	TOD OUTPUTS	-----	Su
2200	TOD OUTPUTS	-----	M T W Th F

*** Settings**

Blank - FREE - Phase Bank 1, Max 1
Blank - Plan - Phase Bank 1, Max 2
1 - Phase Bank 2, Max 1
2 - Phase Bank 2, Max 2
3 - Phase Bank 3, Max 1
4 - Phase Bank 3, Max 2
5 - EXTERNAL PERMIT 1
6 - EXTERNAL PERMIT 2
7 - X-PED OMIT
8 - TBA

No Calendar Defined/Enabled

TOD Schedule Report
for 2752: Michigan Av&5 St

Print Date:
1/25/2016

Print Time:
10:36 AM

<u>Asset</u>	<u>Intersection</u>	<u>TOD Schedule</u>	<u>Op Mode</u>	<u>Plan #</u>	<u>Cycle</u>	<u>Offset</u>	<u>TOD Setting</u>	<u>Active PhaseBank</u>	<u>Active Maximum</u>
2752	Michigan Av&5 St	DOW-2		N/A	0	0	N/A	0	Max 0

Splits

<u>PH 1</u>	<u>PH 2</u>	<u>PH 3</u>	<u>PH 4</u>	<u>PH 5</u>	<u>PH 6</u>	<u>PH 7</u>	<u>PH 8</u>
EBL	WBT	-	NBT	WBL	EBT	-	SBT
0	0	0	0	0	0	0	0
							

Active Phase Bank: Phase Bank 1

<u>Phase</u>	<u>Walk</u>	<u>Don't Walk</u>	<u>Min Initial</u>	<u>Veh Ext</u>	<u>Max Limit</u>	<u>Max 2</u>	<u>Yellow</u>	<u>Red</u>
<u>Phase Bank</u>								
	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3		
1 EBL	0 - 0 - 0	0 - 0 - 0	5 - 5 - 5	2 - 2 - 2	12 - 5 - 5	30 - 25 - 25	3.7	2
2 WBT	5 - 5 - 5	12 - 12 - 12	5 - 5 - 5	1 - 1 - 1	30 - 30 - 30	0 - 30 - 30	4	2
3 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
4 NBT	5 - 5 - 5	29 - 29 - 29	7 - 7 - 7	2.5 - 2.5 - 2.5	8 - 8 - 12	14 - 20 - 18	4	2.5
5 WBL	0 - 0 - 0	0 - 0 - 0	5 - 5 - 5	2 - 2 - 2	5 - 5 - 5	16 - 12 - 12	3.7	2.5
6 EBT	5 - 5 - 5	12 - 12 - 12	5 - 5 - 5	1 - 1 - 1	30 - 30 - 30	0 - 30 - 30	4	2
7 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
8 SBT	5 - 5 - 5	29 - 29 - 29	7 - 7 - 7	2.5 - 2.5 - 2.5	8 - 8 - 12	14 - 20 - 18	4	2.5

Last In Service Date: unknown

Permitted Phases

12345678

Default 12-456-8
External Permit 0 -----
External Permit 1 -----
External Permit 2 -----

TOD Schedule Report
for 2752: Michigan Av&5 St

Print Date:
1/25/2016

Print Time:
10:36 AM

Current TOD Schedule	Plan	Cycle	Green Time								Ring Offset	Offset
			1 EBL	2 WBT	3 -	4 NBT	5 WBL	6 EBT	7 -	8 SBT		
1		120	17	36	0	49	8	44	0	49	0	15
2		150	12	66	0	54	5	72	0	54	0	39
3		120	12	36	0	54	5	42	0	54	0	104
4		150	12	66	0	54	5	72	0	54	0	76
5		150	12	66	0	54	5	72	0	54	0	33
6		180	12	96	0	54	5	102	0	54	0	128
7		170	12	86	0	54	5	92	0	54	0	167
8		160	12	76	0	54	5	82	0	54	0	58
10		80	6	19	0	36	6	19	0	36	0	0
14		120	12	36	0	54	5	42	0	54	0	9
15		130	20	43	0	49	16	47	0	49	0	4
16		120	12	36	0	54	5	42	0	54	0	7
22		110	12	26	0	54	5	32	0	54	0	14
23		110	12	26	0	54	5	32	0	54	0	109
25		140	12	56	0	54	5	62	0	54	0	54
26		180	12	96	0	54	5	102	0	54	0	54
27		140	12	56	0	54	5	62	0	54	0	18

Local TOD Schedule

Time	Plan	DOW
0000	3	Su M T W Th F S
0500	2	M T W Th F
0500	3	Su
0800	6	M T W Th F
1000	7	Su
1130	5	M T W Th F
1300	6	M T W Th F
1615	7	M T W Th F
1845	8	M T W Th F
2000	4	Su

Current Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	8-----	SuM T W ThF S
0600	TOD OUTPUTS	-----	M T W ThF
1800	TOD OUTPUTS	8-----	M T W ThF

Local Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	8-----	SuM T W ThF S
0600	TOD OUTPUTS	-----	M T W ThF
0700	TOD OUTPUTS	-----1	Su S
0800	TOD OUTPUTS	-----	S
1000	TOD OUTPUTS	-----	Su
1800	TOD OUTPUTS	8-----	M T W ThF
1900	TOD OUTPUTS	8-----	Su S

*** Settings**

Blank - FREE - Phase Bank 1, Max 1
Blank - Plan - Phase Bank 1, Max 2
1 - Phase Bank 2, Max 1
2 - Phase Bank 2, Max 2
3 - Phase Bank 3, Max 1
4 - Phase Bank 3, Max 2
5 - EXTERNAL PERMIT 1
6 - EXTERNAL PERMIT 2
7 - X-PED OMIT
8 - TBA

No Calendar Defined/Enabled

↑ N

Blank12

Peak Season Conversion Factor

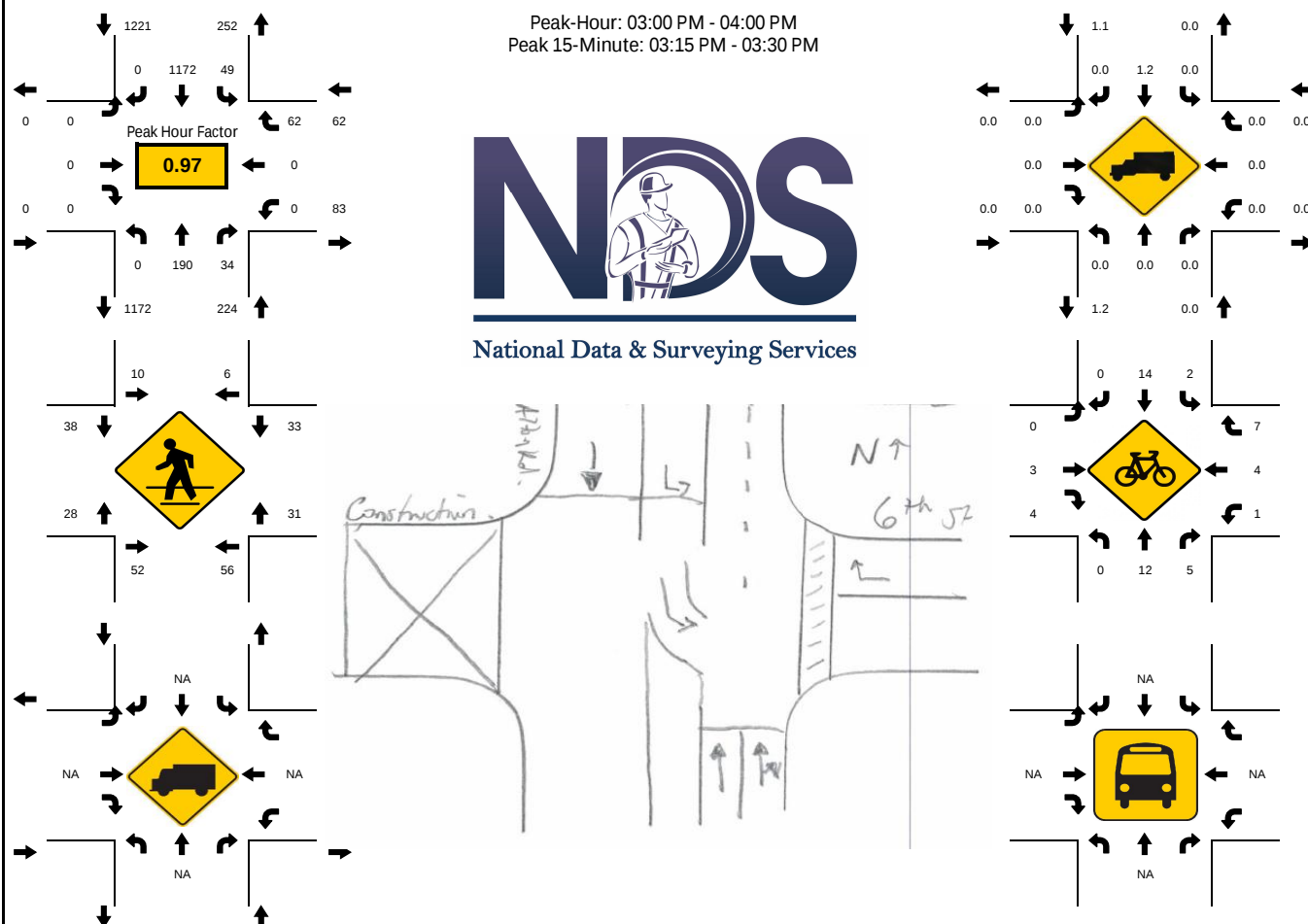
MacArthur Causeway Peak Season Conversion Factor									
Week	Weekly Volume	PSCF	Month	Days	Week	Weekly Volume	PSCF	Month	Days
1	84502	1.24	January	1-4	27			July	1-5
2	96698	1.08		7-11	28	91188	1.15		8-12
3	92890	1.13		14-18	29	79614	1.32		15-19
4	87868	1.19		21-25	30	82290	1.27		22-26
5	93601	1.12		28-31	31	80496	1.30		29-31
6	93618	1.12	February	1-8	32	84340	1.24	August	1-9
7	97021	1.08		11-15	33	87382	1.20		12-16
8	95629	1.10		18-22	34	88768	1.18		19-23
9	93869	1.12		25-28	35	86855	1.21		26-30
10	98171	1.07	March	1-8	36	85645	1.22	September	2-6
11	103387	1.01		11-15	37	85048	1.23		9-13
12	104829	1.00		18-22	38	85223	1.23		16-20
13	100316	1.04		25-29	39	87485	1.20		23-30
14	92939	1.13	April	1-5	40	87248	1.20	October	1-4
15	94095	1.11		8-12	41	89149	1.18		7-11
16	92560	1.13		15-19	42	91419	1.15		14-18
17	93979	1.12		22-30	43	89444	1.17		21-25
18	92123	1.14	May	1-3	44	91676	1.14	November	28-31
19	94034	1.11		6-10	45	91660	1.14		1-8
20	94299	1.11		13-17	46	88852	1.18		11-15
21	87019	1.20		20-24	47	86189	1.22		18-22
22	83929	1.25		27-31	48	82268	1.27		25-29
23	86256	1.22	June	3-7	49	96359	1.09	December	2-6
24	82286	1.27		10-14	50	90945	1.15		9-13
25	94499	1.11		17-21	51	91048	1.15		16-20
26	85009	1.23		24-28	52	82311	1.27		23-31

96-hour Continuous Count

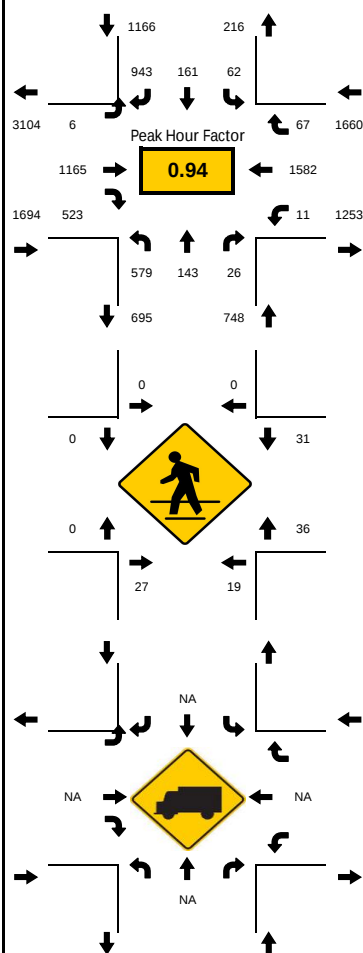
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IM	Perio	EB	WB	NB	SB	EB-Hr	WB-Hr	NB-Hr	SB-Hr	Total	IM	Perio	EB	WB	NB	SB	EB-Hr	WB-Hr	NB-Hr	SB-Hr	Total	IM	Perio	EB	WB	NB	SB	EB-Hr	WB-Hr	NB-Hr	SB-Hr	Total	IM	Perio	EB	WB	NB	SB	EB-Hr	WB-Hr	NB-Hr	SB-Hr	Total	Day 1	Day 2	Day 3	Day 4
00:00	88	209	8	9	311	691	22	27	1051		00:00	183	198	18	12		538	731	46	42	1357	00:00	192	321	34	17		818	1178	144	98	2238	00:00	230	319	28	22		877	1248	138	86	2349	1910	2282	4001	4473
00:15	75	170	7	10	309	644	19	29	1001		00:15	150	190	12	14		470	673	32	42	1217	00:15	220	296	36	25		789	1116	148	104	2157	00:15	188	308	36	16		858	1250	147	88	2343	1737	2033	3830	4332
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Turning Movement Counts

PROJECT ID: 16-3039-001
DATE: Thu, Feb 18, 2016

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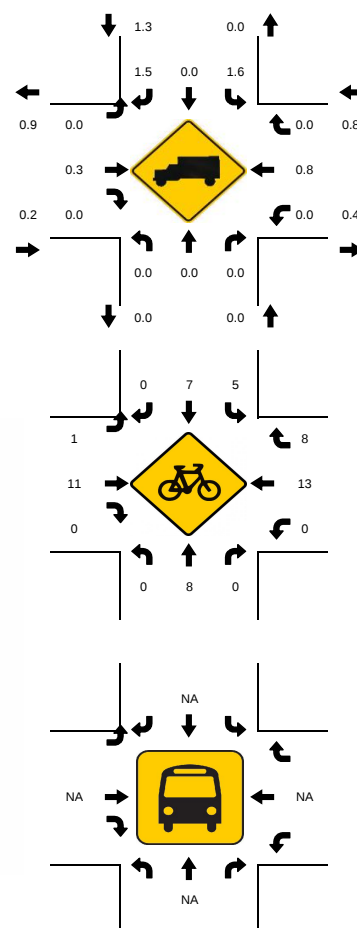
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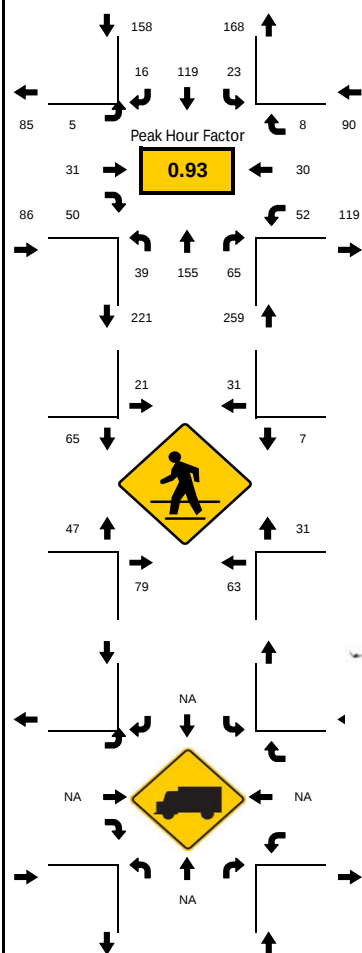
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National Data & Surveying Services

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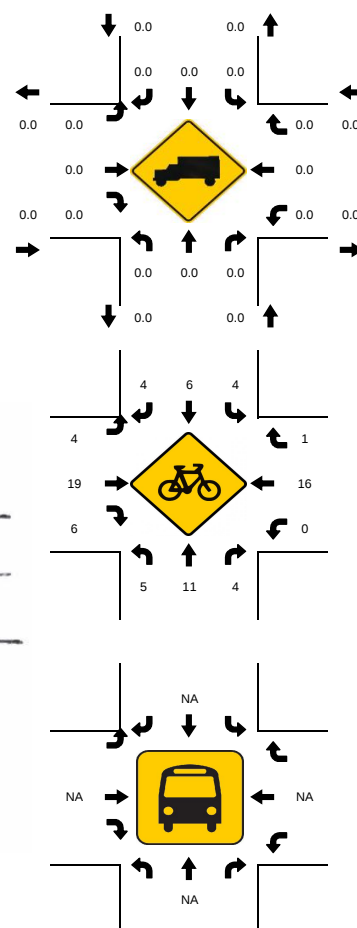
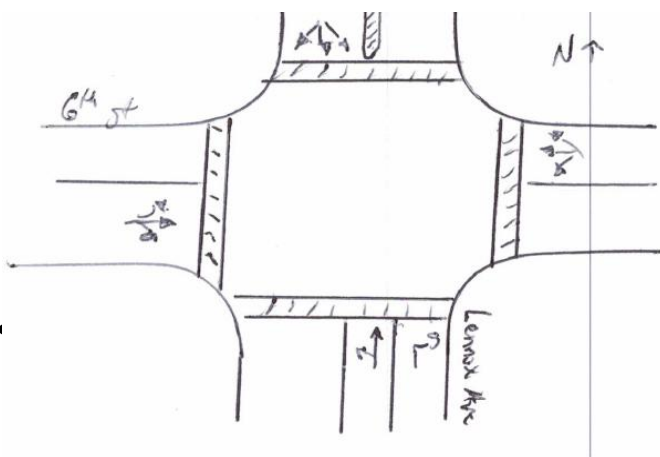
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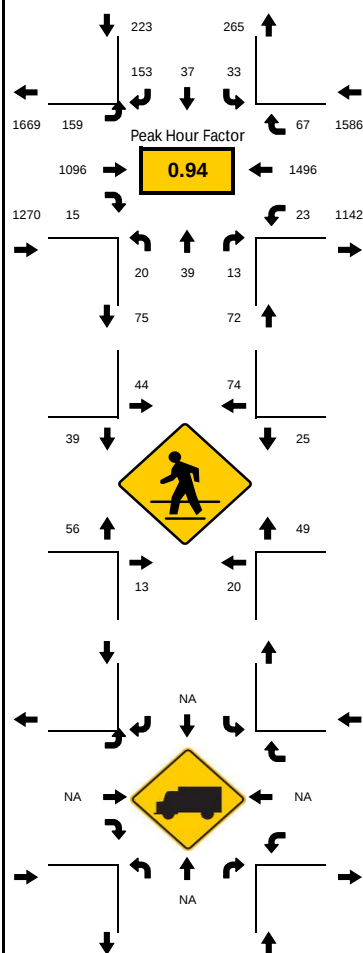
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National Data & Surveying Services

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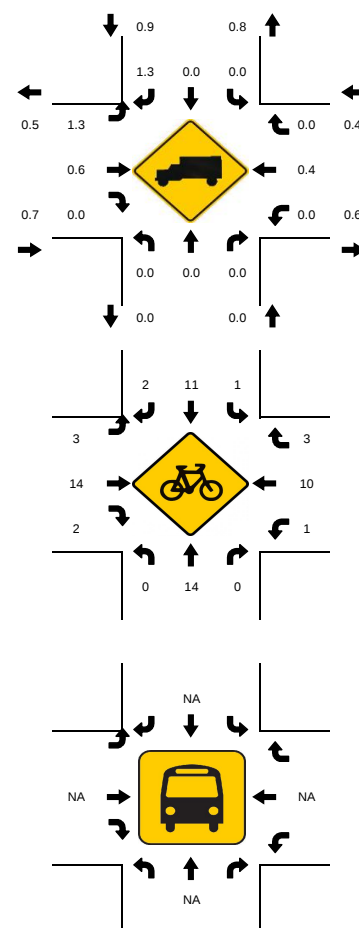
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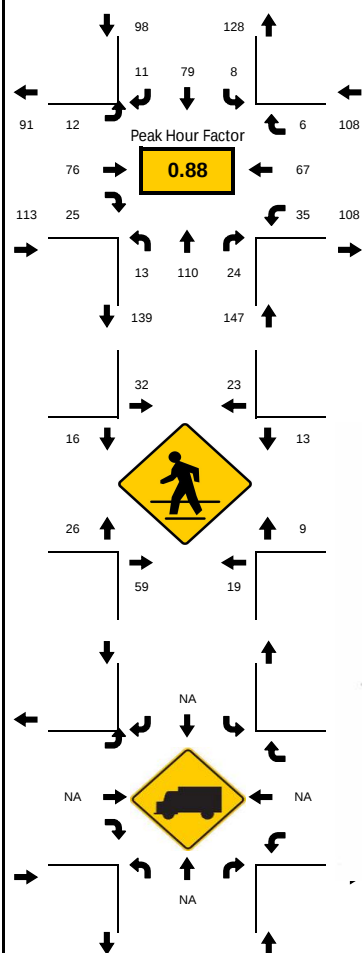
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National Data & Surveying Services

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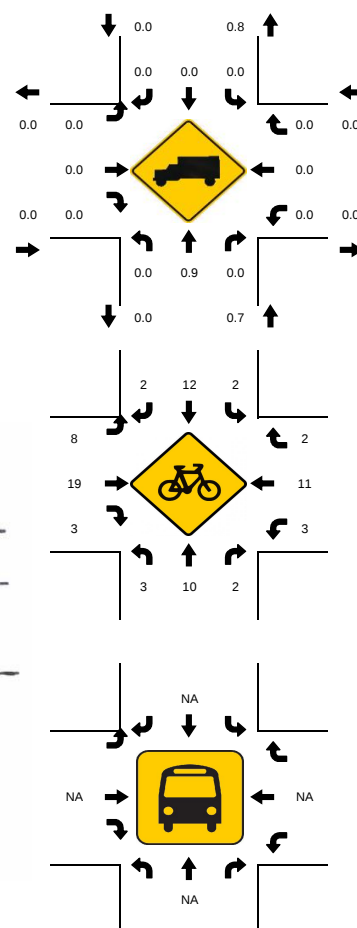
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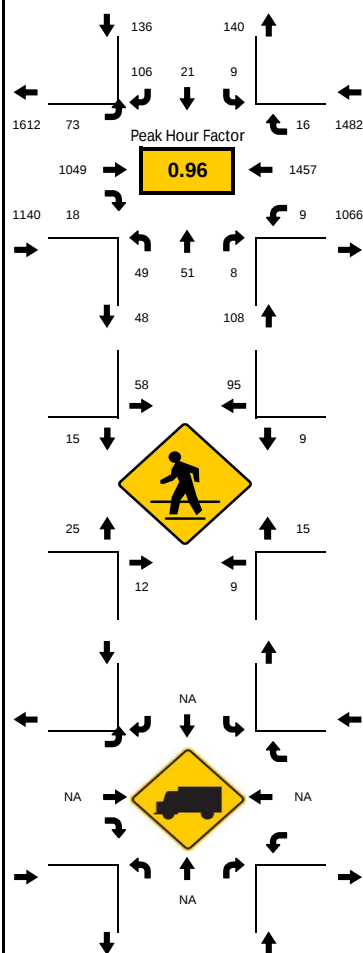
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National Data & Surveying Services

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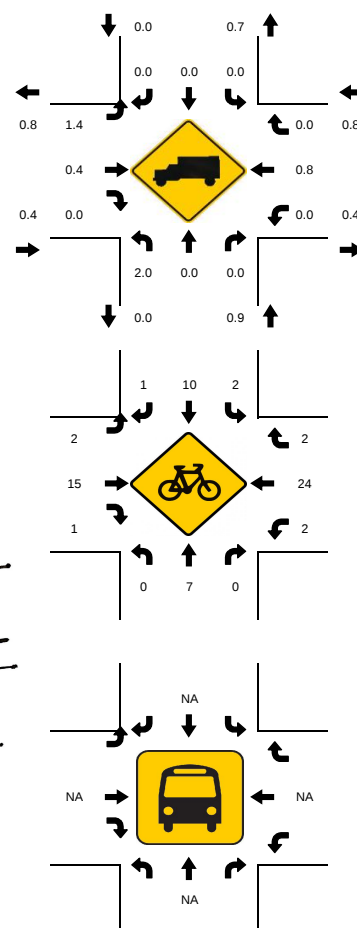
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DATE: Thu, Feb 18, 2016



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National Data & Surveying Services

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APPENDIX D: Background Area Growth

Historical Growth Trend Analysis

FDOT Growth Rate Summary

Station Number	Location	Historic Growth	
		5-year	10-year
872527	SR A1A/MACARTHUR CSWY -- 200' West of SR 907/ALTON RD	5.75%	0.97%
872528	SR A1A/MACARTHUR CSWY -- 150' North of MERIDIAN AVE	-1.43%	-1.15%
	Total	2.16%	-0.09%

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2014 HISTORICAL AADT REPORT

COUNTY: 87 - MIAMI-DADE

SITE: 2527 - SR A1A/MACARTHUR CSWY, 200' W SR 907/ALTON RD

YEAR	AADT		DIRECTION 1		DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
----	-----		-----		-----	-----	-----	-----
2014	85000	C	E 42500		W 42500	9.00	54.30	5.10
2013	83000	C	E 42500		W 40500	9.00	54.10	6.10
2012	83500	C	E 41000		W 42500	9.00	53.40	8.40
2011	80000	C	E 39500		W 40500	9.00	51.90	7.50
2010	66000	C	E 36000		W 30000	7.16	52.27	8.80
2009	68500	C	E 36500		W 32000	9.21	57.60	8.40
2008	72500	C	E 36500		W 36000	7.42	52.15	5.30
2007	79500	C	E 40000		W 39500	7.11	53.51	4.90
2006	80500	C	E 39500		W 41000	7.18	52.50	2.20
2005	78000	C	E 40000		W 38000	7.30	52.50	5.50
2004	91500	C	E 46000		W 45500	7.40	52.00	8.20
2003	74000	C	E 36500		W 37500	7.30	54.00	4.90
2002	86000	C	E 43000		W 43000	9.20	68.00	2.60
2001	83000	C	E 41000		W 42000	8.20	53.50	3.00
2000	77500	C	E 38000		W 39500	8.20	53.10	3.50
1999	75000	C	E 42000		W 33000	9.10	52.70	3.20

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; F = FOURTH YEAR ESTIMATE
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
 *K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

TRAFFIC TRENDS

SR A1A/MACARTHUR CSWY -- 200' WEST OF SR 907/ALTON RD

County:

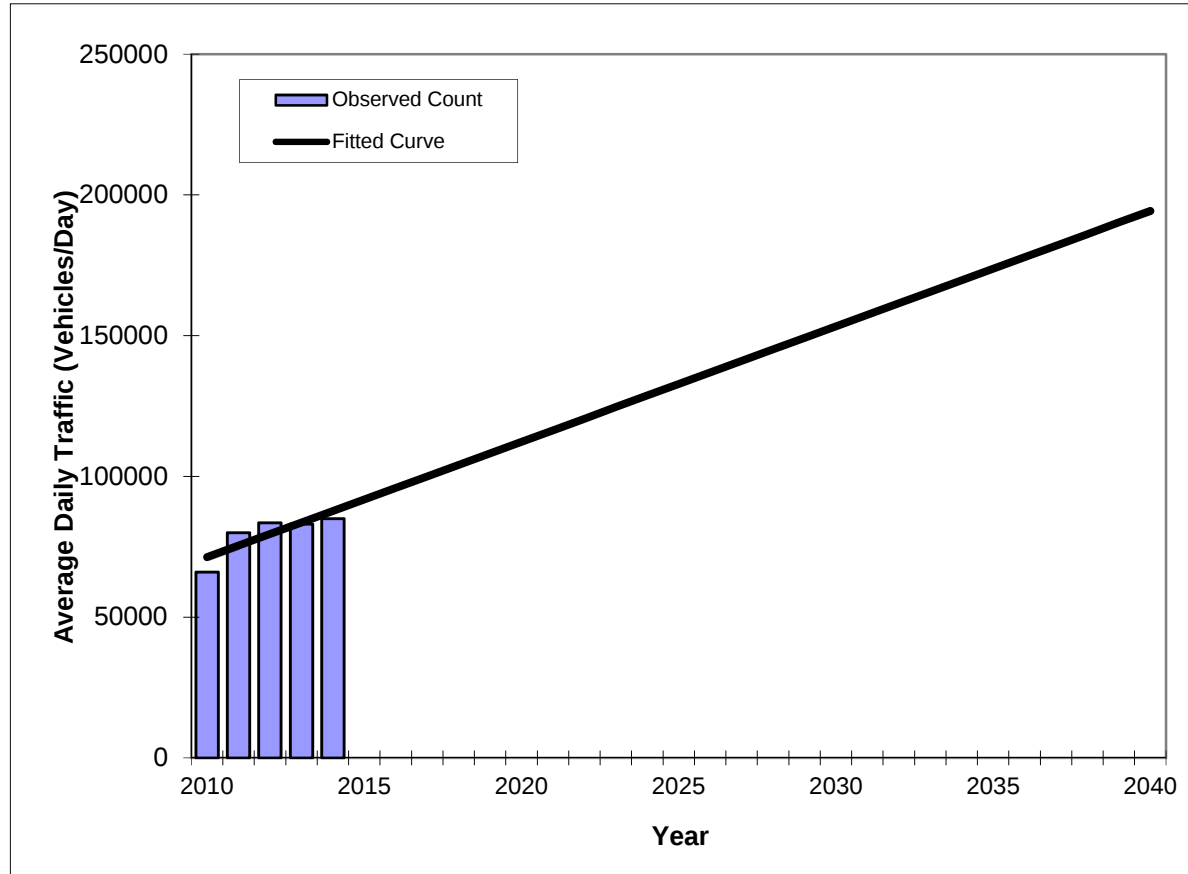
Miami-Dade

Station #:

872527

Highway:

SR A1A/MACARTHUR CSWY



Year	Traffic (ADT/AADT)	
	Count*	Trend**
2010	66000	71300
2011	80000	75400
2012	83500	79500
2013	83000	83600
2014	85000	87700

** Annual Trend Increase: 4,100
Trend Annual Historic Growth Rate: 5.75%
Printed: 13-Jul-16

Straight Line Growth Option

*Axle-Adjusted

TRAFFIC TRENDS

SR A1A/MACARTHUR CSWY -- 200' WEST OF SR 907/ALTON RD

County:

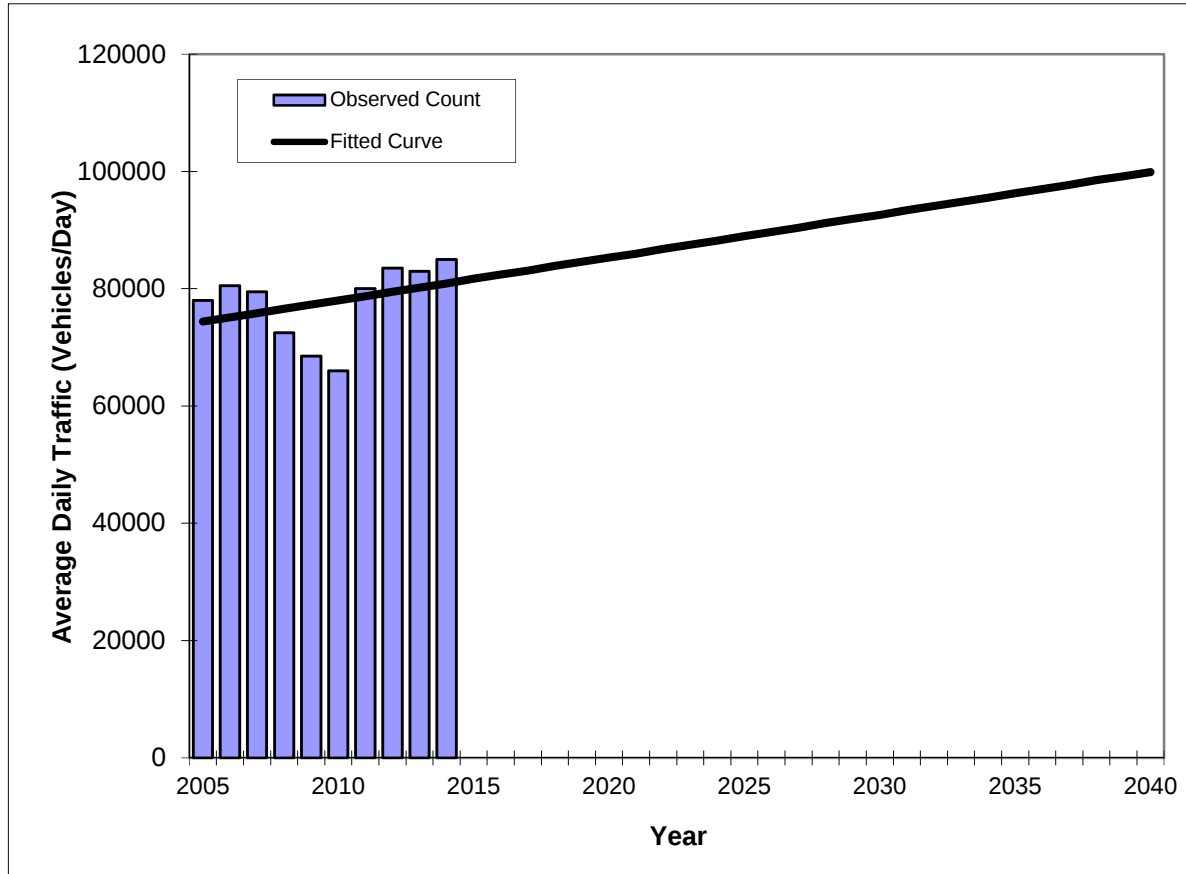
Miami-Dade

Station #:

872527

Highway:

SR A1A/MACARTHUR CSWY



Year	Traffic (ADT/AADT)	
	Count*	Trend**
2005	78000	74400
2006	80500	75100
2007	79500	75800
2008	72500	76600
2009	68500	77300
2010	66000	78000
2011	80000	78700
2012	83500	79500
2013	83000	80200
2014	85000	80900

** Annual Trend Increase: 730

Trend Annual Historic Growth Rate: 0.97%

Printed: 13-Jul-16

Straight Line Growth Option

*Axle-Adjusted

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2014 HISTORICAL AADT REPORT

COUNTY: 87 - MIAMI-DADE

SITE: 2528 - SR A1A/MACARTHUR CSWY, 150' N OF MERIDIAN AVE

YEAR	AADT		DIRECTION 1		DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
----	-----		-----		-----	-----	-----	-----
2014	33000	C	E 17000		W 16000	9.00	54.30	5.10
2013	34000	C	E 17500		W 16500	9.00	54.10	6.10
2012	32500	C	E 14500		W 18000	9.00	53.40	8.40
2011	35000	C	E 16500		W 18500	9.00	51.90	7.50
2010	35000	C	E 16500		W 18500	7.16	52.27	8.80
2009	35500	C	E 16500		W 19000	9.21	57.60	8.40
2008	34500	C	E 16000		W 18500	7.42	52.15	5.30
2007	34000	C	E 16500		W 17500	7.11	53.51	4.90
2006	40500	C	E 19500		W 21000	7.18	52.50	2.20
2005	35000	C	E 16000		W 19000	7.30	52.50	5.50
2004	41500	C	E 20500		W 21000	7.40	52.00	8.20
2003	40500	C	E 18500		W 22000	7.30	54.00	4.90
2002	43500	C	E 21000		W 22500	9.20	68.00	2.60
2001	45500	C	E 22000		W 23500	8.20	53.50	3.00
2000	37000	C	E 18500		W 18500	8.20	53.10	3.50
1999	46000	C	E 24500		W 21500	9.10	52.70	3.20

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; F = FOURTH YEAR ESTIMATE
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
 *K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

TRAFFIC TRENDS

SR A1A/MACARTHUR CSWY -- 150' NORTH OF MERIDIAN AVE

County:

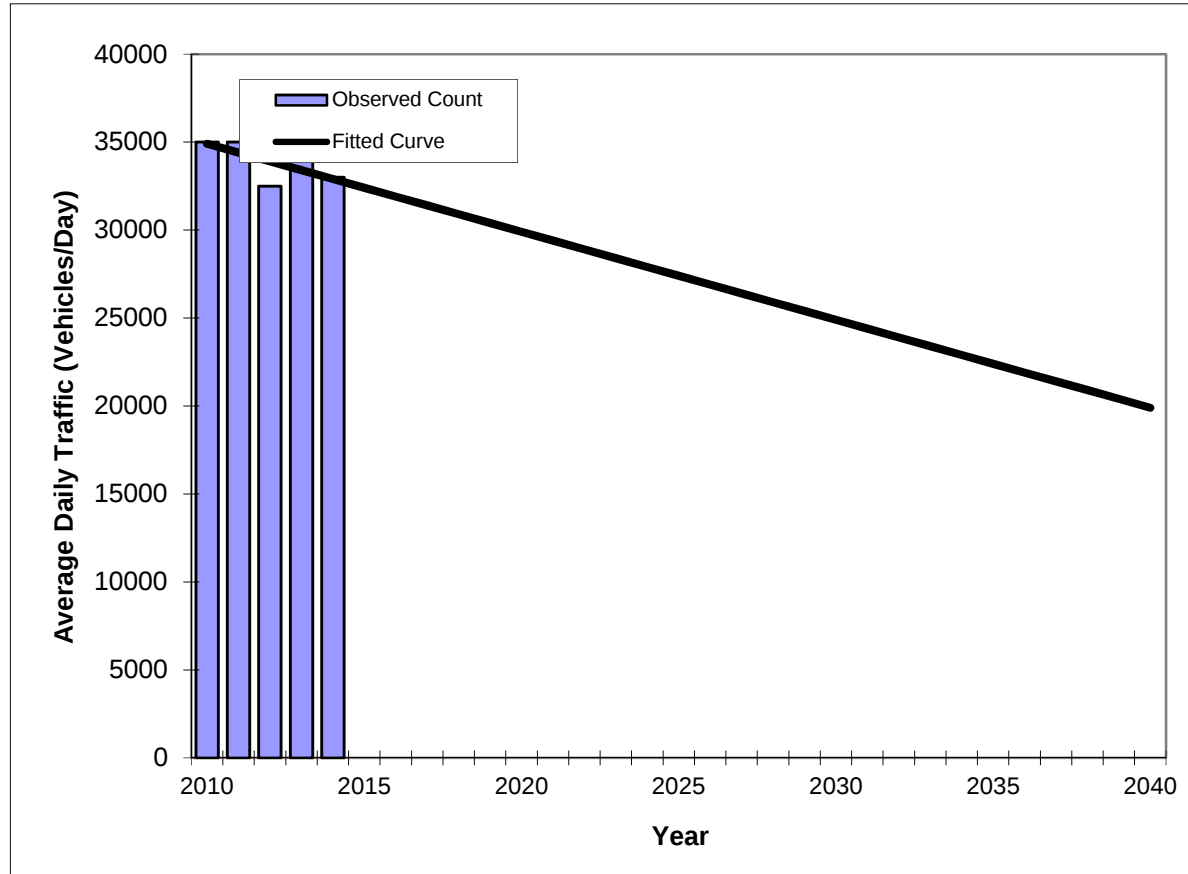
Miami-Dade

Station #:

872528

Highway:

SR A1A/MACARTHUR CSWY



Year	Traffic (ADT/AADT)	
	Count*	Trend**
2010	35000	34900
2011	35000	34400
2012	32500	33900
2013	34000	33400
2014	33000	32900

** Annual Trend Increase: -500

Trend Annual Historic Growth Rate: -1.43%

Printed: 13-Jul-16

Straight Line Growth Option

*Axle-Adjusted

TRAFFIC TRENDS

SR A1A/MACARTHUR CSWY -- 150' NORTH OF MERIDIAN AVE

County:

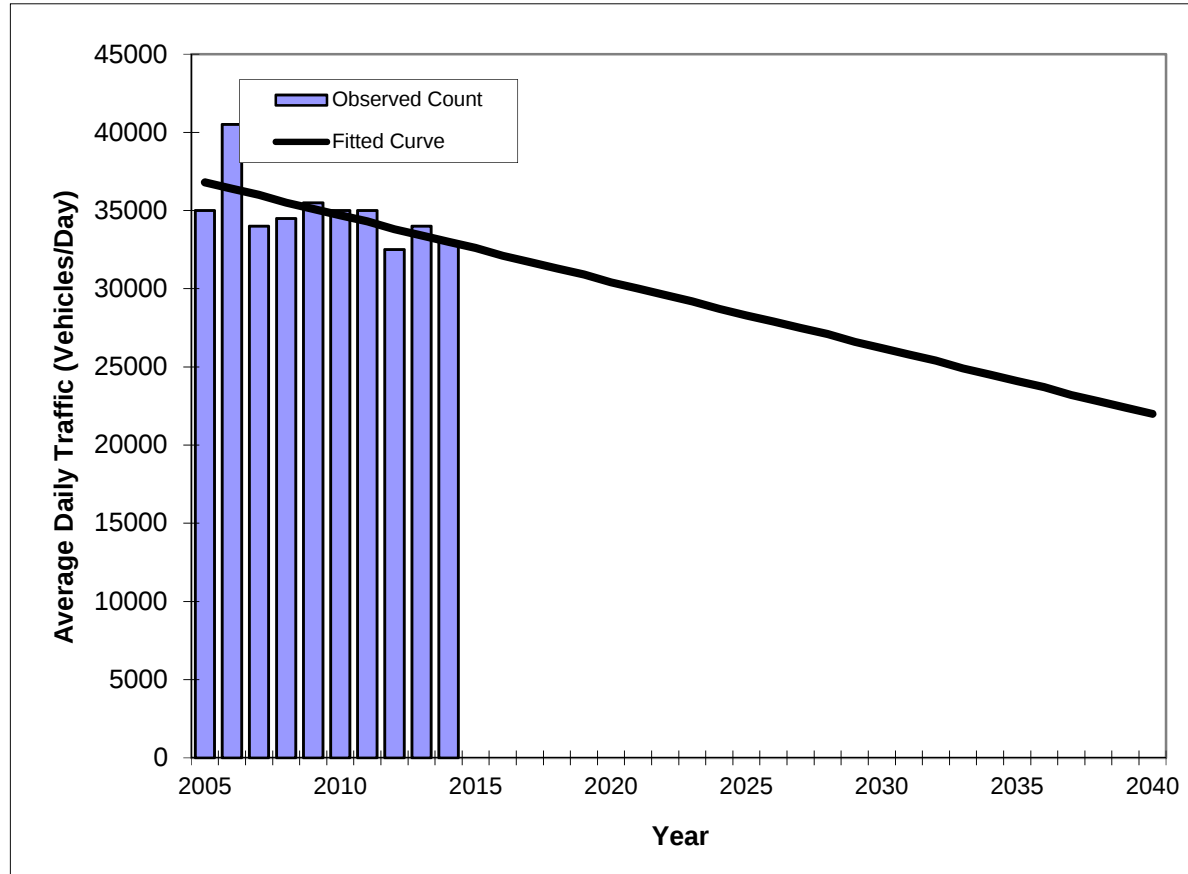
Miami-Dade

Station #:

872528

Highway:

SR A1A/MACARTHUR CSWY



Year	Traffic (ADT/AADT)	
	Count*	Trend**
2005	35000	36800
2006	40500	36400
2007	34000	36000
2008	34500	35500
2009	35500	35100
2010	35000	34700
2011	35000	34300
2012	32500	33800
2013	34000	33400
2014	33000	33000

** Annual Trend Increase: -424

Trend Annual Historic Growth Rate: -1.15%

Printed: 13-Jul-16

Straight Line Growth Option

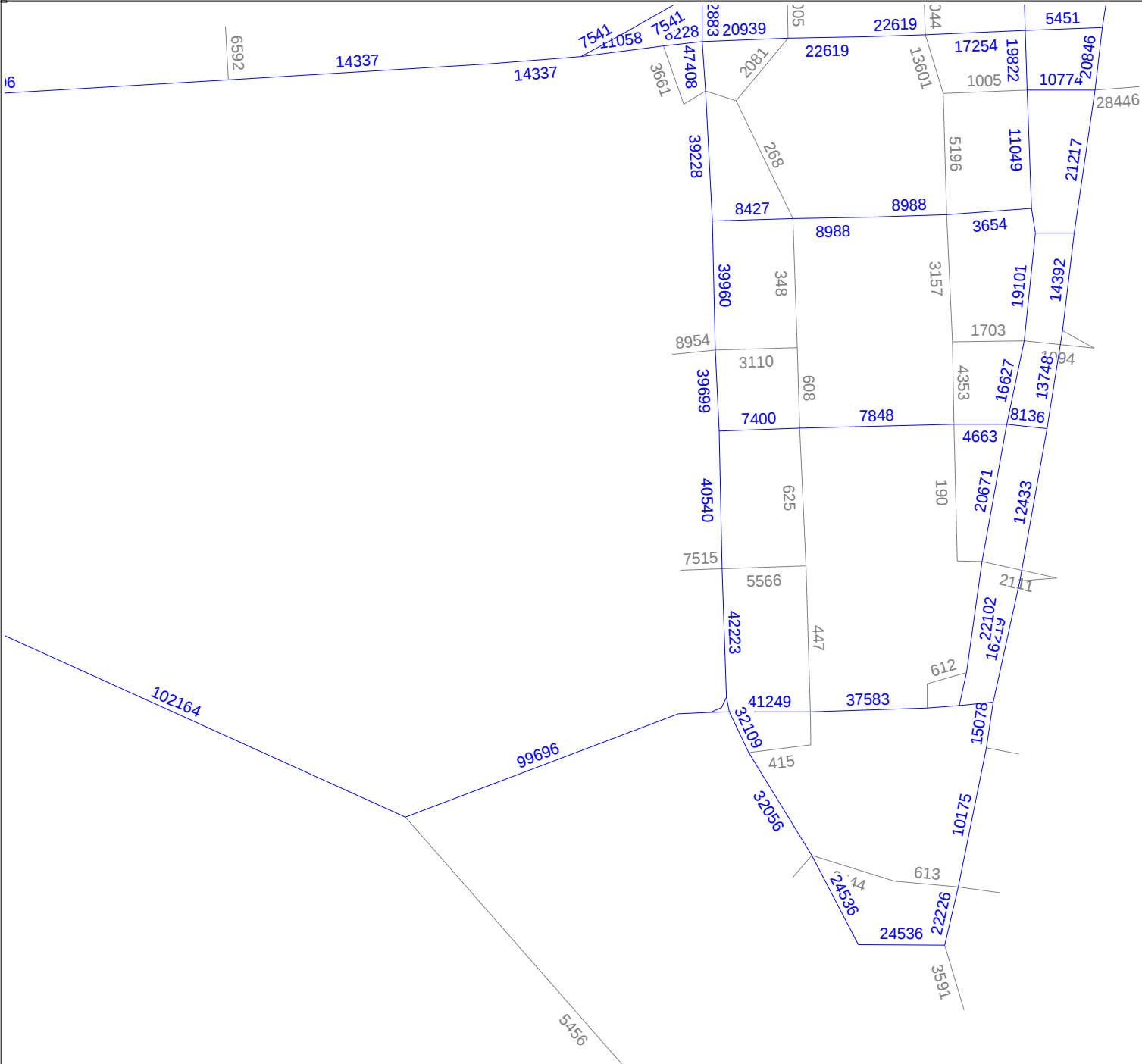
*Axle-Adjusted

Florida Standard Urban Transportation Model
Structure (FSUTMS) Southeast Florida Regional
Planning Model (SERPM) Growth Trend
Analysis

SERPM Growth Rate Summary

Street Name	2010	2040	Difference	Growth Rate	Annual Growth Rate
5 th Street/SR A1A West of Lenox Avenue	34,505	41,249	6,744	19.54%	0.65%
5 th Street/SR A1A East of Lenox Avenue	30,877	37,583	6,706	21.72%	0.72%
Alton Road North of 5th Street/SR A1A	36,469	42,223	5,754	15.78%	0.53%
Alton Road South of 5th Street/SR A1A	29,532	32,109	2,577	8.73%	0.29%
Total	131,383	153,164	21,781	16.58%	0.55%

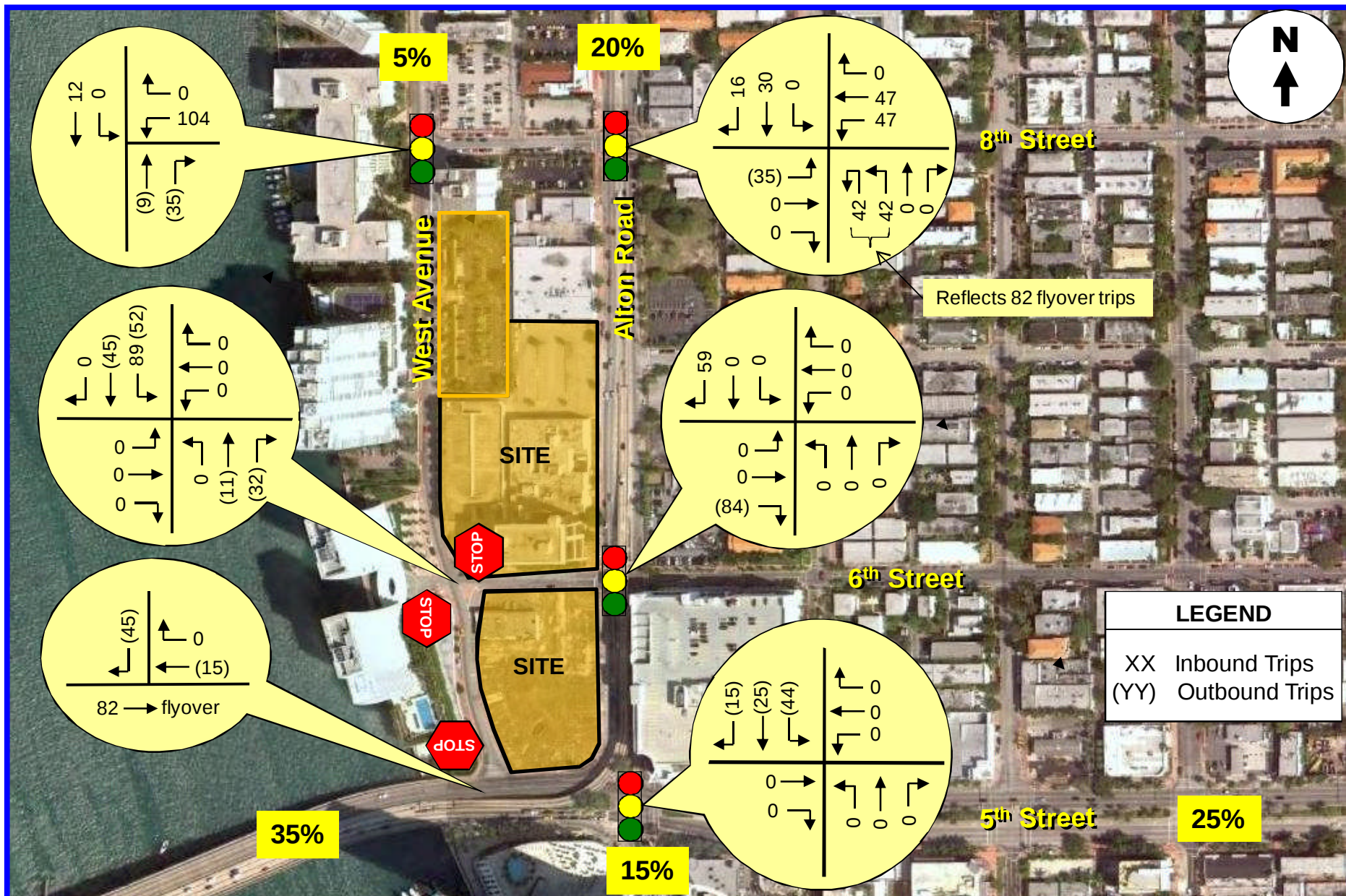
Lenox and 5th Steet 2040 Volumes SERPM 7.051



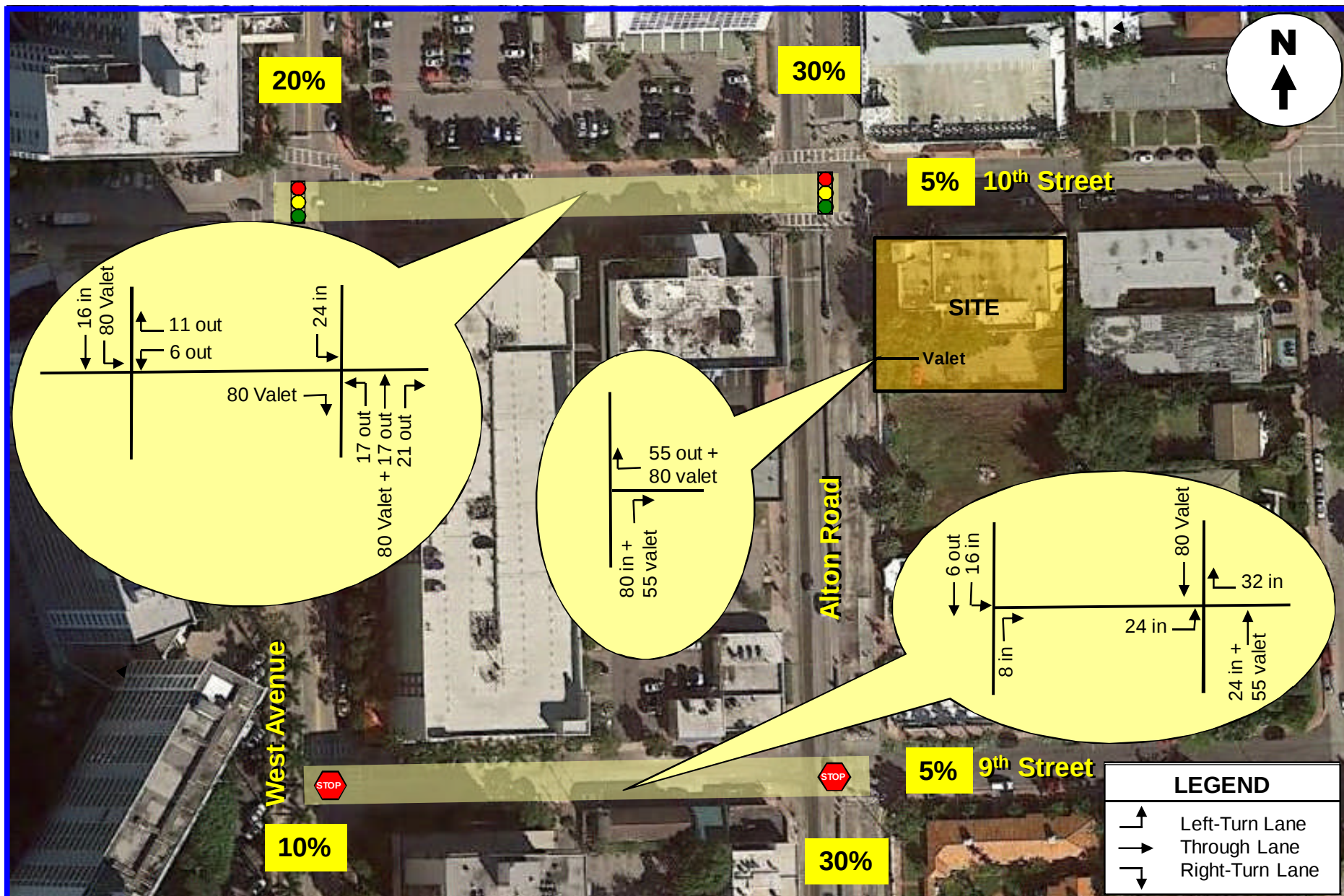
APPENDIX E:

Committed Developments

600 Alton Road



Coco Bambu



Urban Box Self Storage

INTRODUCTION

DESMAN Associates has prepared the following calculations for the proposed self-storage unit development at 633 Alton Road (the project) in Miami Beach, Florida, proposed by Alton 633 Properties, LLC (owner). It is our understanding that the size of the development is about 335 units and about 22,500 square feet (SF) of gross floor area (GFA). This memorandum is simply an application of data provided by the Institute of Transportation Engineers (ITE) and does not include specific recommendations, site review and/or other studies.

The first part of this memorandum provides an evaluation of the parking supply/demand characteristics of self-storage units and the second part provides an evaluation of the traffic generation characteristics of self-storage units, specifically as they apply to the project.

Parking Supply/Demand

The Institute of Transportation Engineers (ITE) Parking Generation Manual¹ was consulted to determine the typical parking generation rate at self-storage units. ITE "Land Use 151: Mini-Warehouse" was the category that best fit the proposed development type. Mini-warehouses as defined by ITE include buildings in which a number of storage units or vaults are rented for the storage of goods. They are typically referred to as "self-storage" facilities. Each unit is physically separated from other units and access is usually provided through an overhead door or other common access point.

Excerpts from the Parking Generation Manual are attached to this memorandum for reference purposes only and are summarized below as it pertains to the proposed development. The Manual provides data on:

1. The *average parking supply ratio* at existing sites (2 sites);
2. The *average weekday peak hour parking demand* for 100 storage units with no information available on size of units (6 sites);
3. The *average weekday peak hour parking demand* for self-storage units per 1,000 SF GFA for a typical weekday (7 sites); and
4. The *average weekend peak hour parking demand* for self-storage units per 1,000 SF GFA for a typical Saturday (3 sites).

The information and calculations are summarized below for the average condition and assuming 335 storage units at 22,500 SF GFA:

- The *average parking supply ratio* was 0.2 spaces per 1,000 SF GFA, which would equate to about 5 spaces ($0.2 \times 22.5 = 4.5$);
- The *average weekday peak hour parking demand* for 100 storage units would be based on the following calculation:
 - $P = 0.90x + 2$, where P is the number of parked vehicles and x = number of 100 storage units, so for 335 units, $x = 3.35$
 - For 335 units, the number of parked vehicles during the average weekday peak hour would be 6 vehicles, rounded up from 5.015 spaces calculated as $P = (0.90 \times 3.35) + 2$.
- The *average weekday peak hour parking demand* per 1,000 SF GFA would be based on the following calculation:

¹ Institute of Transportation Engineers, Parking Generation Manual, 4th Edition, 2010.

- $P = 0.07x + 4$, where P is the number of parked vehicles and $x = 1,000$ SF GFA, so for 22,500 SF GFA, $x = 22.5$
- For 22,500 SF GFA, the number of parked vehicles during the average weekday peak hour would be 6 vehicles, rounded up from 5.575 vehicles calculated as $P = (0.07 * 22.5) + 4$.
- The *average weekend peak hour parking demand* per 1,000 SF GFA for a Saturday would be based on the following calculation:
 - 0.11 vehicles per 1,000 SF GFA, so the average weekend peak hour parking demand would be 3 vehicles, rounded up from 2.475 vehicles calculated as $P = 0.11 * 22.5$.

Table 1 provides a summary of the data studies summarized and included in the ITE Parking Generation Manual. The peak hour parking demand studies suggest a range of 2 to 6 spaces.

Table 1 - Parking Summary

Condition	Demand
1. Avg. Parking Supply Ratio ²	5 Spaces
2. Avg. Weekday Peak Hour Parking Demand (335 Storage Units)	6 Vehicles
3. Avg. Weekday Peak Hour Parking Demand (22,500 SF GFA)	6 Vehicles
4. Avg. Saturday Peak Hour Parking Demand (22,500 SF GFA)	3 Vehicles

Traffic Generation Characteristics

The ITE Trip Generation Manual³ was consulted to determine the typical traffic generation characteristics for self-storage units. Identical to the Parking Generation Manual, ITE “Land Use Code 151: Mini-Warehouse” was the category that best fit the proposed development type.

Excerpts from the Trip Generation Manual are attached to this memorandum for reference purposes only and are summarized below as it pertains to the proposed development. The Manual provides data on:

1. The *average weekday daily vehicle trip ends* per 1,000 SF GFA (14 studies);
2. The *average weekday vehicle trip ends* per 1,000 SF GFA for peak hour of adjacent street traffic between 7 and 9am. (11 studies);
3. The *average weekday vehicle trip ends* per 1,000 SF GFA for peak hour of adjacent street traffic between 4 and 6pm. (15 studies);
4. The *average weekday vehicle trip ends* per Storage Unit for peak hour of adjacent street traffic between 7 and 9am. (11 studies); and
5. The *average weekday vehicle trip ends* per Storage Unit for peak hour of adjacent street traffic between 4 and 6pm. (10 studies).

The information and calculations are summarized below for the average condition and assuming 335 storage units at 22,500 SF GFA:

- The *average weekday daily trip generation rate* is 2.50 vehicles per 1,000 SF GFA, which would result in 57 daily trips, 50% entering the site and 50% exiting the site;
- The *average weekday morning vehicle trip rate* is 0.14 vehicles per 1,000 SF GFA, which would result in 4 peak hour trips with 55% entering the site and 45% exiting the site;

² Avg. Parking Supply Ratio is the average parking supply, not parking demand for existing sites.

³ Institute of Transportation Engineers, Trip Generation Manual, 9th Edition, Volume 2: Data, 2012.

- The *average weekday afternoon vehicle trip rate* is 0.26 vehicles per 1,000 SF GFA, which would result in 6 peak hour trips with 50% entering the site and 50% exiting the site;
- The *average weekday morning vehicle trip rate* is 0.02 vehicles per Storage Unit, which would result in 7 peak hour trips with 50% entering the site and 50% exiting the site; and
- The *average weekday afternoon vehicle trip rate* is also 0.02 vehicles per Storage Unit, which would result in 7 peak hour trips with 48% entering the site and 52% exiting the site.

Table 2 provides a summary of the trip generation characteristics as applied to the proposed development based on the ITE Trip Generation Manual. Average Weekday Daily Trips in Table 2 represent the average number of vehicle trips generated in a 24 hour weekday period. Items 2-5 list the highest number of trips generated during one hour occurring during either the morning (between 7 and 9am) or afternoon (between 4 and 6pm) peak period.

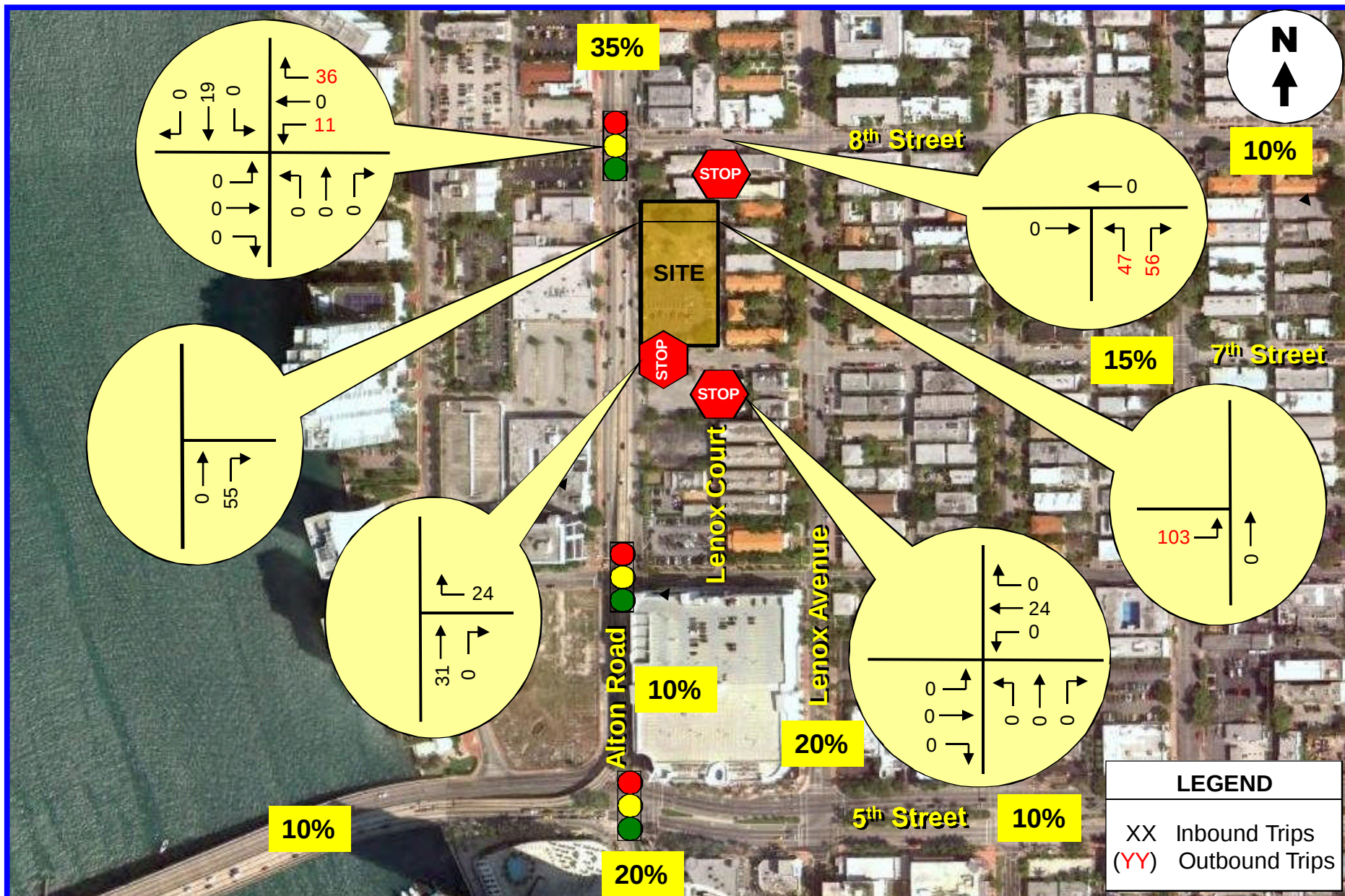
Table 2 – Trip Generation Characteristics Summary⁴

Condition	In	Out	Total
1. Avg. Weekday Daily Trips	29	28	57
2. Avg. Weekday Morning Vehicle Trips (22,500 SF GFA)	2	2	4
3. Avg. Weekday Afternoon Vehicle Trips (22,500 SF GFA)	3	3	6

The weekday daily trips are estimated at 56, the average weekday morning peak hour vehicle trips range from 4 (based on SF GFA) to 7 trips (based on units) and the weekday afternoon peak hour trips range from 6 (based on SF GFA) to 7 (based on units), depending on whether the ITE rate is used for SF GFA or the number of storage units is used.

⁴ Volumes listed items 2-5 represent peak hour trips (one hour) and are rounded to the nearest whole number.

Baptist Health Urgent Care



APPENDIX F:
Trip Generation, Taxi Trip Data, and
Transit Service Information

PEAK HOUR TRIP GENERATION COMPARISON

EXISTING WEEKDAY PM PEAK HOUR TRIP GENERATION

ITE TRIP GENERATION CHARACTERISTICS					DIRECTIONAL DISTRIBUTION		GROSS VOLUMES			MULTIMODAL REDUCTION		EXTERNAL TRIPS			INTERNAL CAPTURE		EXTERNAL TRIPS			PASS-BY CAPTURE		NET NEW EXTERNAL TRIPS				
Land Use		ITE Edition	ITE Code	Scale	ITE Units	Percent		In	Out	Total	Percent	MR Trips	In	Out	Total	Percent	IC Trips	In	Out	Total	Percent	PB Trips	In	Out	Total	
						In	Out																			
GROUP 1	1	Car Dealership ⁽¹⁾	N/A	N/A	5.568	ksf	50%	50%	3	3	6	10%	1	3	2	5	0.0%	0	3	2	5	0.0%	0	3	2	5
	2	Drinking Place	9	925	9.812	ksf	66%	34%	73	38	111	10%	11	66	34	100	0.0%	0	66	34	100	0.0%	0	66	34	100
	3																									
	4																									
	5																									
	6																									
	7																									
	8																									
	9																									
	10																									
	11																									
	12																									
	13																									
	14																									
	15																									
ITE Land Use Code			Rate or Equation			Total:		76	41	117	10.0%	12	69	36	105	0.0%	0	69	36	105	0.0%	0	69	36	105	
925			Y=11.34(X)																							

Note: ⁽¹⁾ Trip generation obtained from driveway volumes counted on 02/18/2016 as per the request of the City of Miami Beach.

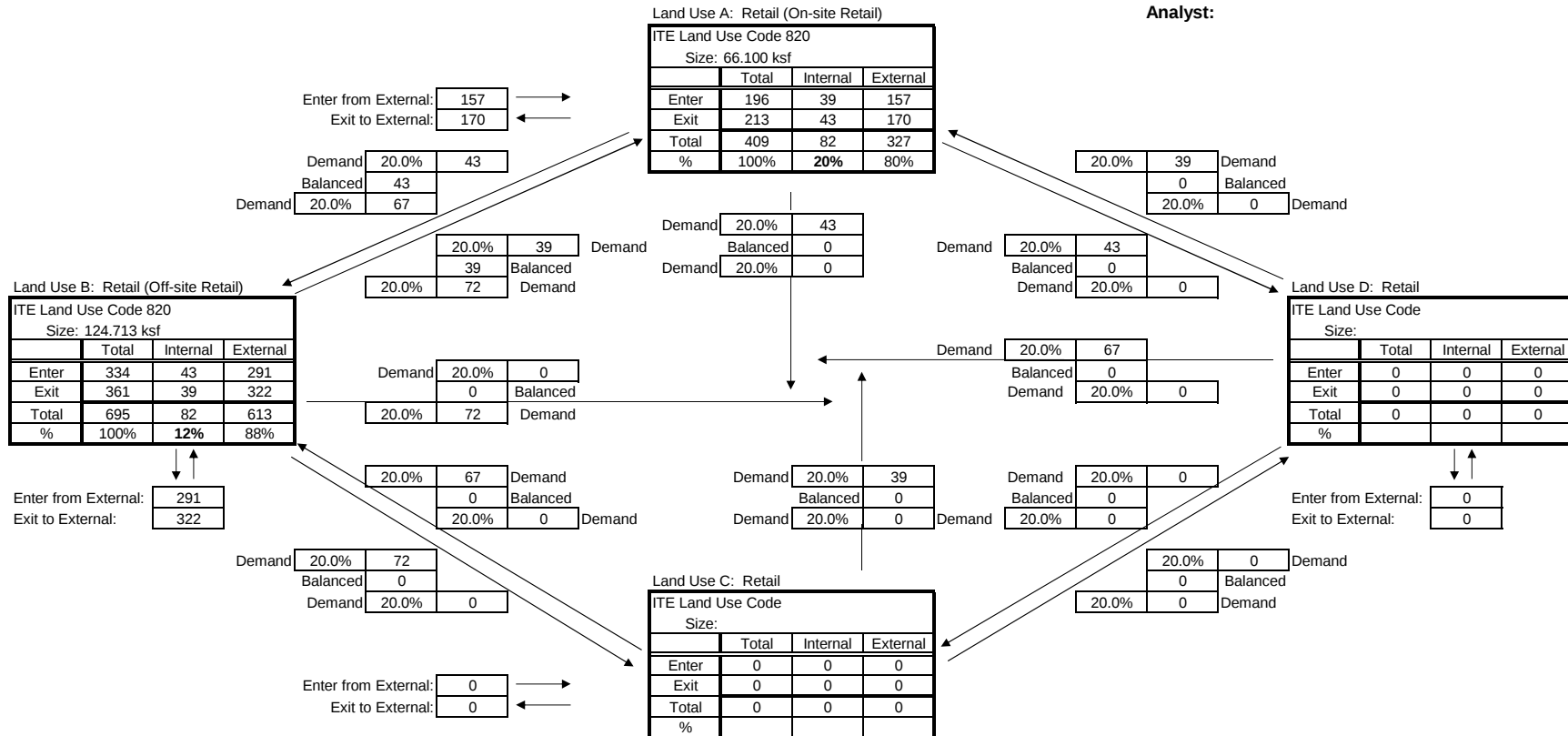
PROPOSED WEEKDAY PM PEAK HOUR TRIP GENERATION

ITE TRIP GENERATION CHARACTERISTICS					DIRECTIONAL DISTRIBUTION		GROSS VOLUMES			MULTIMODAL REDUCTION		EXTERNAL TRIPS			INTERNAL CAPTURE		EXTERNAL TRIPS			PASS-BY CAPTURE		NET NEW EXTERNAL TRIPS							
Land Use	ITE Edition	ITE Code	Scale	ITE Units	Percent		In	Out	Total	Percent	MR Trips	In	Out	Total	Percent	IC Trips	In	Out	Total	Percent	PB Trips	In	Out	Total					
					In	Out																							
1 Shopping Center	9	820	66.1	ksf	48%	52%	218	236	454	10%	45	196	213	409	20.0%	82	157	170	327	34.0%	111	104	112	216					
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													
13																													
14																													
15																													
ITE Land Use Code					Rate or Equation		Total:			218	236	454	10.0%	45	196	213	409	20.0%	82	157	170	327	34.0%	111	104	112	216		
820					LN(Y) = 0.67*LN(X)+3.31																								

	IN	OUT	TOTAL
Net New Vehicle Trips	35	76	111

ITE MULTI-USE PROJECT INTERNAL CAPTURE WORKSHEET
 (Source: Chapter 7, ITE Trip Generation Handbook, June 2004)

Project Number:
Project Name:
Scenario:
Analysis Period: PM Peak
Analyst:



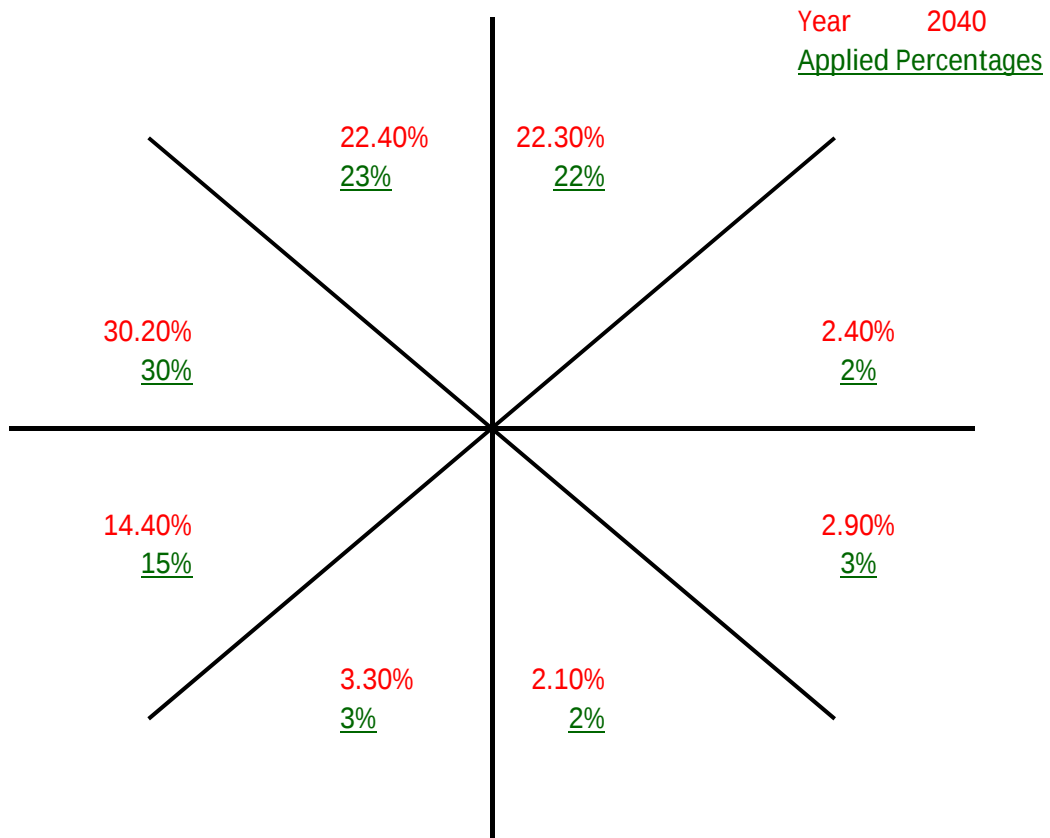
NET EXTERNAL TRIPS FOR MULTI-USE DEVELOPMENT					
Category	Land Use				Total
	A	B	C	D	
Enter	157	291	0	0	448
Exit	170	322	0	0	492
Total	327	613	0	0	940
Single Use Trip Gen Estimate	409	695	0	0	1,104

20.0% 11.8% #DIV/0!
 Overall Internal Capture = 14.86%

APPENDIX G:

Trip Distribution and Assignment

Cardinal Distribution for TAZ 652



Cardinal Trip Distribution

Cardinal Direction	Percentage of Trips 2040	2040 Rounded
North-Northeast	22.30%	22.00%
East-Northeast	2.40%	2.00%
East-Southeast	2.90%	3.00%
South-Southeast	2.10%	2.00%
South-Southwest	3.30%	3.00%
West-Southwest	14.40%	15.00%
West-Northwest	30.20%	30.00%
North-Northwest	22.40%	23.00%
Total	100.0%	100.00%



Miami-Dade 2010 Directional Distribution Summary

Origin TAZ			Cardinal Directions								Total
County TAZ	Regional TAZ		NNE	ENE	ESE	SSE	SSW	WSW	WNW	NNW	
636	3536	PERCENT	10.7	0.0	0.0	4.4	10.0	34.0	20.8	20.1	
637	3537	TRIPS	437	39	52	212	109	449	313	207	1,818
637	3537	PERCENT	24.0	2.2	2.9	11.7	6.0	24.7	17.2	11.4	
638	3538	TRIPS	148	25	57	108	66	231	258	107	1,000
638	3538	PERCENT	14.8	2.5	5.7	10.8	6.6	23.1	25.8	10.7	
639	3539	TRIPS	694	286	232	913	139	1,445	989	693	5,391
639	3539	PERCENT	12.9	5.3	4.3	16.9	2.6	26.8	18.4	12.9	
640	3540	TRIPS	436	242	845	100	107	663	503	303	3,199
640	3540	PERCENT	13.6	7.6	26.4	3.1	3.3	20.7	15.7	9.5	
641	3541	TRIPS	1,374	1,440	228	555	352	2,014	2,014	1,124	9,101
641	3541	PERCENT	15.1	15.8	2.5	6.1	3.9	22.1	22.1	12.4	
642	3542	TRIPS	2,054	891	109	1,000	541	3,435	3,075	2,196	13,301
642	3542	PERCENT	15.4	6.7	0.8	7.5	4.1	25.8	23.1	16.5	
643	3543	TRIPS	1,551	277	0	514	462	2,180	2,043	1,648	8,675
643	3543	PERCENT	17.9	3.2	0.0	5.9	5.3	25.1	23.6	19.0	
644	3544	TRIPS	1,376	0	0	0	1,181	3,638	3,350	2,709	12,254
644	3544	PERCENT	11.2	0.0	0.0	0.0	9.6	29.7	27.3	22.1	
645	3545	TRIPS	547	0	0	0	341	1,032	1,603	1,258	4,781
645	3545	PERCENT	11.4	0.0	0.0	0.0	7.1	21.6	33.5	26.3	
646	3546	TRIPS	862	0	61	243	184	1,226	1,566	1,133	5,275
646	3546	PERCENT	16.3	0.0	1.2	4.6	3.5	23.2	29.7	21.5	
647	3547	TRIPS	454	68	83	148	89	427	406	402	2,077
647	3547	PERCENT	21.9	3.3	4.0	7.1	4.3	20.6	19.6	19.4	
648	3548	TRIPS	1,234	415	131	265	56	788	950	546	4,385
648	3548	PERCENT	28.1	9.5	3.0	6.0	1.3	18.0	21.7	12.5	
649	3549	TRIPS	846	215	84	123	15	631	680	403	2,997
649	3549	PERCENT	28.2	7.2	2.8	4.1	0.5	21.1	22.7	13.5	
650	3550	TRIPS	124	133	83	0	20	325	229	66	980
650	3550	PERCENT	12.7	13.6	8.5	0.0	2.0	33.2	23.4	6.7	
651	3551	TRIPS	612	46	55	0	11	438	656	555	2,373
651	3551	PERCENT	25.8	1.9	2.3	0.0	0.5	18.5	27.6	23.4	
652	3552	TRIPS	743	68	63	25	87	625	873	981	3,465
652	3552	PERCENT	21.4	2.0	1.8	0.7	2.5	18.0	25.2	28.3	
653	3553	TRIPS	708	34	64	143	67	703	835	753	3,307
653	3553	PERCENT	21.4	1.0	1.9	4.3	2.0	21.3	25.3	22.8	
654	3554	TRIPS	490	0	203	74	114	628	1,068	1,058	3,635
654	3554	PERCENT	13.5	0.0	5.6	2.0	3.1	17.3	29.4	29.1	
655	3555	TRIPS	1,475	0	0	0	368	1,892	2,676	2,034	8,445
655	3555	PERCENT	17.5	0.0	0.0	0.0	4.4	22.4	31.7	24.1	
656	3556	TRIPS	372	0	0	0	96	740	997	698	2,903
656	3556	PERCENT	12.8	0.0	0.0	0.0	3.3	25.5	34.3	24.0	



Miami-Dade 2040 Directional Distribution Summary

Origin TAZ			Cardinal Directions								Total
County TAZ	Regional TAZ		NNE	ENE	ESE	SSE	SSW	WSW	WNW	NNW	
636	3536	PERCENT	19.5	0.0	0.0	8.2	14.8	29.5	14.8	13.3	
637	3537	TRIPS	374	82	83	225	55	396	261	151	1,627
637	3537	PERCENT	23.0	5.0	5.1	13.8	3.4	24.3	16.0	9.3	
638	3538	TRIPS	232	28	34	125	70	269	193	126	1,077
638	3538	PERCENT	21.5	2.6	3.2	11.6	6.5	25.0	17.9	11.7	
639	3539	TRIPS	735	283	169	948	113	1,300	821	476	4,845
639	3539	PERCENT	15.2	5.8	3.5	19.6	2.3	26.8	17.0	9.8	
640	3540	TRIPS	430	255	683	151	73	932	515	373	3,412
640	3540	PERCENT	12.6	7.5	20.0	4.4	2.1	27.3	15.1	10.9	
641	3541	TRIPS	1,419	1,154	177	632	303	1,982	1,752	1,049	8,468
641	3541	PERCENT	16.8	13.6	2.1	7.5	3.6	23.4	20.7	12.4	
642	3542	TRIPS	2,179	1,098	137	956	454	3,066	2,615	1,535	12,040
642	3542	PERCENT	18.1	9.1	1.1	7.9	3.8	25.5	21.7	12.8	
643	3543	TRIPS	2,025	464	0	785	437	2,968	1,920	1,574	10,173
643	3543	PERCENT	19.9	4.6	0.0	7.7	4.3	29.2	18.9	15.5	
644	3544	TRIPS	2,373	0	0	0	1,831	4,426	3,267	2,854	14,751
644	3544	PERCENT	16.1	0.0	0.0	0.0	12.4	30.0	22.2	19.4	
645	3545	TRIPS	1,336	0	0	0	789	1,367	1,649	1,160	6,301
645	3545	PERCENT	21.2	0.0	0.0	0.0	12.5	21.7	26.2	18.4	
646	3546	TRIPS	950	0	142	324	255	1,435	1,393	1,140	5,639
646	3546	PERCENT	16.9	0.0	2.5	5.8	4.5	25.5	24.7	20.2	
647	3547	TRIPS	400	97	99	84	58	528	545	323	2,134
647	3547	PERCENT	18.7	4.6	4.6	3.9	2.7	24.7	25.5	15.1	
648	3548	TRIPS	1,129	496	172	440	46	1,080	1,249	650	5,262
648	3548	PERCENT	21.5	9.4	3.3	8.4	0.9	20.5	23.7	12.4	
649	3549	TRIPS	917	197	118	194	38	829	1,043	478	3,814
649	3549	PERCENT	24.0	5.2	3.1	5.1	1.0	21.7	27.4	12.5	
650	3550	TRIPS	88	112	79	9	31	340	412	150	1,221
650	3550	PERCENT	7.2	9.2	6.5	0.7	2.5	27.9	33.7	12.3	
651	3551	TRIPS	833	9	103	0	52	472	1,049	629	3,147
651	3551	PERCENT	26.5	0.3	3.3	0.0	1.7	15.0	33.3	20.0	
652	3552	TRIPS	856	91	112	82	128	551	1,157	859	3,836
652	3552	PERCENT	22.3	2.4	2.9	2.1	3.3	14.4	30.2	22.4	
653	3553	TRIPS	659	74	119	117	68	718	812	627	3,194
653	3553	PERCENT	20.6	2.3	3.7	3.7	2.1	22.5	25.4	19.6	
654	3554	TRIPS	814	0	220	127	186	1,003	1,184	881	4,415
654	3554	PERCENT	18.4	0.0	5.0	2.9	4.2	22.7	26.8	20.0	
655	3555	TRIPS	2,196	0	0	0	807	1,970	3,347	2,212	10,532
655	3555	PERCENT	20.9	0.0	0.0	0.0	7.7	18.7	31.8	21.0	
656	3556	TRIPS	565	0	0	0	108	489	1,022	769	2,953
656	3556	PERCENT	19.1	0.0	0.0	0.0	3.7	16.6	34.6	26.0	

APPENDIX H:

Volume Development Worksheets

TRAFFIC VOLUMES AT STUDY INTERSECTIONS

INTERSECTION: 5th Street and Alton Road
COUNT DATE: February 18, 2016
PM PEAK HOUR FACTOR: 0.94

"PM EXISTING TRAFFIC"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR		
PM Raw Turning Movements				1,171	523		11	1,582	67		579	143	26		62	161	943		
Peak Season Correction Factor		1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100		
PM EXISTING CONDITIONS				1,288	575		12	1,740	74		637	157	29		68	177	1,037		
"PM BACKGROUND TRAFFIC"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR		
600 Alton Road															44	25	15		
Baptist Health Urgent Care - 709 Alton Road												31				11			
Coco Bambu - 955 Alton Road																			
Urban Box Self Storage - 633 Alton Road												1				1			
TOTAL "VESTED" TRAFFIC												32			44	37	15		
Years To Buildout		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
Yearly Growth Rate		0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%		
PM BACKGROUND TRAFFIC GROWTH				14	6		0	19	1		7	2	0		1	2	11		
PM NON-PROJECT TRAFFIC				1,302	581		12	1,759	75		644	191	29		113	216	1,063		
"PROJECT DISTRIBUTION"		LAND USE	TYPE	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Pass-By Distribution	Entering																		
	Exiting																		
Net New Distribution	Entering			10.0%												5.0%			
	Exiting								10.0%										
"PM PROJECT TRAFFIC"		LAND USE	TYPE	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Project Trips	Pass - By																		
	Net New			3						8							2		
PM TOTAL PROJECT TRAFFIC				3						8				0			2	0	
PM TOTAL TRAFFIC				1,305	581		12	1,767	75		644	191	29		115	216	1,063		

TRAFFIC VOLUMES AT STUDY INTERSECTIONS

INTERSECTION: 5th Street and Lenox Avenue
COUNT DATE: February 18, 2016
PM PEAK HOUR FACTOR: 0.94

"PM EXISTING TRAFFIC"	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
PM Raw Turning Movements		159	1,096	15		23	1,496	67		20	39	13		33	37	153
Peak Season Correction Factor	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100

PM EXISTING CONDITIONS		175	1,206	17		25	1,646	74		22	43	14		36	41	168
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"PM BACKGROUND TRAFFIC"	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
600 Alton Road			44													
Baptist Health Urgent Care - 709 Alton Road																
Coco Bambu - 955 Alton Road																
Urban Box Self Storage - 633 Alton Road																
TOTAL "VESTED" TRAFFIC			44													

Years To Buildout	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Yearly Growth Rate	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
PM BACKGROUND TRAFFIC GROWTH		2	13	0		0	18	1		0	0	0		0	0	2

PM NON-PROJECT TRAFFIC		177	1,263	17		25	1,664	75		22	43	14		36	41	170
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"PROJECT DISTRIBUTION"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
LAND USE	TYPE																
Pass-By Distribution	Entering		45.0%	-45.0%				-55.0%	55.0%								
	Exiting																
Net New Distribution	Entering		15.0%						77.0%			8.0%					
	Exiting						8.0%	10.0%									

"PM PROJECT TRAFFIC"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
LAND USE	TYPE																
Project Trips	Pass - By		24	-24				-29	29								
	Net New		5				6	8	27			3					
PM TOTAL PROJECT TRAFFIC			29	-24			6	-21	56			3					

PM TOTAL TRAFFIC		206	1,239	17		31	1,643	131		22	46	14		36	41	170
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TRAFFIC VOLUMES AT STUDY INTERSECTIONS

INTERSECTION: 5th Street and Michigan Avenue
COUNT DATE: February 18, 2016
PM PEAK HOUR FACTOR: 0.96

"PM EXISTING TRAFFIC"	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
PM Raw Turning Movements		73	1,049	18		9	1,457	16		49	51	8		9	21	106
Peak Season Correction Factor	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100

PM EXISTING CONDITIONS	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
		80	1,154	20		10	1,603	18		54	56	9		10	23	117

"PM BACKGROUND TRAFFIC"	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
600 Alton Road			44													
Baptist Health Urgent Care - 709 Alton Road																
Coco Bambu - 955 Alton Road																
Urban Box Self Storage - 633 Alton Road																
TOTAL "VESTED" TRAFFIC			44													

Years To Buildout	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Yearly Growth Rate	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
PM BACKGROUND TRAFFIC GROWTH		1	13	0		0	18	0		1	1	0		0	0	1

PM NON-PROJECT TRAFFIC	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
		81	1,211	20		10	1,621	18		55	57	9		10	23	118

"PROJECT DISTRIBUTION"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
LAND USE	TYPE																
Pass-By Distribution	Entering																
	Exiting														45.0%		55.0%
Net New Distribution	Entering							10.0%			2.0%						65.0%
	Exiting														10.0%	2.0%	18.0%

"PM PROJECT TRAFFIC"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
LAND USE	TYPE																
Project Trips	Pass - By														26		32
	Net New							4			1				8	2	36
PM TOTAL PROJECT TRAFFIC								4			1				34	2	68

PM TOTAL TRAFFIC	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
		81	1,211	20		10	1,625	18		56	57	9		44	25	186

TRAFFIC VOLUMES AT STUDY INTERSECTIONS

INTERSECTION: 6th Street and Alton Road
COUNT DATE: February 18, 2016
PM PEAK HOUR FACTOR: 0.97

"PM EXISTING TRAFFIC"	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
PM Raw Turning Movements								62		0	190	34		49	1,172	
Peak Season Correction Factor	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100

PM EXISTING CONDITIONS	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
								68		0	209	37		54	1,289	

"PM BACKGROUND TRAFFIC"	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
600 Alton Road																
Baptist Health Urgent Care - 709 Alton Road											31				11	
Coco Bambu - 955 Alton Road											79				80	
Urban Box Self Storage - 633 Alton Road											2				2	
TOTAL "VESTED" TRAFFIC											112				93	

Years To Buildout	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Yearly Growth Rate	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
PM BACKGROUND TRAFFIC GROWTH								1		0	2	0		1	14	

PM NON-PROJECT TRAFFIC	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
								69		0	323	37		55	1,396	

"PROJECT DISTRIBUTION"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
LAND USE	TYPE																
Pass-By Distribution	Entering																
	Exiting																
Net New Distribution	Entering													38.0%	5.0%		
	Exiting								43.0%								

"PM PROJECT TRAFFIC"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
LAND USE	TYPE																
Project Trips	Pass - By																
	Net New								32						12	2	
PM TOTAL PROJECT TRAFFIC									32			0			12	2	

PM TOTAL TRAFFIC	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
								101		0	323	37		67	1,398	

TRAFFIC VOLUMES AT STUDY INTERSECTIONS

INTERSECTION: 6th Street and Lenox Avenue
COUNT DATE: February 18, 2016
PM PEAK HOUR FACTOR: 0.93

"PM EXISTING TRAFFIC"	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
PM Raw Turning Movements		5	31	50		52	30	8		39	155	65		23	119	16
Peak Season Correction Factor	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100

PM EXISTING CONDITIONS	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
		6	34	55		57	33	9		43	171	72		25	131	18

"PM BACKGROUND TRAFFIC"	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
600 Alton Road																
Baptist Health Urgent Care - 709 Alton Road																
Coco Bambu - 955 Alton Road																
Urban Box Self Storage - 633 Alton Road																
TOTAL "VESTED" TRAFFIC																

Years To Buildout	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Yearly Growth Rate	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
PM BACKGROUND TRAFFIC GROWTH		0	0	1		1	0	0		0	2	1		0	1	0

PM NON-PROJECT TRAFFIC	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
		6	34	56		58	33	9		43	173	73		25	132	18

"PROJECT DISTRIBUTION"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
LAND USE	TYPE																
Pass-By Distribution	Entering																
	Exiting												100.0%				
Net New Distribution	Entering			38.0%											10.0%		
	Exiting										43.0%	10.0%	47.0%				

"PM PROJECT TRAFFIC"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
LAND USE	TYPE																
Project Trips	Pass - By												58				
	Net New			12							32	8	36		4		
PM TOTAL PROJECT TRAFFIC				12							32	8	94		4		

PM TOTAL TRAFFIC	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
		6	46	56		58	33	9		75	181	167		29	132	18

TRAFFIC VOLUMES AT STUDY INTERSECTIONS

INTERSECTION: 6th Street and Michigan Avenue
COUNT DATE: February 18, 2016
PM PEAK HOUR FACTOR: 0.88

"PM EXISTING TRAFFIC"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
PM Raw Turning Movements			12	76	25		35	67	6		13	110	24		8	79	11
Peak Season Correction Factor		1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100
PM EXISTING CONDITIONS			13	84	28		39	74	7		14	121	26		9	87	12
"PM BACKGROUND TRAFFIC"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
600 Alton Road																	
Baptist Health Urgent Care - 709 Alton Road																	
Coco Bambu - 955 Alton Road																	
Urban Box Self Storage - 633 Alton Road																	
TOTAL "VESTED" TRAFFIC																	
Years To Buildout		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Yearly Growth Rate		0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
PM BACKGROUND TRAFFIC GROWTH			0	1	0		0	1	0		0	1	0		0	1	0
PM NON-PROJECT TRAFFIC			13	85	28		39	75	7		14	122	26		9	88	12
"PROJECT DISTRUBUTION"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
LAND USE	TYPE																
Pass-By Distribution	Entering																
	Exiting				100.0%												
Net New Distribution	Entering				48.0%		10.0%									7.0%	
	Exiting		7.0%	10.0%	30.0%												
"PM PROJECT TRAFFIC"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Project Trips	Pass - By				58												
	Net New		4	8	40		4									2	
PM TOTAL PROJECT TRAFFIC			4	8	98		4									2	
PM TOTAL TRAFFIC			17	93	126		43	75	7		14	122	26		9	90	12

TRAFFIC VOLUMES AT STUDY INTERSECTIONS

INTERSECTION: Garage Access and Lenox Avenue
COUNT DATE: February 18, 2016
PM PEAK HOUR FACTOR: 1

"PM EXISTING TRAFFIC"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
PM Raw Turning Movements												262				222	
Peak Season Correction Factor		1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100
PM EXISTING CONDITIONS												288				244	
"PM BACKGROUND TRAFFIC"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
600 Alton Road																	
Baptist Health Urgent Care - 709 Alton Road																	
Coco Bambu - 955 Alton Road																	
Urban Box Self Storage - 633 Alton Road																	
TOTAL "VESTED" TRAFFIC																	
Years To Buildout		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Yearly Growth Rate		0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
PM BACKGROUND TRAFFIC GROWTH												3				3	
PM NON-PROJECT TRAFFIC												291				247	
"PROJECT DISTRUBUTION"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
LAND USE	TYPE																
Pass-By Distribution	Entering												100.0%				
	Exiting								100.0%								
Net New Distribution	Entering												100.0%				
	Exiting								100.0%								
"PM PROJECT TRAFFIC"		EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
LAND USE	TYPE																
Project Trips	Pass - By								58				53				
	Net New								112				104				
PM TOTAL PROJECT TRAFFIC									170				157				
PM TOTAL TRAFFIC									170			291	157			247	

APPENDIX I: Intersection Capacity Analyses

Existing Conditions

Timings

1: Alton Road & 5th Street

Existing Conditions

Weekday Peak Hour

									
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	1288	575	12	1740	74	637	157	177	1037
Future Volume (vph)	1288	575	12	1740	74	637	157	177	1037
Turn Type	NA	Free	Prot	NA	Perm	Split	NA	NA	Free
Protected Phases	2		1	6		3	3	4	
Permitted Phases		Free			6				Free
Detector Phase	2		1	6	6	3	3	4	
Switch Phase									
Minimum Initial (s)	5.0		5.0	5.0	5.0	7.0	7.0	7.0	
Minimum Split (s)	33.0		10.7	33.0	33.0	22.5	22.5	29.0	
Total Split (s)	92.0		11.0	103.0	103.0	33.0	33.0	44.0	
Total Split (%)	51.1%		6.1%	57.2%	57.2%	18.3%	18.3%	24.4%	
Yellow Time (s)	4.0		3.4	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0		2.3	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.7	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag		Lead			Lead	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes			Yes	Yes	Yes	
Recall Mode	C-Min		Min	C-Min	C-Min	None	None	None	

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 114 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Alton Road & 5th Street

			
11 s	92 s	33 s	44 s
			
103 s			

Queues

1: Alton Road & 5th Street

Existing Conditions

Weekday Peak Hour

									
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	1370	612	13	1851	79	678	198	260	1103
v/c Ratio	0.78	0.40	0.24	0.93	0.09	1.18	0.67	0.83	0.71
Control Delay	41.0	0.8	114.4	36.6	1.9	156.0	81.8	93.4	2.7
Queue Delay	0.0	0.0	0.0	6.0	0.0	0.0	0.0	1.3	0.0
Total Delay	41.0	0.8	114.4	42.6	1.9	156.0	81.8	94.7	2.7
Queue Length 50th (ft)	667	0	14	1182	18	~529	223	301	0
Queue Length 95th (ft)	816	0	m25	#1310	1	#662	#337	395	0
Internal Link Dist (ft)	430			320			383	384	
Turn Bay Length (ft)		250	140			250			
Base Capacity (vph)	1766	1539	55	1988	898	577	297	387	1562
Starvation Cap Reductn	0	0	0	118	0	0	0	33	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.40	0.24	0.99	0.09	1.18	0.67	0.73	0.71

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

1: Alton Road & 5th Street

Existing Conditions

Weekday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1288	575	12	1740	74	637	157	29	68	177	1037
Future Volume (vph)	0	1288	575	12	1740	74	637	157	29	68	177	1037
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	5.7	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.97	1.00	1.00	0.98	1.00	0.96			1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (prot)		3539	1539	1770	3539	1556	3433	1746			1837	1562
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (perm)		3539	1539	1770	3539	1556	3433	1746			1837	1562
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1370	612	13	1851	79	678	167	31	72	188	1103
RTOR Reduction (vph)	0	0	0	0	0	24	0	3	0	0	0	0
Lane Group Flow (vph)	0	1370	612	13	1851	55	678	195	0	0	260	1103
Confl. Peds. (#/hr)			46	46					67	67		
Confl. Bikes (#/hr)			11			13			8			7
Turn Type		NA	Free	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases			Free			6						Free
Actuated Green, G (s)		89.8	180.0	5.5	101.0	101.0	30.3	30.3			30.7	180.0
Effective Green, g (s)		89.8	180.0	5.5	101.0	101.0	30.3	30.3			30.7	180.0
Actuated g/C Ratio		0.50	1.00	0.03	0.56	0.56	0.17	0.17			0.17	1.00
Clearance Time (s)		6.0		5.7	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0		2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1765	1539	54	1985	873	577	293			313	1562
v/s Ratio Prot		0.39		0.01	c0.52		c0.20	0.11			0.14	
v/s Ratio Perm			0.40			0.04						c0.71
v/c Ratio		0.78	0.40	0.24	0.93	0.06	1.18	0.66			0.83	0.71
Uniform Delay, d1		36.9	0.0	85.2	36.4	18.0	74.8	70.1			72.1	0.0
Progression Factor		1.00	1.00	1.24	0.77	0.26	1.00	1.00			1.00	1.00
Incremental Delay, d2		3.4	0.8	0.7	8.2	0.1	96.0	5.6			17.2	2.7
Delay (s)		40.3	0.8	106.2	36.3	4.7	170.8	75.7			89.4	2.7
Level of Service		D	A	F	D	A	F	E			F	A
Approach Delay (s)		28.1			35.5			149.3			19.2	
Approach LOS		C			D			F			B	
Intersection Summary												
HCM 2000 Control Delay			45.7									
HCM 2000 Volume to Capacity ratio			1.00									
Actuated Cycle Length (s)			180.0									
Intersection Capacity Utilization			94.3%									
Analysis Period (min)			15									
c Critical Lane Group												

Timings 2: Lenox Avenue & 5th Street

Existing Conditions

Weekday Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations		  		  		 		 	
Traffic Volume (vph)	175	1206	25	1646	22	43	36	41	168
Future Volume (vph)	175	1206	25	1646	22	43	36	41	168
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	1	6		2		4		8	
Permitted Phases	6		2		4		8		8
Detector Phase	1	6	2	2	4	4	8	8	8
Switch Phase									
Minimum Initial (s)	5.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.0	23.0	23.0	23.0	38.5	38.5	38.5	38.5	38.5
Total Split (s)	23.0	141.0	118.0	118.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	12.8%	78.3%	65.6%	65.6%	21.7%	21.7%	21.7%	21.7%	21.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0		6.5		6.5	6.5
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 137 (76%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 2: Lenox Avenue & 5th Street

		
ø1	ø2 (R)	ø4
23 s	118 s	39 s
		
ø6 (R)		ø8
141 s		39 s

Queues
2: Lenox Avenue & 5th Street

Existing Conditions
Weekday Peak Hour

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	186	1301	27	1830	84	82	179
v/c Ratio	0.68	0.34	0.12	0.58	0.30	0.32	0.48
Control Delay	35.9	7.7	6.9	12.8	63.8	68.3	12.5
Queue Delay	3.0	8.4	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	16.0	6.9	12.8	63.8	68.3	12.5
Queue Length 50th (ft)	88	171	3	516	82	86	2
Queue Length 95th (ft)	176	190	m15	621	141	145	79
Internal Link Dist (ft)		179		320	250	419	
Turn Bay Length (ft)	225		125				
Base Capacity (vph)	303	3810	232	3198	281	264	379
Starvation Cap Reductn	51	2472	0	178	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.97	0.12	0.61	0.30	0.31	0.47

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 2010 Signalized Intersection Summary

2: Lenox Avenue & 5th Street

Existing Conditions

Weekday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	1206	17	25	1646	74	22	43	14	36	41	168
Future Volume (veh/h)	175	1206	17	25	1646	74	22	43	14	36	41	168
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	0.99		0.94	0.90		0.82	0.88		0.82
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	186	1283	18	27	1751	79	23	46	15	38	44	179
Adj No. of Lanes	1	3	0	1	3	0	0	1	0	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	278	3885	55	329	3451	155	73	136	40	130	140	231
Arrive On Green	0.06	1.00	1.00	0.92	0.92	0.92	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1774	5159	72	417	4973	224	265	764	224	566	790	1299
Grp Volume(v), veh/h	186	843	458	27	1193	637	84	0	0	82	0	179
Grp Sat Flow(s),veh/h/ln	1774	1695	1841	417	1695	1807	1253	0	0	1356	0	1299
Q Serve(g_s), s	5.5	0.0	0.0	1.0	9.2	9.2	3.1	0.0	0.0	0.0	0.0	23.7
Cycle Q Clear(g_c), s	5.5	0.0	0.0	1.0	9.2	9.2	13.6	0.0	0.0	10.5	0.0	23.7
Prop In Lane	1.00		0.04	1.00		0.12	0.27		0.18	0.46		1.00
Lane Grp Cap(c), veh/h	278	2553	1387	329	2352	1254	248	0	0	270	0	231
V/C Ratio(X)	0.67	0.33	0.33	0.08	0.51	0.51	0.34	0.00	0.00	0.30	0.00	0.78
Avail Cap(c_a), veh/h	400	2553	1387	329	2352	1254	252	0	0	274	0	235
HCM Platoon Ratio	1.33	1.33	1.33	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.54	0.54	0.54	0.86	0.86	0.86	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.6	0.0	0.0	2.2	2.5	2.5	65.5	0.0	0.0	64.7	0.0	70.6
Incr Delay (d2), s/veh	0.6	0.2	0.3	0.4	0.7	1.3	0.6	0.0	0.0	0.5	0.0	14.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.1	0.1	0.2	4.2	4.7	3.8	0.0	0.0	3.6	0.0	9.4
LnGrp Delay(d),s/veh	8.1	0.2	0.3	2.6	3.2	3.8	66.1	0.0	0.0	65.1	0.0	84.9
LnGrp LOS	A	A	A	A	A	A	E			E		F
Approach Vol, veh/h		1487			1857			84			261	
Approach Delay, s/veh		1.2			3.4			66.1			78.7	
Approach LOS		A			A			E			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.6	130.9		38.5		141.5		38.5				
Change Period (Y+Rc), s	3.0	6.0		6.5		6.0		6.5				
Max Green Setting (Gmax), s	20.0	112.0		32.5		135.0		32.5				
Max Q Clear Time (g_c+I1), s	7.5	11.2		15.6		2.0		25.7				
Green Ext Time (p_c), s	0.2	14.0		1.3		14.0		0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			9.3									
HCM 2010 LOS			A									

Timings 3: Michigan Avenue & 5th Street

Existing Conditions

Weekday Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	80	1154	10	1603	54	56	10	23	117
Future Volume (vph)	80	1154	10	1603	54	56	10	23	117
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA	pm+ov
Protected Phases	1	6	5	2		4		8	1
Permitted Phases					4		8		8
Detector Phase	1	6	5	2	4	4	8	8	1
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0	5.0
Minimum Split (s)	10.7	23.0	11.2	23.0	40.5	40.5	40.5	40.5	10.7
Total Split (s)	18.0	108.0	12.0	102.0	60.0	60.0	60.0	60.0	18.0
Total Split (%)	10.0%	60.0%	6.7%	56.7%	33.3%	33.3%	33.3%	33.3%	10.0%
Yellow Time (s)	3.7	4.0	3.7	4.0	4.0	4.0	4.0	4.0	3.7
All-Red Time (s)	2.0	2.0	2.5	2.0	2.5	2.5	2.5	2.5	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Lost Time (s)	5.7	6.0	6.2	6.0		6.5		6.5	5.7
Lead/Lag	Lead	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180
 Actuated Cycle Length: 180
 Offset: 128 (71%), Referenced to phase 2:WBT and 6:EBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated

Splits and Phases: 3: Michigan Avenue & 5th Street

			
ø1	ø2 (R)		ø4
18 s	102 s		60 s
			
ø5	ø6 (R)		ø8
12 s	108 s		60 s

Queues
3: Michigan Avenue & 5th Street

Existing Conditions
Weekday Peak Hour

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	83	1223	10	1689	123	34	122
v/c Ratio	0.64	0.33	0.18	0.51	0.50	0.12	0.33
Control Delay	100.3	10.6	91.2	17.3	73.1	62.0	44.0
Queue Delay	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Total Delay	100.3	10.7	91.2	17.4	73.1	62.0	44.0
Queue Length 50th (ft)	104	119	12	383	128	34	93
Queue Length 95th (ft)	170	186	35	454	203	70	149
Internal Link Dist (ft)		320		296	229	422	
Turn Bay Length (ft)	130		150				100
Base Capacity (vph)	139	3731	60	3337	445	497	384
Starvation Cap Reductn	0	1111	0	0	0	0	0
Spillback Cap Reductn	0	0	0	343	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.47	0.17	0.56	0.28	0.07	0.32
Intersection Summary							

HCM 2010 Signalized Intersection Summary

3: Michigan Avenue & 5th Street

Existing Conditions
Weekday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	1154	20	10	1603	18	54	56	9	10	23	117
Future Volume (veh/h)	80	1154	20	10	1603	18	54	56	9	10	23	117
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.90	1.00		0.89	0.95		0.91	0.95		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	83	1202	21	10	1670	19	56	58	9	10	24	122
Adj No. of Lanes	1	3	0	1	3	0	0	1	0	0	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	100	3553	62	49	3447	39	135	132	19	96	218	344
Arrive On Green	0.08	0.92	0.92	0.04	0.89	0.89	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1774	5135	90	1774	5175	59	600	749	107	399	1238	1441
Grp Volume(v), veh/h	83	793	430	10	1094	595	123	0	0	34	0	122
Grp Sat Flow(s),veh/h/ln	1774	1695	1835	1774	1695	1844	1456	0	0	1636	0	1441
Q Serve(g_s), s	8.3	4.9	4.9	1.0	11.6	11.6	10.8	0.0	0.0	0.0	0.0	12.8
Cycle Q Clear(g_c), s	8.3	4.9	4.9	1.0	11.6	11.6	13.5	0.0	0.0	2.8	0.0	12.8
Prop In Lane	1.00		0.05	1.00		0.03	0.46		0.07	0.29		1.00
Lane Grp Cap(c), veh/h	100	2346	1270	49	2258	1228	286	0	0	314	0	344
V/C Ratio(X)	0.83	0.34	0.34	0.20	0.48	0.48	0.43	0.00	0.00	0.11	0.00	0.36
Avail Cap(c_a), veh/h	121	2346	1270	57	2258	1228	460	0	0	512	0	518
HCM Platoon Ratio	1.33	1.33	1.33	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	82.4	2.4	2.4	84.7	4.1	4.1	66.5	0.0	0.0	62.2	0.0	57.9
Incr Delay (d2), s/veh	26.0	0.4	0.7	0.7	0.7	1.4	0.8	0.0	0.0	0.1	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	2.2	2.5	0.5	5.5	6.2	5.6	0.0	0.0	1.4	0.0	5.1
LnGrp Delay(d),s/veh	108.4	2.8	3.1	85.5	4.8	5.5	67.2	0.0	0.0	62.3	0.0	58.3
LnGrp LOS	F	A	A	F	A	A	E			E		E
Approach Vol, veh/h		1306			1699			123			156	
Approach Delay, s/veh		9.6			5.5			67.2			59.2	
Approach LOS		A			A			E			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.9	125.9		38.2	11.2	130.6		38.2				
Change Period (Y+Rc), s	* 5.7	6.0		6.5	* 6.2	6.0		6.5				
Max Green Setting (Gmax), s	* 12	96.0		53.5	* 5.8	102.0		53.5				
Max Q Clear Time (g_c+l1), s	10.3	13.6		15.5	3.0	6.9		14.8				
Green Ext Time (p_c), s	0.0	11.2		1.2	0.0	11.2		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			12.0									
HCM 2010 LOS			B									
Notes												

Timings

4: Alton Road & 6th Street

Existing Conditions

Weekday Peak Hour

				
Lane Group	WBR	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	68	209	54	1289
Future Volume (vph)	68	209	54	1289
Turn Type	Prot	NA	Prot	NA
Protected Phases	4	6	3	2
Permitted Phases				
Detector Phase	4	6	3	2
Switch Phase				
Minimum Initial (s)	7.0	7.0	5.0	7.0
Minimum Split (s)	13.0	27.0	40.0	27.0
Total Split (s)	17.0	100.0	43.0	100.0
Total Split (%)	10.6%	62.5%	26.9%	62.5%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Min	None	C-Min

Intersection Summary

Cycle Length: 160
 Actuated Cycle Length: 160
 Offset: 49 (31%), Referenced to phase 2:SBT and 6:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated

Splits and Phases: 4: Alton Road & 6th Street

 ø2 (R)	 ø3	 ø4
100 s	43 s	17 s
 ø6 (R)		
100 s		

Queues

4: Alton Road & 6th Street

Existing Conditions

Weekday Peak Hour

				
Lane Group	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	70	253	56	1329
v/c Ratio	0.10	0.10	0.51	0.47
Control Delay	0.3	3.9	87.7	6.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	0.3	3.9	87.7	6.5
Queue Length 50th (ft)	0	26	58	225
Queue Length 95th (ft)	0	42	106	298
Internal Link Dist (ft)		384		251
Turn Bay Length (ft)			300	
Base Capacity (vph)	742	2647	409	2817
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.09	0.10	0.14	0.47
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

4: Alton Road & 6th Street

Existing Conditions

Weekday Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	68	209	37	54	1289
Future Volume (vph)	0	68	209	37	54	1289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00	0.96		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		0.86	0.98		1.00	1.00
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1611	3323		1770	3539
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1611	3323		1770	3539
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	70	215	38	56	1329
RTOR Reduction (vph)	0	67	5	0	0	0
Lane Group Flow (vph)	0	3	248	0	56	1329
Confl. Peds. (#/hr)	108	16		64	64	
Confl. Bikes (#/hr)		4		12		
Turn Type		Prot	NA		Prot	NA
Protected Phases		4	6		3	2
Permitted Phases						
Actuated Green, G (s)		7.0	126.2		8.8	126.2
Effective Green, g (s)		7.0	126.2		8.8	126.2
Actuated g/C Ratio		0.04	0.79		0.06	0.79
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.0	1.0		2.5	1.0
Lane Grp Cap (vph)		70	2621		97	2791
v/s Ratio Prot		c0.00	0.07		c0.03	c0.38
v/s Ratio Perm						
v/c Ratio		0.04	0.09		0.58	0.48
Uniform Delay, d1		73.3	3.9		73.8	5.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.1		6.7	0.6
Delay (s)		73.4	3.9		80.4	6.3
Level of Service		E	A		F	A
Approach Delay (s)	73.4		3.9			9.3
Approach LOS	E		A			A
Intersection Summary						
HCM 2000 Control Delay			11.1		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.46			
Actuated Cycle Length (s)			160.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			51.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM 2010 AWSC
5: Lenox Avenue & 6th Street

Existing Conditions
Weekday Peak Hour

Intersection

Intersection Delay, s/veh	9.7											
Intersection LOS	A											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	6	34	55	0	57	33	9	0	43	171	72
Future Vol, veh/h	0	6	34	55	0	57	33	9	0	43	171	72
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	37	59	0	61	35	10	0	46	184	77
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	8.8	9.4	10.1
HCM LOS	A	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	0%	6%	58%	14%
Vol Thru, %	80%	0%	36%	33%	75%
Vol Right, %	0%	100%	58%	9%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	214	72	95	99	174
LT Vol	43	0	6	57	25
Through Vol	171	0	34	33	131
RT Vol	0	72	55	9	18
Lane Flow Rate	230	77	102	106	187
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.341	0.097	0.14	0.157	0.255
Departure Headway (Hd)	5.338	4.532	4.926	5.305	4.901
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	670	785	721	671	728
Service Time	3.099	2.293	3	3.379	2.967
HCM Lane V/C Ratio	0.343	0.098	0.141	0.158	0.257
HCM Control Delay	10.9	7.8	8.8	9.4	9.7
HCM Lane LOS	B	A	A	A	A
HCM 95th-tile Q	1.5	0.3	0.5	0.6	1

HCM 2010 AWSC
5: Lenox Avenue & 6th Street

Existing Conditions
Weekday Peak Hour

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	25	131	18
Future Vol, veh/h	0	25	131	18
Peak Hour Factor	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	27	141	19
Number of Lanes	0	0	1	0

Approach

SB

Opposing Approach
Opposing Lanes
Conflicting Approach Left
Conflicting Lanes Left
Conflicting Approach Right
Conflicting Lanes Right
HCM Control Delay
HCM LOS

NB
2
WB
1
EB
1
9.7
A

Lane

HCM 2010 AWSC
6: Michigan Avenue & 6th Street

Existing Conditions
Weekday Peak Hour

Intersection

Intersection Delay, s/veh	9											
Intersection LOS	A											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	13	84	28	0	39	74	7	0	14	121	26
Future Vol, veh/h	0	13	84	28	0	39	74	7	0	14	121	26
Peak Hour Factor	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	15	95	32	0	44	84	8	0	16	138	30
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.9	9	9.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	10%	33%	8%
Vol Thru, %	75%	67%	62%	81%
Vol Right, %	16%	22%	6%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	161	125	120	108
LT Vol	14	13	39	9
Through Vol	121	84	74	87
RT Vol	26	28	7	12
Lane Flow Rate	183	142	136	123
Geometry Grp	1	1	1	1
Degree of Util (X)	0.238	0.186	0.184	0.163
Departure Headway (Hd)	4.677	4.719	4.865	4.779
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	765	757	734	747
Service Time	2.723	2.771	2.918	2.83
HCM Lane V/C Ratio	0.239	0.188	0.185	0.165
HCM Control Delay	9.2	8.9	9	8.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.7	0.7	0.6

HCM 2010 AWSC
6: Michigan Avenue & 6th Street

Existing Conditions
Weekday Peak Hour

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	9	87	12
Future Vol, veh/h	0	9	87	12
Peak Hour Factor	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	10	99	14
Number of Lanes	0	0	1	0

Approach

SB

Opposing Approach
Opposing Lanes
Conflicting Approach Left
Conflicting Lanes Left
Conflicting Approach Right
Conflicting Lanes Right
HCM Control Delay
HCM LOS

NB
1
WB
1
EB
1
8.8
A

Lane

Future Background Conditions

Timings

1: Alton Road & 5th Street

Future Background Conditions

Weekday Peak Hour

									
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	1302	581	12	1759	75	644	191	216	1063
Future Volume (vph)	1302	581	12	1759	75	644	191	216	1063
Turn Type	NA	Free	Prot	NA	Perm	Split	NA	NA	Free
Protected Phases	2		1	6		3	3	4	
Permitted Phases		Free			6				Free
Detector Phase	2		1	6	6	3	3	4	
Switch Phase									
Minimum Initial (s)	5.0		5.0	5.0	5.0	7.0	7.0	7.0	
Minimum Split (s)	33.0		10.7	33.0	33.0	22.5	22.5	29.0	
Total Split (s)	92.0		11.0	103.0	103.0	33.0	33.0	44.0	
Total Split (%)	51.1%		6.1%	57.2%	57.2%	18.3%	18.3%	24.4%	
Yellow Time (s)	4.0		3.4	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0		2.3	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.7	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag		Lead			Lead	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes			Yes	Yes	Yes	
Recall Mode	C-Min		Min	C-Min	C-Min	None	None	None	

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 114 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Splits and Phases: 1: Alton Road & 5th Street

			
11 s	92 s	33 s	44 s
			
103 s			

Queues

Future Background Conditions

1: Alton Road & 5th Street

Weekday Peak Hour

									
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	1385	618	13	1871	80	685	234	350	1131
v/c Ratio	0.83	0.40	0.25	1.00	0.09	1.22	0.80	0.94	0.72
Control Delay	46.6	0.8	114.4	50.8	2.9	171.4	91.5	102.2	3.0
Queue Delay	0.0	0.0	0.0	16.6	0.0	0.0	0.0	48.4	0.0
Total Delay	46.6	0.8	114.4	67.4	2.9	171.4	91.5	150.6	3.0
Queue Length 50th (ft)	732	0	14	1216	24	~538	271	409	0
Queue Length 95th (ft)	831	0	m24	#1325	1	#671	#432	#601	0
Internal Link Dist (ft)	430			320			383	384	
Turn Bay Length (ft)		250	140			250			
Base Capacity (vph)	1691	1539	52	1907	863	563	293	386	1562
Starvation Cap Reductn	0	0	0	110	0	0	0	68	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.40	0.25	1.04	0.09	1.22	0.80	1.10	0.72

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

1: Alton Road & 5th Street

Future Background Conditions

Weekday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1302	581	12	1759	75	644	191	29	113	216	1063
Future Volume (vph)	0	1302	581	12	1759	75	644	191	29	113	216	1063
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	5.7	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.97	1.00	1.00	0.98	1.00	0.97			1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)		3539	1539	1770	3539	1556	3433	1764			1831	1562
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (perm)		3539	1539	1770	3539	1556	3433	1764			1831	1562
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1385	618	13	1871	80	685	203	31	120	230	1131
RTOR Reduction (vph)	0	0	0	0	0	26	0	3	0	0	0	0
Lane Group Flow (vph)	0	1385	618	13	1871	54	685	231	0	0	350	1131
Confl. Peds. (#/hr)			46	46					67	67		
Confl. Bikes (#/hr)			11			13			8			7
Turn Type		NA	Free	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases			Free			6						Free
Actuated Green, G (s)		84.8	180.0	5.2	95.7	95.7	29.5	29.5			36.8	180.0
Effective Green, g (s)		84.8	180.0	5.2	95.7	95.7	29.5	29.5			36.8	180.0
Actuated g/C Ratio		0.47	1.00	0.03	0.53	0.53	0.16	0.16			0.20	1.00
Clearance Time (s)		6.0		5.7	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0		2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1667	1539	51	1881	827	562	289			374	1562
v/s Ratio Prot		0.39		0.01	c0.53		c0.20	0.13			c0.19	
v/s Ratio Perm			0.40			0.03						0.72
v/c Ratio		0.83	0.40	0.25	0.99	0.07	1.22	0.80			0.94	0.72
Uniform Delay, d1		41.4	0.0	85.5	41.9	20.5	75.2	72.4			70.4	0.0
Progression Factor		1.00	1.00	1.22	0.79	0.36	1.00	1.00			1.00	1.00
Incremental Delay, d2		5.0	0.8	0.8	17.7	0.1	113.9	14.2			30.7	3.0
Delay (s)		46.3	0.8	104.8	50.9	7.5	189.2	86.6			101.1	3.0
Level of Service		D	A	F	D	A	F	F			F	A
Approach Delay (s)		32.3			49.5			163.0			26.2	
Approach LOS		C			D			F			C	
Intersection Summary												
HCM 2000 Control Delay			55.0									
HCM 2000 Volume to Capacity ratio			1.06									
Actuated Cycle Length (s)			180.0									
Intersection Capacity Utilization			99.6%									
Analysis Period (min)			15									
c Critical Lane Group												

Timings

2: Lenox Avenue & 5th Street

Future Background Conditions

Weekday Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	177	1263	25	1664	22	43	36	41	170
Future Volume (vph)	177	1263	25	1664	22	43	36	41	170
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	1	6		2		4		8	
Permitted Phases	6		2		4		8		8
Detector Phase	1	6	2	2	4	4	8	8	8
Switch Phase									
Minimum Initial (s)	5.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.0	23.0	23.0	23.0	38.5	38.5	38.5	38.5	38.5
Total Split (s)	23.0	140.0	117.0	117.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	12.8%	77.8%	65.0%	65.0%	22.2%	22.2%	22.2%	22.2%	22.2%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0		6.5		6.5	6.5
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 137 (76%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 2: Lenox Avenue & 5th Street

			
ø1	ø2 (R)	ø4	ø8
23 s	117 s	40 s	40 s
			
ø6 (R)			
140 s			

Queues
2: Lenox Avenue & 5th Street

Future Background Conditions
Weekday Peak Hour

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	188	1362	27	1850	84	82	181
v/c Ratio	0.68	0.36	0.12	0.58	0.30	0.32	0.48
Control Delay	56.2	4.3	7.2	13.2	63.8	68.3	13.0
Queue Delay	1.1	0.6	0.0	0.2	0.0	0.0	0.2
Total Delay	57.3	4.9	7.2	13.4	63.8	68.3	13.2
Queue Length 50th (ft)	153	91	3	528	82	86	4
Queue Length 95th (ft)	m186	50	m14	631	141	145	83
Internal Link Dist (ft)		320		320	250	419	
Turn Bay Length (ft)	225		125				
Base Capacity (vph)	301	3811	217	3185	289	272	386
Starvation Cap Reductn	25	1869	0	179	0	0	0
Spillback Cap Reductn	0	0	0	546	0	0	18
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.70	0.12	0.70	0.29	0.30	0.49

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 2010 Signalized Intersection Summary

2: Lenox Avenue & 5th Street

Future Background Conditions

Weekday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	1263	17	25	1664	75	22	43	14	36	41	170
Future Volume (veh/h)	177	1263	17	25	1664	75	22	43	14	36	41	170
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	0.99		0.94	0.90		0.82	0.88		0.82
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	188	1344	18	27	1770	80	23	46	15	38	44	181
Adj No. of Lanes	1	3	0	1	3	0	0	1	0	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	272	3888	52	313	3449	156	72	136	40	130	140	231
Arrive On Green	0.06	0.98	0.98	0.90	0.90	0.90	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1774	5163	69	394	4973	224	265	764	224	566	790	1299
Grp Volume(v), veh/h	188	882	480	27	1206	644	84	0	0	82	0	181
Grp Sat Flow(s),veh/h/ln	1774	1695	1842	394	1695	1807	1252	0	0	1356	0	1299
Q Serve(g_s), s	5.5	1.5	1.5	1.3	11.7	11.8	3.1	0.0	0.0	0.0	0.0	24.0
Cycle Q Clear(g_c), s	5.5	1.5	1.5	1.3	11.7	11.8	13.6	0.0	0.0	10.5	0.0	24.0
Prop In Lane	1.00		0.04	1.00		0.12	0.27		0.18	0.46		1.00
Lane Grp Cap(c), veh/h	272	2553	1387	313	2351	1253	248	0	0	270	0	231
V/C Ratio(X)	0.69	0.35	0.35	0.09	0.51	0.51	0.34	0.00	0.00	0.30	0.00	0.78
Avail Cap(c_a), veh/h	393	2553	1387	313	2351	1253	260	0	0	283	0	242
HCM Platoon Ratio	1.30	1.30	1.30	1.30	1.30	1.30	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.45	0.45	0.45	0.86	0.86	0.86	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.4	0.5	0.5	2.8	3.3	3.3	65.5	0.0	0.0	64.7	0.0	70.7
Incr Delay (d2), s/veh	0.5	0.2	0.3	0.5	0.7	1.3	0.6	0.0	0.0	0.5	0.0	14.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.6	0.7	0.2	5.5	6.1	3.8	0.0	0.0	3.6	0.0	9.5
LnGrp Delay(d),s/veh	8.9	0.7	0.8	3.2	4.0	4.6	66.1	0.0	0.0	65.1	0.0	85.0
LnGrp LOS	A	A	A	A	A	A	E			E		F
Approach Vol, veh/h		1550			1877			84			263	
Approach Delay, s/veh		1.7			4.2			66.1			78.8	
Approach LOS		A			A			E			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.7	130.8		38.5		141.5		38.5				
Change Period (Y+Rc), s	3.0	6.0		6.5		6.0		6.5				
Max Green Setting (Gmax), s	20.0	111.0		33.5		134.0		33.5				
Max Q Clear Time (g_c+I1), s	7.5	13.8		15.6		3.5		26.0				
Green Ext Time (p_c), s	0.2	14.8		1.3		14.9		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			9.7									
HCM 2010 LOS			A									

Timings 3: Michigan Avenue & 5th Street

Future Background Conditions

Weekday Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	81	1211	10	1621	55	57	10	23	118
Future Volume (vph)	81	1211	10	1621	55	57	10	23	118
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA	pm+ov
Protected Phases	1	6	5	2		4		8	1
Permitted Phases					4		8		8
Detector Phase	1	6	5	2	4	4	8	8	1
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0	5.0
Minimum Split (s)	10.7	23.0	11.2	23.0	40.5	40.5	40.5	40.5	10.7
Total Split (s)	18.0	108.0	12.0	102.0	60.0	60.0	60.0	60.0	18.0
Total Split (%)	10.0%	60.0%	6.7%	56.7%	33.3%	33.3%	33.3%	33.3%	10.0%
Yellow Time (s)	3.7	4.0	3.7	4.0	4.0	4.0	4.0	4.0	3.7
All-Red Time (s)	2.0	2.0	2.5	2.0	2.5	2.5	2.5	2.5	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Lost Time (s)	5.7	6.0	6.2	6.0		6.5		6.5	5.7
Lead/Lag	Lead	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180
 Actuated Cycle Length: 180
 Offset: 128 (71%), Referenced to phase 2:WBT and 6:EBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated

Splits and Phases: 3: Michigan Avenue & 5th Street

		
ø1	ø2 (R)	ø4
18 s	102 s	60 s
		
ø5	ø6 (R)	ø8
12 s	108 s	60 s

Queues
3: Michigan Avenue & 5th Street

Future Background Conditions
Weekday Peak Hour

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	84	1282	10	1708	125	34	123
v/c Ratio	0.65	0.34	0.18	0.51	0.51	0.12	0.33
Control Delay	99.1	12.7	91.2	17.5	73.4	62.0	44.0
Queue Delay	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Total Delay	99.1	12.8	91.2	17.6	73.4	62.0	44.0
Queue Length 50th (ft)	105	166	12	390	131	34	94
Queue Length 95th (ft)	170	205	35	463	204	70	151
Internal Link Dist (ft)		320		296	229	422	
Turn Bay Length (ft)	130		150				100
Base Capacity (vph)	140	3734	60	3333	445	497	385
Starvation Cap Reductn	0	1025	0	0	0	0	0
Spillback Cap Reductn	0	0	0	348	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.47	0.17	0.57	0.28	0.07	0.32
Intersection Summary							

HCM 2010 Signalized Intersection Summary

3: Michigan Avenue & 5th Street

Future Background Conditions
Weekday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	1211	20	10	1621	18	55	57	9	10	23	118
Future Volume (veh/h)	81	1211	20	10	1621	18	55	57	9	10	23	118
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.90	1.00		0.89	0.95		0.91	0.95		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	84	1261	21	10	1689	19	57	59	9	10	24	123
Adj No. of Lanes	1	3	0	1	3	0	0	1	0	0	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	101	3556	59	49	3444	39	135	132	19	96	218	345
Arrive On Green	0.08	0.92	0.92	0.04	0.88	0.88	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1774	5141	86	1774	5176	58	601	749	105	398	1235	1441
Grp Volume(v), veh/h	84	832	450	10	1106	602	125	0	0	34	0	123
Grp Sat Flow(s),veh/h/ln	1774	1695	1836	1774	1695	1844	1455	0	0	1633	0	1441
Q Serve(g_s), s	8.4	5.2	5.2	1.0	11.9	12.0	11.0	0.0	0.0	0.0	0.0	12.9
Cycle Q Clear(g_c), s	8.4	5.2	5.2	1.0	11.9	12.0	13.8	0.0	0.0	2.8	0.0	12.9
Prop In Lane	1.00		0.05	1.00		0.03	0.46		0.07	0.29		1.00
Lane Grp Cap(c), veh/h	101	2345	1270	49	2255	1227	286	0	0	314	0	345
V/C Ratio(X)	0.83	0.35	0.35	0.20	0.49	0.49	0.44	0.00	0.00	0.11	0.00	0.36
Avail Cap(c_a), veh/h	121	2345	1270	57	2255	1227	460	0	0	511	0	519
HCM Platoon Ratio	1.33	1.33	1.33	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.94	0.94	0.94	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	82.3	2.4	2.4	84.7	4.2	4.2	66.6	0.0	0.0	62.2	0.0	57.8
Incr Delay (d2), s/veh	26.5	0.4	0.7	0.7	0.8	1.4	0.8	0.0	0.0	0.1	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	2.5	2.8	0.5	5.6	6.3	5.7	0.0	0.0	1.4	0.0	5.2
LnGrp Delay(d),s/veh	108.8	2.8	3.2	85.5	4.9	5.6	67.3	0.0	0.0	62.3	0.0	58.3
LnGrp LOS	F	A	A	F	A	A	E			E		E
Approach Vol, veh/h		1366			1718			125			157	
Approach Delay, s/veh		9.5			5.6			67.3			59.1	
Approach LOS		A			A			E			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.0	125.8		38.3	11.2	130.5		38.3				
Change Period (Y+Rc), s	* 5.7	6.0		6.5	* 6.2	6.0		6.5				
Max Green Setting (Gmax), s	* 12	96.0		53.5	* 5.8	102.0		53.5				
Max Q Clear Time (g_c+l1), s	10.4	14.0		15.8	3.0	7.2		14.9				
Green Ext Time (p_c), s	0.0	11.8		1.2	0.0	11.8		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			12.0									
HCM 2010 LOS			B									
Notes												

Timings

4: Alton Road & 6th Street

Future Background Conditions

Weekday Peak Hour

				
Lane Group	WBR	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	69	323	55	1396
Future Volume (vph)	69	323	55	1396
Turn Type	Prot	NA	Prot	NA
Protected Phases	4	6	3	2
Permitted Phases				
Detector Phase	4	6	3	2
Switch Phase				
Minimum Initial (s)	7.0	7.0	5.0	7.0
Minimum Split (s)	13.0	27.0	40.0	27.0
Total Split (s)	17.0	100.0	43.0	100.0
Total Split (%)	10.6%	62.5%	26.9%	62.5%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Min	None	C-Min

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 49 (31%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 4: Alton Road & 6th Street

 ø2 (R)	 ø3	 ø4
100 s	43 s	17 s
 ø6 (R)		
100 s		

Queues

Future Background Conditions

4: Alton Road & 6th Street

Weekday Peak Hour

				
Lane Group	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	71	371	57	1439
v/c Ratio	0.11	0.14	0.51	0.51
Control Delay	0.4	4.2	87.8	7.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	0.4	4.2	87.8	7.0
Queue Length 50th (ft)	0	42	59	257
Queue Length 95th (ft)	0	64	107	339
Internal Link Dist (ft)		384		251
Turn Bay Length (ft)			300	
Base Capacity (vph)	662	2701	409	2816
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.11	0.14	0.14	0.51
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

Future Background Conditions

4: Alton Road & 6th Street

Weekday Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	69	323	37	55	1396
Future Volume (vph)	0	69	323	37	55	1396
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00	0.97		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		0.86	0.98		1.00	1.00
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1611	3391		1770	3539
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1611	3391		1770	3539
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	71	333	38	57	1439
RTOR Reduction (vph)	0	68	3	0	0	0
Lane Group Flow (vph)	0	3	368	0	57	1439
Confl. Peds. (#/hr)	108	16		64	64	
Confl. Bikes (#/hr)		4		12		
Turn Type		Prot	NA		Prot	NA
Protected Phases		4	6		3	2
Permitted Phases						
Actuated Green, G (s)		7.0	126.1		8.9	126.1
Effective Green, g (s)		7.0	126.1		8.9	126.1
Actuated g/C Ratio		0.04	0.79		0.06	0.79
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.0	1.0		2.5	1.0
Lane Grp Cap (vph)		70	2672		98	2789
v/s Ratio Prot		c0.00	0.11		c0.03	c0.41
v/s Ratio Perm						
v/c Ratio		0.04	0.14		0.58	0.52
Uniform Delay, d1		73.3	4.0		73.7	6.1
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.1		7.1	0.7
Delay (s)		73.4	4.1		80.8	6.7
Level of Service		E	A		F	A
Approach Delay (s)	73.4		4.1			9.6
Approach LOS	E		A			A
Intersection Summary						
HCM 2000 Control Delay			10.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			160.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			54.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM 2010 AWSC
5: Lenox Avenue & 6th Street

Future Background Conditions

Weekday Peak Hour

Intersection

Intersection Delay, s/veh	9.7											
Intersection LOS	A											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	6	34	56	0	58	33	9	0	43	173	73
Future Vol, veh/h	0	6	34	56	0	58	33	9	0	43	173	73
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	37	60	0	62	35	10	0	46	186	78
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	8.8	9.4	10.1
HCM LOS	A	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	0%	6%	58%	14%
Vol Thru, %	80%	0%	35%	33%	75%
Vol Right, %	0%	100%	58%	9%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	216	73	96	100	175
LT Vol	43	0	6	58	25
Through Vol	173	0	34	33	132
RT Vol	0	73	56	9	18
Lane Flow Rate	232	78	103	108	188
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.345	0.099	0.142	0.159	0.257
Departure Headway (Hd)	5.343	4.537	4.936	5.319	4.909
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	669	783	719	669	726
Service Time	3.108	2.303	3.012	3.395	2.98
HCM Lane V/C Ratio	0.347	0.1	0.143	0.161	0.259
HCM Control Delay	10.9	7.8	8.8	9.4	9.7
HCM Lane LOS	B	A	A	A	A
HCM 95th-tile Q	1.5	0.3	0.5	0.6	1

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	25	132	18
Future Vol, veh/h	0	25	132	18
Peak Hour Factor	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	27	142	19
Number of Lanes	0	0	1	0

Approach

SB

Opposing Approach
Opposing Lanes
Conflicting Approach Left
Conflicting Lanes Left
Conflicting Approach Right
Conflicting Lanes Right
HCM Control Delay
HCM LOS

NB
2
WB
1
EB
1
9.7
A

Lane

HCM 2010 AWSC
6: Michigan Avenue & 6th Street

Future Background Conditions

Weekday Peak Hour

Intersection

Intersection Delay, s/veh	9											
Intersection LOS	A											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	13	85	28	0	39	75	7	0	14	122	26
Future Vol, veh/h	0	13	85	28	0	39	75	7	0	14	122	26
Peak Hour Factor	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	15	97	32	0	44	85	8	0	16	139	30
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.9	9.1	9.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	10%	32%	8%
Vol Thru, %	75%	67%	62%	81%
Vol Right, %	16%	22%	6%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	162	126	121	109
LT Vol	14	13	39	9
Through Vol	122	85	75	88
RT Vol	26	28	7	12
Lane Flow Rate	184	143	138	124
Geometry Grp	1	1	1	1
Degree of Util (X)	0.24	0.188	0.186	0.165
Departure Headway (Hd)	4.684	4.727	4.873	4.787
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	764	755	733	746
Service Time	2.733	2.782	2.928	2.84
HCM Lane V/C Ratio	0.241	0.189	0.188	0.166
HCM Control Delay	9.2	8.9	9.1	8.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.7	0.7	0.6

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	9	88	12
Future Vol, veh/h	0	9	88	12
Peak Hour Factor	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	10	100	14
Number of Lanes	0	0	1	0

Approach

SB

Opposing Approach
Opposing Lanes
Conflicting Approach Left
Conflicting Lanes Left
Conflicting Approach Right
Conflicting Lanes Right
HCM Control Delay
HCM LOS

NB
1
WB
1
EB
1
8.8
A

Lane

Future Total Conditions

Timings

1: Alton Road & 5th Street

Future Total Conditions

Weekday Peak Hour

									
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	1305	581	12	1767	75	644	191	216	1063
Future Volume (vph)	1305	581	12	1767	75	644	191	216	1063
Turn Type	NA	Free	Prot	NA	Perm	Split	NA	NA	Free
Protected Phases	2		1	6		3	3	4	
Permitted Phases		Free			6				Free
Detector Phase	2		1	6	6	3	3	4	
Switch Phase									
Minimum Initial (s)	5.0		5.0	5.0	5.0	7.0	7.0	7.0	
Minimum Split (s)	33.0		10.7	33.0	33.0	22.5	22.5	29.0	
Total Split (s)	92.0		11.0	103.0	103.0	33.0	33.0	44.0	
Total Split (%)	51.1%		6.1%	57.2%	57.2%	18.3%	18.3%	24.4%	
Yellow Time (s)	4.0		3.4	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0		2.3	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.7	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag		Lead			Lead	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes			Yes	Yes	Yes	
Recall Mode	C-Min		Min	C-Min	C-Min	None	None	None	

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 114 (63%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Splits and Phases: 1: Alton Road & 5th Street

			
11 s	92 s	33 s	44 s
			
103 s			

Queues

1: Alton Road & 5th Street

Future Total Conditions

Weekday Peak Hour

									
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	1388	618	13	1880	80	685	234	352	1131
v/c Ratio	0.81	0.40	0.25	0.97	0.09	1.33	0.87	0.94	0.72
Control Delay	44.3	0.8	127.2	40.5	1.4	216.9	103.0	102.8	3.0
Queue Delay	0.0	0.0	0.0	6.5	0.0	0.0	0.0	47.9	0.0
Total Delay	44.3	0.8	127.2	47.0	1.4	216.9	103.0	150.7	3.0
Queue Length 50th (ft)	734	0	14	1228	13	~538	271	412	0
Queue Length 95th (ft)	833	0	m27	#1324	m1	#671	#432	#606	0
Internal Link Dist (ft)	430			320			383	384	
Turn Bay Length (ft)		250	140			250			
Base Capacity (vph)	1714	1539	52	1929	872	514	268	386	1562
Starvation Cap Reductn	0	0	0	63	0	0	0	68	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.40	0.25	1.01	0.09	1.33	0.87	1.11	0.72

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

1: Alton Road & 5th Street

Future Total Conditions

Weekday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1305	581	12	1767	75	644	191	29	115	216	1063
Future Volume (vph)	0	1305	581	12	1767	75	644	191	29	115	216	1063
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	5.7	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.97	1.00	1.00	0.98	1.00	0.97			1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)		3539	1539	1770	3539	1556	3433	1764			1831	1562
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (perm)		3539	1539	1770	3539	1556	3433	1764			1831	1562
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1388	618	13	1880	80	685	203	31	122	230	1131
RTOR Reduction (vph)	0	0	0	0	0	25	0	3	0	0	0	0
Lane Group Flow (vph)	0	1388	618	13	1880	55	685	231	0	0	352	1131
Confl. Peds. (#/hr)			46	46					67	67		
Confl. Bikes (#/hr)			11			13			8			7
Turn Type		NA	Free	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases			Free			6						Free
Actuated Green, G (s)		87.2	180.0	5.2	98.1	98.1	27.0	27.0			36.9	180.0
Effective Green, g (s)		87.2	180.0	5.2	98.1	98.1	27.0	27.0			36.9	180.0
Actuated g/C Ratio		0.48	1.00	0.03	0.54	0.54	0.15	0.15			0.20	1.00
Clearance Time (s)		6.0		5.7	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0		2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1714	1539	51	1928	848	514	264			375	1562
v/s Ratio Prot		0.39		0.01	c0.53		c0.20	0.13			c0.19	
v/s Ratio Perm			0.40			0.04						0.72
v/c Ratio		0.81	0.40	0.25	0.98	0.06	1.33	0.87			0.94	0.72
Uniform Delay, d1		39.4	0.0	85.5	39.8	19.3	76.5	74.8			70.4	0.0
Progression Factor		1.00	1.00	1.38	0.68	0.18	1.00	1.00			1.00	1.00
Incremental Delay, d2		4.3	0.8	0.8	13.5	0.1	162.6	25.7			31.1	3.0
Delay (s)		43.6	0.8	118.9	40.7	3.6	239.1	100.5			101.6	3.0
Level of Service		D	A	F	D	A	F	F			F	A
Approach Delay (s)		30.4			39.7			203.8			26.4	
Approach LOS		C			D			F			C	
Intersection Summary												
HCM 2000 Control Delay			57.3			HCM 2000 Level of Service					E	
HCM 2000 Volume to Capacity ratio			1.06									
Actuated Cycle Length (s)			180.0			Sum of lost time (s)					23.7	
Intersection Capacity Utilization			99.9%			ICU Level of Service					F	
Analysis Period (min)			15									
c Critical Lane Group												

Timings

2: Lenox Avenue & 5th Street

Future Total Conditions

Weekday Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	206	1239	31	1643	22	46	36	41	170
Future Volume (vph)	206	1239	31	1643	22	46	36	41	170
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	1	6		2		4		8	
Permitted Phases	6		2		4		8		8
Detector Phase	1	6	2	2	4	4	8	8	8
Switch Phase									
Minimum Initial (s)	5.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.0	23.0	23.0	23.0	38.5	38.5	38.5	38.5	38.5
Total Split (s)	23.0	141.0	118.0	118.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	12.8%	78.3%	65.6%	65.6%	21.7%	21.7%	21.7%	21.7%	21.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0		6.5		6.5	6.5
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	C-Min	C-Min	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 137 (76%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 2: Lenox Avenue & 5th Street

			
ø1	ø2 (R)		ø4
23 s	118 s		39 s
			
ø6 (R)			ø8
141 s			39 s

Queues
2: Lenox Avenue & 5th Street

Future Total Conditions
Weekday Peak Hour

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	219	1336	33	1887	87	82	181
v/c Ratio	0.74	0.35	0.15	0.62	0.31	0.32	0.48
Control Delay	66.2	3.7	11.3	19.4	64.2	68.4	13.0
Queue Delay	2.4	0.5	0.0	0.2	0.0	0.0	0.1
Total Delay	68.6	4.1	11.3	19.6	64.2	68.4	13.1
Queue Length 50th (ft)	191	73	10	596	85	86	4
Queue Length 95th (ft)	m242	23	m35	697	146	146	83
Internal Link Dist (ft)		320		320	250	222	
Turn Bay Length (ft)	225		125				
Base Capacity (vph)	309	3811	220	3102	283	263	379
Starvation Cap Reductn	29	1817	0	231	0	0	0
Spillback Cap Reductn	0	0	0	391	0	0	13
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.67	0.15	0.70	0.31	0.31	0.49

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 2010 Signalized Intersection Summary

2: Lenox Avenue & 5th Street

Future Total Conditions

Weekday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	1239	17	31	1643	131	22	46	14	36	41	170
Future Volume (veh/h)	206	1239	17	31	1643	131	22	46	14	36	41	170
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	0.99		0.94	0.90		0.82	0.88		0.82
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	219	1318	18	33	1748	139	23	49	15	38	44	181
Adj No. of Lanes	1	3	0	1	3	0	0	1	0	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	277	3887	53	317	3285	260	71	141	39	129	140	231
Arrive On Green	0.07	1.00	1.00	0.91	0.91	0.91	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1774	5162	70	403	4780	379	257	794	219	563	787	1299
Grp Volume(v), veh/h	219	866	470	33	1238	649	87	0	0	82	0	181
Grp Sat Flow(s),veh/h/ln	1774	1695	1842	403	1695	1769	1270	0	0	1350	0	1299
Q Serve(g_s), s	6.6	0.0	0.0	1.4	11.0	11.1	3.1	0.0	0.0	0.0	0.0	24.0
Cycle Q Clear(g_c), s	6.6	0.0	0.0	1.4	11.0	11.1	13.7	0.0	0.0	10.6	0.0	24.0
Prop In Lane	1.00		0.04	1.00		0.21	0.26		0.17	0.46		1.00
Lane Grp Cap(c), veh/h	277	2553	1387	317	2330	1216	251	0	0	269	0	231
V/C Ratio(X)	0.79	0.34	0.34	0.10	0.53	0.53	0.35	0.00	0.00	0.30	0.00	0.78
Avail Cap(c_a), veh/h	387	2553	1387	317	2330	1216	255	0	0	273	0	235
HCM Platoon Ratio	1.33	1.33	1.33	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.48	0.48	0.48	0.85	0.85	0.85	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.1	0.0	0.0	2.5	2.9	2.9	65.5	0.0	0.0	64.7	0.0	70.7
Incr Delay (d2), s/veh	2.3	0.2	0.3	0.6	0.7	1.4	0.6	0.0	0.0	0.5	0.0	15.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	0.1	0.1	0.2	5.1	5.6	3.9	0.0	0.0	3.6	0.0	9.6
LnGrp Delay(d),s/veh	13.4	0.2	0.3	3.0	3.6	4.3	66.1	0.0	0.0	65.2	0.0	85.9
LnGrp LOS	B	A	A	A	A	A	E			E		F
Approach Vol, veh/h		1555			1920			87			263	
Approach Delay, s/veh		2.1			3.9			66.1			79.4	
Approach LOS		A			A			E			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.8	129.7		38.5		141.5		38.5				
Change Period (Y+Rc), s	3.0	6.0		6.5		6.0		6.5				
Max Green Setting (Gmax), s	20.0	112.0		32.5		135.0		32.5				
Max Q Clear Time (g_c+I1), s	8.6	13.1		15.7		2.0		26.0				
Green Ext Time (p_c), s	0.2	15.3		1.3		15.3		0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			9.7									
HCM 2010 LOS			A									

Timings 3: Michigan Avenue & 5th Street

Future Total Conditions

Weekday Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	81	1211	10	1625	56	57	45	25	186
Future Volume (vph)	81	1211	10	1625	56	57	45	25	186
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA	pm+ov
Protected Phases	1	6	5	2		4		8	1
Permitted Phases					4		8		8
Detector Phase	1	6	5	2	4	4	8	8	1
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0	5.0
Minimum Split (s)	10.7	23.0	11.2	23.0	40.5	40.5	40.5	40.5	10.7
Total Split (s)	18.0	108.0	12.0	102.0	60.0	60.0	60.0	60.0	18.0
Total Split (%)	10.0%	60.0%	6.7%	56.7%	33.3%	33.3%	33.3%	33.3%	10.0%
Yellow Time (s)	3.7	4.0	3.7	4.0	4.0	4.0	4.0	4.0	3.7
All-Red Time (s)	2.0	2.0	2.5	2.0	2.5	2.5	2.5	2.5	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Lost Time (s)	5.7	6.0	6.2	6.0		6.5		6.5	5.7
Lead/Lag	Lead	Lag	Lead	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None

Intersection Summary

Cycle Length: 180
 Actuated Cycle Length: 180
 Offset: 128 (71%), Referenced to phase 2:WBT and 6:EBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated

Splits and Phases: 3: Michigan Avenue & 5th Street

		
ø1	ø2 (R)	ø4
18 s	102 s	60 s
		
ø5	ø6 (R)	ø8
12 s	108 s	60 s

Queues
3: Michigan Avenue & 5th Street

Future Total Conditions
Weekday Peak Hour

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	84	1282	10	1712	126	73	194
v/c Ratio	0.66	0.34	0.18	0.51	0.52	0.35	0.52
Control Delay	99.1	12.0	91.2	17.4	74.2	69.7	52.8
Queue Delay	0.0	0.1	0.0	0.2	0.0	0.0	0.0
Total Delay	99.1	12.1	91.2	17.5	74.2	69.7	52.9
Queue Length 50th (ft)	0	159	12	390	132	75	167
Queue Length 95th (ft)	170	192	35	461	208	131	238
Internal Link Dist (ft)		320		296	229	422	
Turn Bay Length (ft)	130		150				100
Base Capacity (vph)	138	3733	60	3339	435	373	383
Starvation Cap Reductn	0	1027	0	0	0	0	0
Spillback Cap Reductn	0	0	0	584	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.47	0.17	0.62	0.29	0.20	0.51
Intersection Summary							

HCM 2010 Signalized Intersection Summary

3: Michigan Avenue & 5th Street

Future Total Conditions
Weekday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	1211	20	10	1625	18	56	57	9	45	25	186
Future Volume (veh/h)	81	1211	20	10	1625	18	56	57	9	45	25	186
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.90	1.00		0.89	0.96		0.92	0.96		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	84	1261	21	10	1693	19	58	59	9	47	26	194
Adj No. of Lanes	1	3	0	1	3	0	0	1	0	0	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	101	3523	59	49	3410	38	111	105	14	167	86	355
Arrive On Green	0.08	0.91	0.91	0.04	0.88	0.88	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1774	5141	86	1774	5176	58	447	575	79	734	469	1445
Grp Volume(v), veh/h	84	832	450	10	1109	603	126	0	0	73	0	194
Grp Sat Flow(s),veh/h/ln	1774	1695	1836	1774	1695	1844	1100	0	0	1203	0	1445
Q Serve(g_s), s	8.4	5.8	5.8	1.0	12.9	12.9	12.2	0.0	0.0	0.0	0.0	21.2
Cycle Q Clear(g_c), s	8.4	5.8	5.8	1.0	12.9	12.9	22.3	0.0	0.0	10.1	0.0	21.2
Prop In Lane	1.00		0.05	1.00		0.03	0.46		0.07	0.64		1.00
Lane Grp Cap(c), veh/h	101	2323	1258	49	2234	1215	231	0	0	253	0	355
V/C Ratio(X)	0.83	0.36	0.36	0.20	0.50	0.50	0.55	0.00	0.00	0.29	0.00	0.55
Avail Cap(c_a), veh/h	121	2323	1258	57	2234	1215	390	0	0	417	0	520
HCM Platoon Ratio	1.33	1.33	1.33	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	82.3	2.8	2.8	84.7	4.6	4.6	71.1	0.0	0.0	63.9	0.0	60.0
Incr Delay (d2), s/veh	26.6	0.4	0.8	0.7	0.8	1.5	1.5	0.0	0.0	0.5	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	2.8	3.1	0.5	6.0	6.8	6.0	0.0	0.0	3.2	0.0	8.6
LnGrp Delay(d),s/veh	108.9	3.2	3.5	85.5	5.4	6.0	72.6	0.0	0.0	64.3	0.0	61.0
LnGrp LOS	F	A	A	F	A	A	E			E		E
Approach Vol, veh/h		1366			1722			126			267	
Approach Delay, s/veh		9.8			6.1			72.6			61.9	
Approach LOS		A			A			E			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.0	124.6		39.4	11.2	129.4		39.4				
Change Period (Y+Rc), s	* 5.7	6.0		6.5	* 6.2	6.0		6.5				
Max Green Setting (Gmax), s	* 12	96.0		53.5	* 5.8	102.0		53.5				
Max Q Clear Time (g_c+l1), s	10.4	14.9		24.3	3.0	7.8		23.2				
Green Ext Time (p_c), s	0.0	11.8		1.6	0.0	11.8		1.6				
Intersection Summary												
HCM 2010 Ctrl Delay			14.2									
HCM 2010 LOS			B									
Notes												

Timings 4: Alton Road & 6th Street

Future Total Conditions
Weekday Peak Hour

				
Lane Group	WBR	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	101	323	67	1398
Future Volume (vph)	101	323	67	1398
Turn Type	Prot	NA	Prot	NA
Protected Phases	4	6	3	2
Permitted Phases				
Detector Phase	4	6	3	2
Switch Phase				
Minimum Initial (s)	7.0	7.0	5.0	7.0
Minimum Split (s)	13.0	27.0	40.0	27.0
Total Split (s)	17.0	100.0	43.0	100.0
Total Split (%)	10.6%	62.5%	26.9%	62.5%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Min	None	C-Min

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 49 (31%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 4: Alton Road & 6th Street

 ø2 (R)	 ø3	 ø4
100 s	43 s	17 s
 ø6 (R)		
100 s		

Queues

4: Alton Road & 6th Street

Future Total Conditions

Weekday Peak Hour

				
Lane Group	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	104	371	69	1441
v/c Ratio	0.16	0.14	0.57	0.53
Control Delay	0.6	4.8	88.7	8.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	0.6	4.8	88.7	8.0
Queue Length 50th (ft)	0	44	71	267
Queue Length 95th (ft)	0	66	125	355
Internal Link Dist (ft)		384		251
Turn Bay Length (ft)			300	
Base Capacity (vph)	662	2629	409	2740
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.16	0.14	0.17	0.53
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

4: Alton Road & 6th Street

Future Total Conditions

Weekday Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	101	323	37	67	1398
Future Volume (vph)	0	101	323	37	67	1398
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00	0.97		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		0.86	0.98		1.00	1.00
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1611	3391		1770	3539
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1611	3391		1770	3539
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	104	333	38	69	1441
RTOR Reduction (vph)	0	99	3	0	0	0
Lane Group Flow (vph)	0	5	368	0	69	1441
Confl. Peds. (#/hr)	108	16		64	64	
Confl. Bikes (#/hr)		4		12		
Turn Type		Prot	NA		Prot	NA
Protected Phases		4	6		3	2
Permitted Phases						
Actuated Green, G (s)		7.0	123.9		11.1	123.9
Effective Green, g (s)		7.0	123.9		11.1	123.9
Actuated g/C Ratio		0.04	0.77		0.07	0.77
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.0	1.0		2.5	1.0
Lane Grp Cap (vph)		70	2625		122	2740
v/s Ratio Prot		c0.00	0.11		c0.04	c0.41
v/s Ratio Perm						
v/c Ratio		0.06	0.14		0.57	0.53
Uniform Delay, d1		73.4	4.6		72.1	6.9
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.1		4.8	0.7
Delay (s)		73.5	4.7		76.9	7.6
Level of Service		E	A		E	A
Approach Delay (s)	73.5		4.7			10.8
Approach LOS	E		A			B
Intersection Summary						
HCM 2000 Control Delay			12.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.51			
Actuated Cycle Length (s)			160.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			54.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM 2010 AWSC
5: Lenox Avenue & 6th Street

Future Total Conditions
Weekday Peak Hour

Intersection

Intersection Delay, s/veh10.4

Intersection LOS B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	6	46	56	0	58	33	9	0	75	181	167	0	29	132	18
Future Vol, veh/h	0	6	46	56	0	58	33	9	0	75	181	167	0	29	132	18
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	49	60	0	62	35	10	0	81	195	180	0	31	142	19
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	9.5	9.9	10.9	10.2
HCM LOS	A	A	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	29%	0%	6%	58%	16%
Vol Thru, %	71%	0%	43%	33%	74%
Vol Right, %	0%	100%	52%	9%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	256	167	108	100	179
LT Vol	75	0	6	58	29
Through Vol	181	0	46	33	132
RT Vol	0	167	56	9	18
Lane Flow Rate	275	180	116	108	192
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.418	0.23	0.173	0.171	0.273
Departure Headway (Hd)	5.463	4.61	5.356	5.725	5.219
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	652	769	674	630	693
Service Time	3.257	2.403	3.36	3.73	3.219
HCM Lane V/C Ratio	0.422	0.234	0.172	0.171	0.277
HCM Control Delay	12.2	8.8	9.5	9.9	10.2
HCM Lane LOS	B	A	A	A	B
HCM 95th-tile Q	2.1	0.9	0.6	0.6	1.1

HCM 2010 AWSC
6: Michigan Avenue & 6th Street

Future Total Conditions
Weekday Peak Hour

Intersection

Intersection Delay, s/veh 9.7

Intersection LOS A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	17	93	123	0	43	75	7	0	14	122	26	0	9	90	12
Future Vol, veh/h	0	17	93	123	0	43	75	7	0	14	122	26	0	9	90	12
Peak Hour Factor	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	19	106	140	0	49	85	8	0	16	139	30	0	10	102	14
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10	9.4	9.8	9.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	7%	34%	8%
Vol Thru, %	75%	40%	60%	81%
Vol Right, %	16%	53%	6%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	162	233	125	111
LT Vol	14	17	43	9
Through Vol	122	93	75	90
RT Vol	26	123	7	12
Lane Flow Rate	184	265	142	126
Geometry Grp	1	1	1	1
Degree of Util (X)	0.255	0.338	0.2	0.178
Departure Headway (Hd)	4.98	4.589	5.064	5.09
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	714	776	702	696
Service Time	3.064	2.66	3.147	3.182
HCM Lane V/C Ratio	0.258	0.341	0.202	0.181
HCM Control Delay	9.8	10	9.4	9.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	1.5	0.7	0.6

HCM 2010 TWSC
7: Lenox Avenue & Garage Access

Future Total Conditions
Weekday Peak Hour

Intersection

Int Delay, s/veh 2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	170	291	157	0	247
Future Vol, veh/h	0	170	291	157	0	247
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	185	316	171	0	268

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	670	243	0	0	487	0
Stage 1	402	-	-	-	-	-
Stage 2	268	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.14	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.22	-
Pot Cap-1 Maneuver	406	758	-	-	1072	-
Stage 1	645	-	-	-	-	-
Stage 2	776	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	406	758	-	-	1072	-
Mov Cap-2 Maneuver	406	-	-	-	-	-
Stage 1	645	-	-	-	-	-
Stage 2	776	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	11.3		0		0
HCM LOS	B				

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 758	1072	-
HCM Lane V/C Ratio	-	- 0.244	-	-
HCM Control Delay (s)	-	- 11.3	0	-
HCM Lane LOS	-	- B	A	-
HCM 95th %tile Q(veh)	-	- 1	0	-

APPENDIX J:

Entry Gate Calculations

Project Driveway (Parking Garage Entry Gate)

Reference: *Parking Structures 3rd Edition: Planning, Design, Construction, Maintenance, and Repair*
(Anthony P. Chrest, Mary S. Smith, Sam Bhuyan, Mohammad Iqbal, and Donald R. Monahan, 2001)

Analysis: P.M. peak hour (157 entering vehicles)

Service Rate (Guest): 400 vph (Push-button service rate) x 2 lane = 800 vph

P.M. Peak Hour Traffic Intensity: 0.20

P.M. Peak Hour Queue: Less than 1 vehicle per service lane behind service position

