Traffic Impact Analysis
Prepared for City of Largo

West Bay Largo Mixed-Use Development

City of Largo, Florida

Prepared by:

Kimley-Horn and Associates, Inc.
Tampa, Florida

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May 2023

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No. 48905

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INTRODUCTION

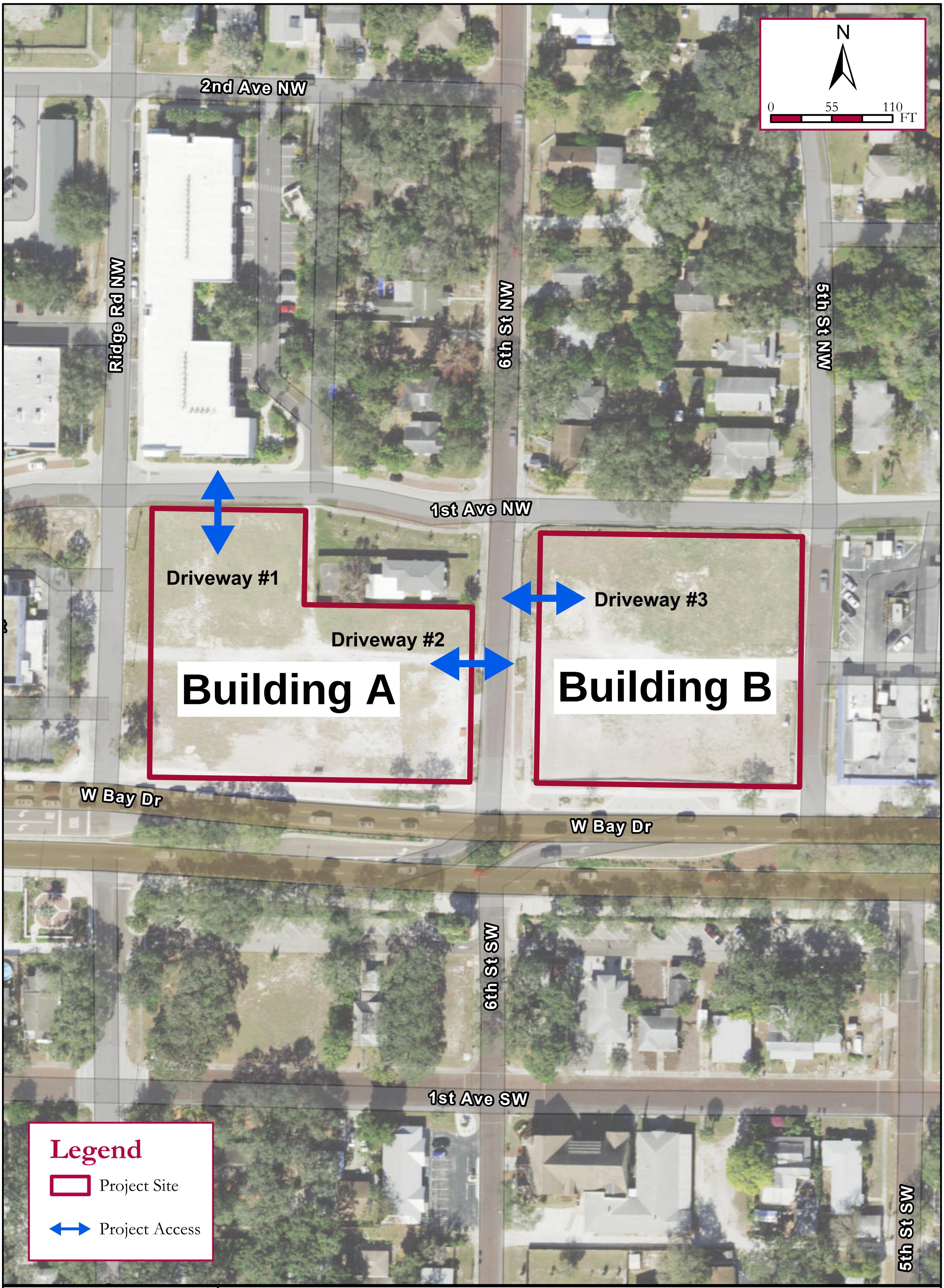
This Traffic Impact Analysis (TIA) is provided for the proposed West Bay Largo Mixed-Use development that is located in the northwest (Building A) and northeast (Building B) quadrants of the intersection of West Bay Drive & 6th Street Northwest in the City of Largo in Pinellas County, Florida. This mixed-use development project site is approximately 2.57 acres and has an anticipated buildout year of 2026. The proposed mixed-use development will consist of up to 276 multi-family housing units (low-rise) and up to 27,300 square feet of retail use. A description of the proposed land uses and the results of the TIA are provided below.

The site is within the West Bay Drive Community Redevelopment District. Therefore, the West Bay Drive Community Redevelopment District Plan was reviewed as part of the transportation analysis of the site. The project location map is illustrated in **Figure 1**.

The Pinellas County MPO approved the Pinellas County Mobility Plan Report in 2013. The intent of the Mobility Plan was to replace local transportation concurrency management programs with a system that provides local governments with the means to manage the traffic impacts of development projects without requiring projects to meet adopted level of service standards. This analysis is provided based upon the requirements in Section 7.2.4 of the City's Development Code for West Bay Drive Community Redevelopment District (WBD-CRD). The requirements include a traffic study and transportation management plan identifying improvements necessary to mitigate the impacts of the project.

As illustrated in **Figure 1**, access to the site is proposed to be provided through the following existing access connections:

- Driveway 1: Full-access connection along 1st Avenue Northwest (Building A)
- Driveway 2: Full-access connection along 6th Street Northwest (Building A)
- Driveway 3: Full-access connection along 6th Street Northwest (Building B)



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Project Location Map

WEST BAY LARGO MIXED-USE DEVELOPMENT
CITY OF LARGO, FLORIDA

Project No: 043797004	Scale: As Noted	May 2023	Figure 1

Prior to undertaking this analysis, a formal Traffic Impact Analysis methodology letter was prepared by Kimley-Horn and submitted to the City of Largo on February 6, 2023. Additionally, a meeting to discuss the methodology was held with City of Largo staff on March 29, 2023. The methodology letter is attached in **Appendix A**. In general, the following procedural steps were undertaken in this Traffic Impact Analysis:

- Traffic volumes anticipated to be generated by the proposed mixed-use development were estimated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition;
- Project traffic was initially distributed and assigned to the public roadway network based upon the results of a Florida Standard Urban Transportation Model Structure (FSUTMS) District Seven Regional Planning Model (D7RPM) analysis. Additionally, existing traffic counts were collected in the area and used to further refine the distribution;
- The study area was agreed upon with City of Largo and was based upon the *2022 Annual Level of Service Report* for Forward Pinellas and consists mainly of the adjacent roadway segments. Additionally, per Forward Pinellas MPO *Traffic Impact Study Methodology*, study area roadway segments are those with the project traffic representing one percent (1.0%) or greater of the available roadway capacity up to a maximum radius of two miles from the project site.
- Existing p.m. peak-hour traffic volumes in the study area were collected and adjusted to reflect the peak season volumes using the Florida Department of Transportation's peak season conversion factor (PSCF), and were used as part of future background volumes;
- Work Programs of the City of Largo, Pinellas County and the FDOT were reviewed to identify scheduled roadway improvements in the area;
- Background (non-project) traffic volumes consist of existing traffic grown by an annual growth rate of one percent (1.0%) and vested/reserved trips associated with previously approved developments in the area (Largo City Hall); and
- Intersection and roadway segment operational analyses within the study area for existing, future background, and future total scenarios were completed using the *Synchro* version 11 software package and the Pinellas County *2022 Annual Level of Service Report* (2021 data).

PROJECT SITE INFORMATION

Project traffic used in this analysis is defined as the vehicle trips expected to be generated by the development. These trips were distributed and assigned throughout the study roadway network.

Project Access

The proposed project access includes the following connections:

- Driveway 1: Full-access connection along 1st Avenue Northwest (Building A)
- Driveway 2: Full-access connection along 6th Street Northwest (Building A)
- Driveway 3: Full-access connection along 6th Street Northwest (Building B)

Trip Generation

The trip generation potential of the proposed mixed-use development was estimated for the p.m. peak-hour using the equations from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 11th Edition, for land use code (LUC) 220 (Multifamily Housing (Low rise)) and LUC 822 (Strip Retail Plaza (<40k)).

Currently the project site is undeveloped, although at total buildout will include up to 276 multi-family dwelling units and up to 27,300 square feet of retail use.

The estimated net, new trips expected to be generated by the proposed mixed-use development are 212 p.m. peak-hour trips (124 entering, 88 exiting), as shown in **Table 1**. Pass-by and internal capture trips were assumed in the analysis based upon the *Trip Generation Handbook*, 3rd Edition. Internal capture calculations are attached in **Appendix B**.

Table 1: P.M. Peak-Hour Project Trip Generation

ITE TRIP GENERATION CHARACTERISTICS					DIRECTIONAL DISTRIBUTION		GROSS TRIPS			INTERNAL CAPTURE		TOTAL EXTERNAL TRIPS			PASS-BY CAPTURE		NET NEW EXTERNAL TRIPS		
Land Use	**ITE Edition**	**ITE Code**	**Scale**	**ITE Units**	**Percent**		**In**	**Out**	**Total**	**Percent**	**IC Trips**	**In**	**Out**	**Total**	**Percent**	**PB Trips**	**In**	**Out**	**Total**
					In	**Out**													
Multifamily Housing Low-Rise	11	220	276	DU	63%	37%	88	51	139	20.9%	29	67	43	110	0%	0	67	43	110
Strip Retail Plaza (<40k)	11	822	27.3	KSF	50%	50%	79	79	158	18.4%	29	71	58	129	17.1%[1]	27[1]	57	45	102
Total:							167	130	297	-	58	138	101	239	-	27	124	88	212

Notes:

1. Pass-By trips assumed for this site do not exceed 10% of the adjacent street traffic (27 Pass-By trips divided by 297 gross trips = 9.1% of adjacent street traffic).

Trip Distribution and Assignment

The trip distribution for the proposed mixed-use development was initially determined using the Florida Standard Urban Transportation Model Structure (FSUTMS) for District 7 (version 9.1) and is shown in **Appendix B**. Existing volume counts at the study intersections were undertaken along West Bay Drive to further refine this distribution.

There are currently road closures along West Bay drive on 4th Street NW, 5th Street NW, 6th Street NW, and Ridge Road N due to the construction of the City Hall. The City Hall is located east of the project site on the adjacent parcel. Due to this, turning movement counts that were previously completed at these study area intersections for the Largo City Hall TIA in 2021 were utilized.

A growth rate, determined by using FDOT's historical Annual Average Daily Traffic (AADT) information for three nearby roadway segments of State Road 686/East Bay Drive (East of US Alt 19), US Alt 19 (South of 4th Avenue Northwest), and Clearwater-Largo Road (North of West Bay Drive), was initially calculated as -2.49%. However, a one percent (1%) growth rate was used in order to provide a more conservative analysis. The 1% growth rate was utilized for two years to get current counts (2023) since the traffic counts utilized are from 2021. 2021 traffic counts and growth rate calculations are attached in **Appendix C**.

Approximately 25% of the vehicles entering and exiting the site are anticipated to utilize West Bay Drive to the west while approximately 60% of the vehicles entering and exiting the site are anticipated to utilize West Bay Drive to the east and additionally, approximately 15% of the vehicles entering and exiting the site are anticipated to utilize Clearwater-Largo Road to the north.

The resulting percentages were applied to the trip generation estimates shown in **Table 1** to estimate project trips within the vicinity of the project site. The distribution of net new project traffic, in terms of trip percentages, is shown in **Figure 2.**

The p.m. peak-hour project traffic is shown in **Figure 3.**

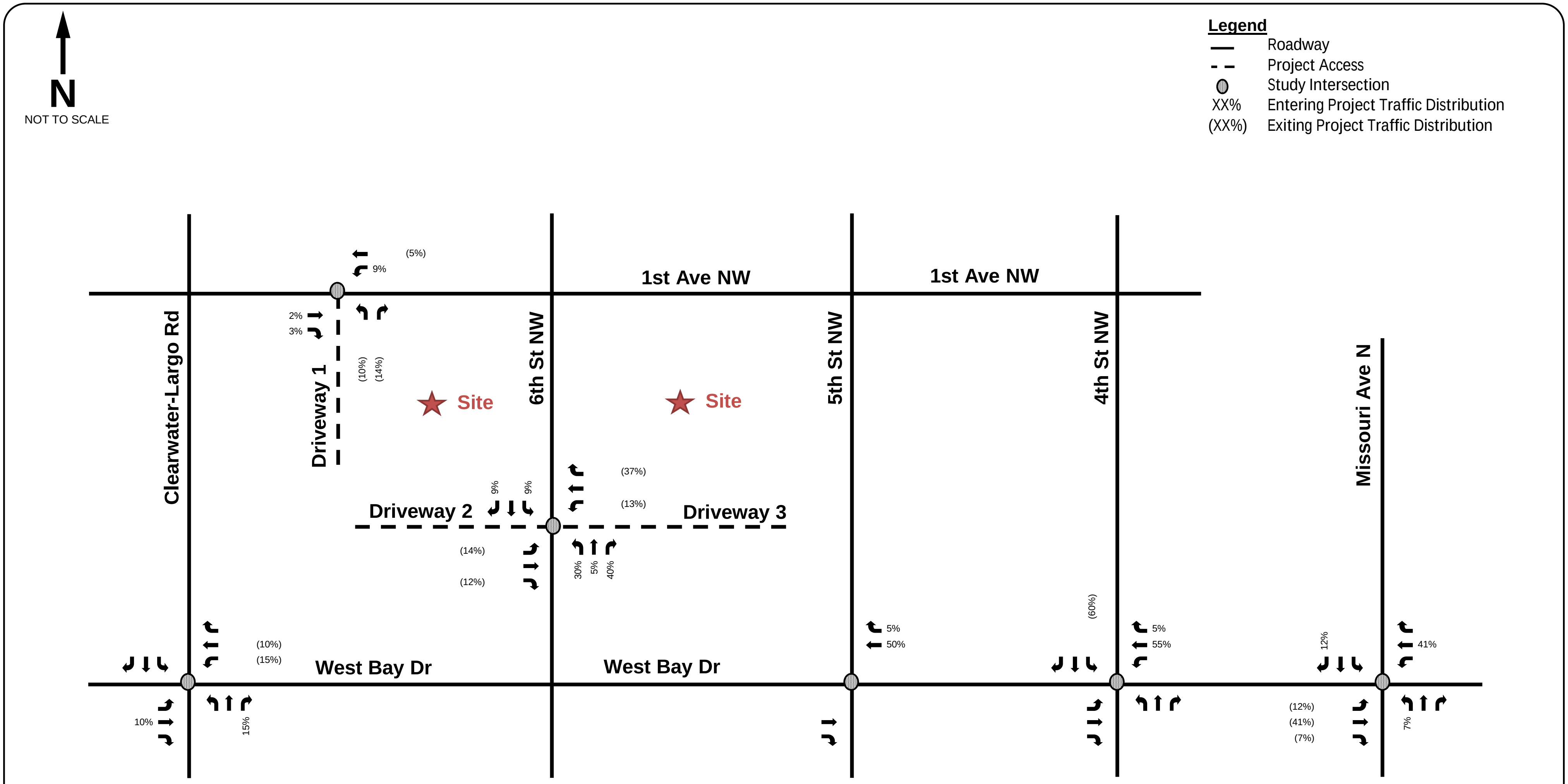

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Figure 2
Project Traffic Distribution
West Bay Largo Mixed-Use Development
City of Largo, Florida

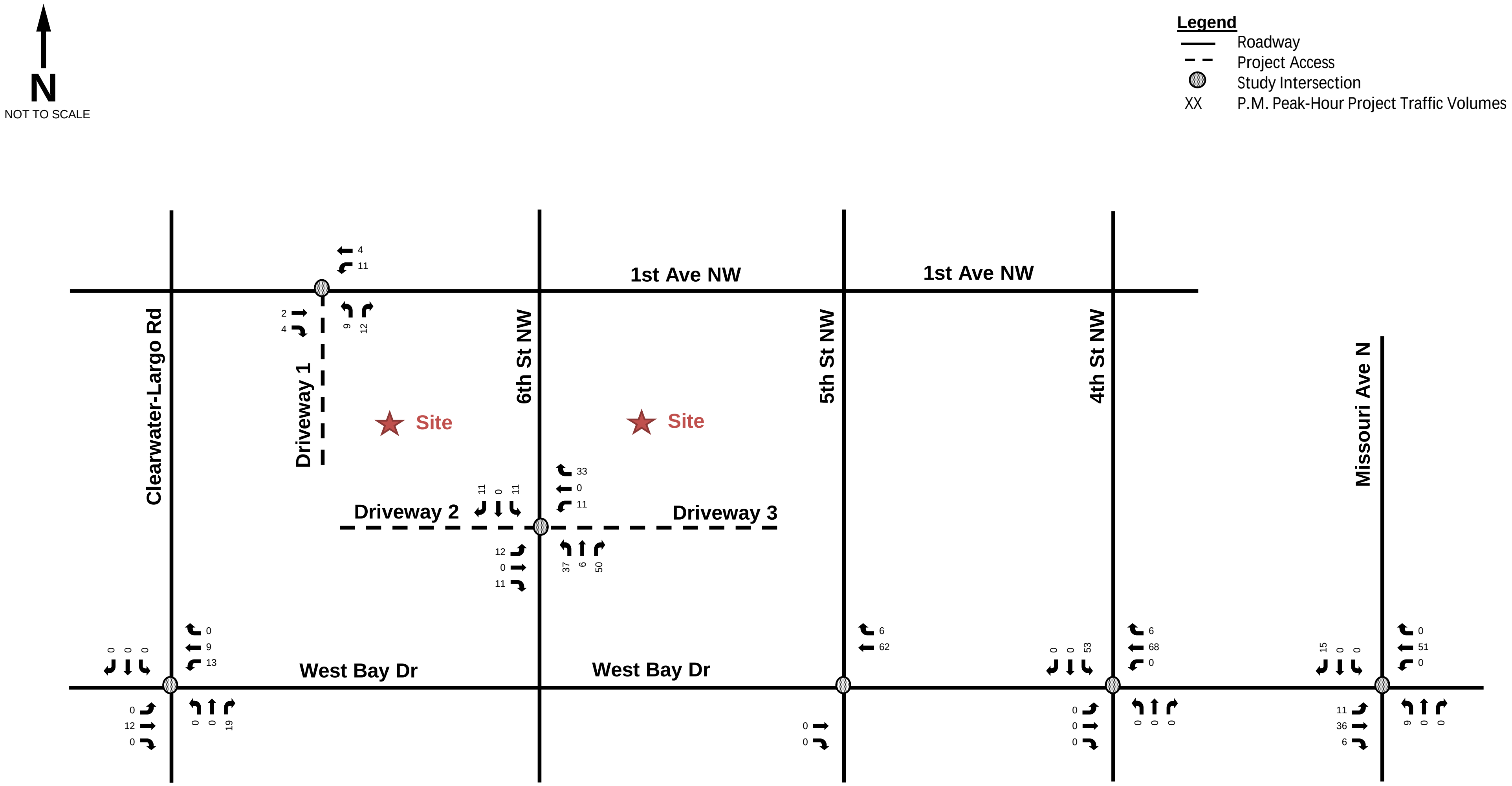

Figure 3
P.M. Peak-Hour Project Traffic Volumes
West Bay Largo Mixed-Use Development
City of Largo, Florida

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SCHEDULED IMPROVEMENTS

A review of the Five-Year Work Program for the City of Largo, Pinellas County, and FDOT District Seven shows roadway capacity projects in the study area which are scheduled to be funded within five years. Complete Street improvements, including mid-block pedestrian crossings, have been constructed along West Bay Drive.

Additionally, there is a project in the City of Largo Capital Improvements Program (CIP) for 4th Street NW. The project goal was to develop a multimodal street to provide increased transportation capacity through multimodal improvements. The West Bay mixed-use project will be coordinated with the City Hall project and is anticipated to upgrade substandard sidewalk sections and construct a multi-use path along the corridor from 8th Avenue NW to Rosery Road.

A project is also identified for Clearwater-Largo Road to retrofit the roadway between Clearwater-Largo Road from West Bay Drive to 4th Avenue SW with median islands, streetscaping, and pedestrian crossing improvements.

Based on a previously approved traffic study (Largo City Hall, October 2021), a geometric improvement at the intersection of West Bay Drive & 4th Street NW was included in the traffic analysis. The geometric improvement, approved by the City of Largo, includes an exclusive 225-foot southbound left-turn lane to help decrease the queue along 4th Street NW. The addition of the southbound-left turn lane is anticipated to be completed by late 2024. Therefore, this improvement was assumed for future conditions and will be detailed later in this report.

STUDY AREA DETERMINATION

The study area was agreed upon with City of Largo staff and was based upon the *2022 Annual Level of Service Report* for Forward Pinellas and consists mainly of the adjacent roadway segments. The study area intersections included were discussed with City of Largo staff during the methodology phase. Additionally, per Forward Pinellas MPO *Traffic Impact Study Methodology*, study area roadway segments are those with the project traffic representing 1.0% or greater of the available roadway capacity up to a maximum radius of two miles from the project site. However, the study area roadway segments were chosen based on the discussions made during the methodology phase.

The study area roadway segments were determined to be the following:

- 1st Avenue Northwest from 4th Street Northwest to Clearwater-Largo Road
- East Bay Drive from 4th Street Northwest to Missouri Avenue
- West Bay Drive from 4th Street Northeast to 6th Street Northwest
- 4th Street Northwest from 1st Avenue Northwest to West Bay Drive
- 5th Street Northwest from 1st Avenue Northwest to West Bay Drive
- 6th Street Northwest from 1st Avenue Northwest to West Bay Drive
- Clearwater-Largo Road from Belleair Road to Ulmerton Road

Additionally, the study intersections were determined to be the following:

- West Bay Drive & Missouri Avenue
- West Bay Drive & 4th Street Northwest
- West Bay Drive & Clearwater-Largo Road

The *2022 Annual Level of Service Report* for Forward Pinellas is attached in **Appendix D**.

EXISTING TRAFFIC VOLUMES

Existing traffic conditions were evaluated within the study network for the p.m. peak-hour. A determination of the impact of the existing traffic on the roadway network was made, including operating conditions for the intersections and roadway segments within the study area. The procedures used in this analysis are discussed below.

West Bay Drive is currently a 4-lane undivided roadway that runs east-west adjacent to the site with a posted speed limit of 35 miles per hour. Vehicle turning movement volume counts were conducted on West Bay Drive during the p.m. peak period (4:00 p.m. to 6:00 p.m.) on April 11, 2023 to quantify existing peak-hour conditions within the study area. The vehicle turning movement volume counts were conducted on the following intersections:

- West Bay Drive & Missouri Avenue
- West Bay Drive & Clearwater-Largo Road

However, due to the construction of the Largo City Hall project, temporary road closures on 4th Street NW, 5th Street NW, 6th Street NW, and Ridge Road NW were in effect. Therefore, traffic counts along those road segments are not usable. Therefore, vehicle turning movements volume counts conducted on West Bay Drive during the p.m. peak period (4:00 p.m. to 6:00 p.m.) on August 18, 2021 were grown by an annual growth rate of 1.0% for two years to determine the 2023 existing counts. The vehicle turning movement volume counts were conducted on the following intersections:

- West Bay Drive & 4th Street Northwest
- West Bay Drive & 5th Street Northwest

The vehicle counts at the study intersections were adjusted to reflect peak-season conditions. This modification was performed using the (FDOT) peak-season conversion factor (PSCF), which corresponds to the data collection date for Pinellas County. The PSCF and the respective 2021 and 2023 turning movement counts at the study intersections are provided in **Appendix E** and the existing seasonally adjusted traffic volumes are provided in **Figure 4**.

In addition, Pursuant to the Community Planning Act of 2011, existing deficiencies (such as the section of East Bay Drive from 4th Street NE to Missouri Avenue) are not the responsibility of the developer. This will be further explained later in the report.

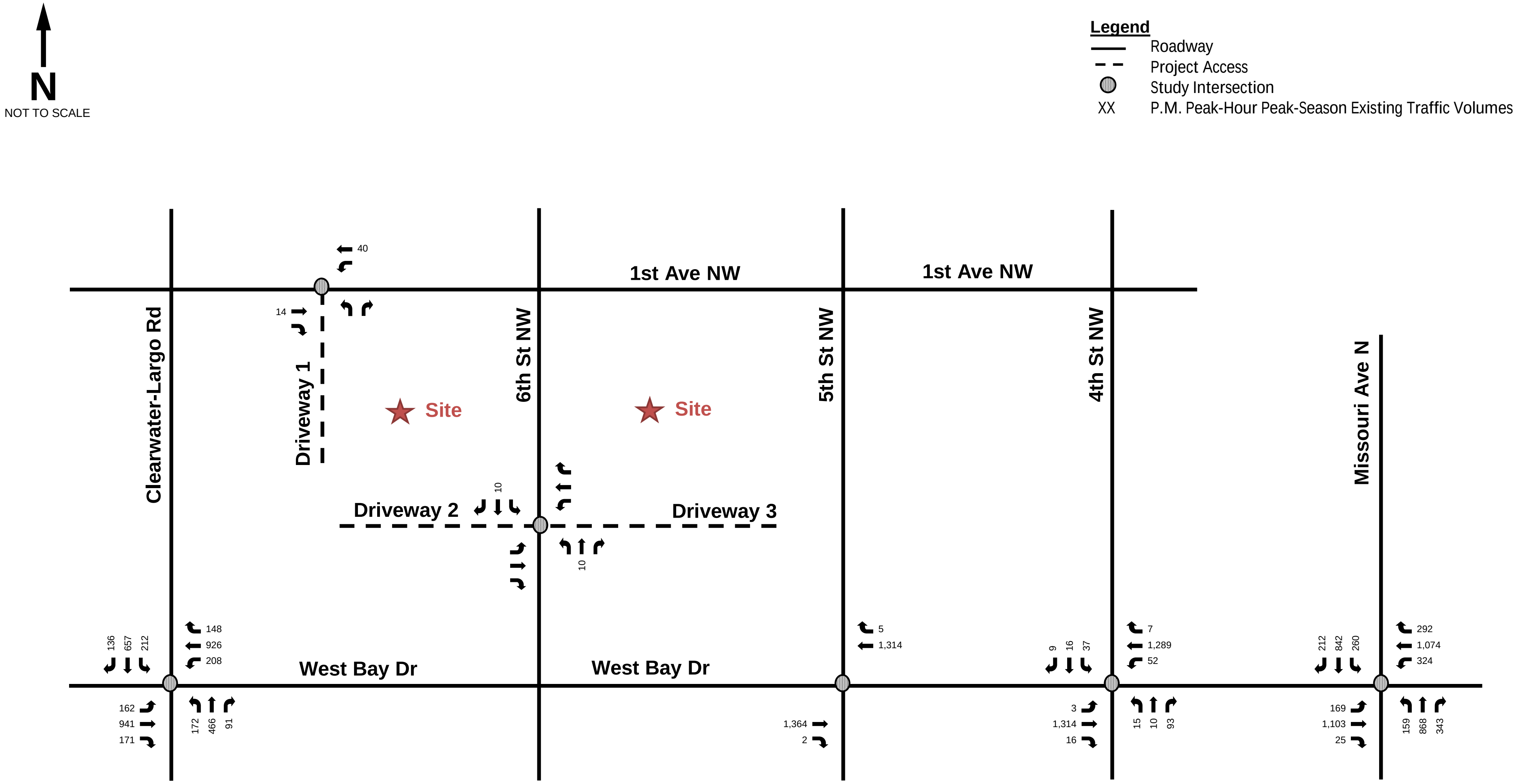

Figure 4
2023 Existing P.M. Peak-Hour Peak-Season Traffic Volumes
West Bay Largo Mixed-Use Development
City of Largo, Florida

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FUTURE TRAFFIC CONDITIONS

Future traffic volumes consist of two components: project traffic and future background traffic (non-project) traffic estimates. Future background traffic is defined as expected non-project traffic on the roadway network in the future year at buildout of the proposed project. For the purposes of this analysis, it was determined that 2026 would be the buildout year of the development. Therefore, 2026 conditions were evaluated as the “future” year scenario.

As previously identified earlier in the report, a growth rate, determined by using FDOT historical Annual Average Daily Traffic (AADT) information for three nearby roadway segments of State Road 686/East Bay Drive (East of US Alt 19), US Alt 19 (South of 4th Avenue Northwest), and Clearwater-Largo Road (North of West Bay Drive), was initially calculated as -2.49%. However, a 1% growth rate was used in order to provide a conservative analysis.

Traffic volumes associated with vested developments in the area (Largo City Hall) were considered in the development of background traffic estimates. Existing traffic volumes were added to the trips associated with vested developments to develop future background volumes for the p.m. peak-hour.

The p.m. peak-hour background (2026) volumes are identified in **Figure 5.** The net, new project traffic volumes identified in **Figure 3** were then added to the background volumes to develop p.m. peak-hour total (2026) volumes identified in **Figure 6.** The growth rate calculations are attached in **Appendix C**.

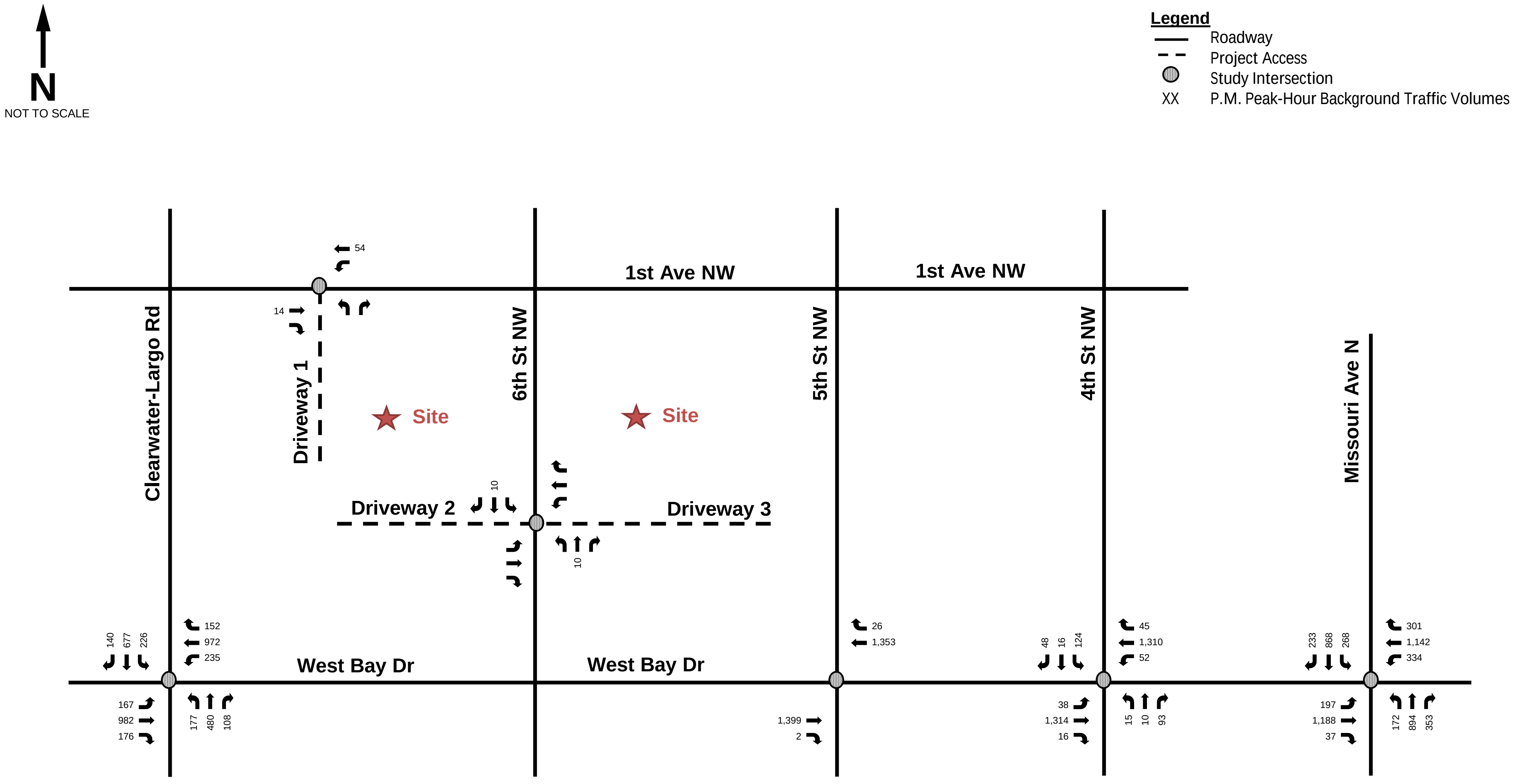

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Figure 5
2026 Background P.M. Peak-Hour Traffic Volumes
West Bay Largo Mixed-Use Development
City of Largo, Florida

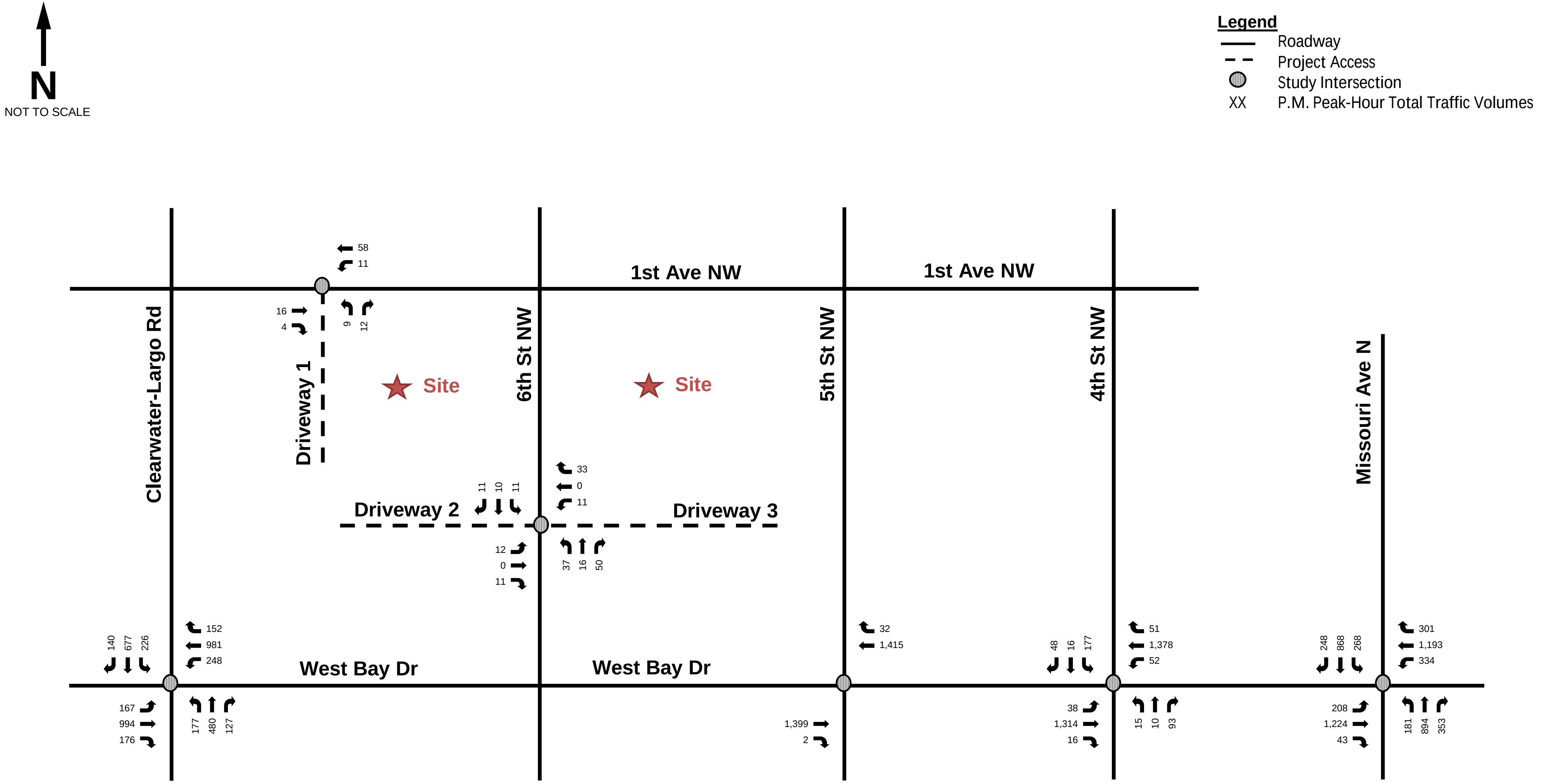

Figure 6
2026 Total P.M. Peak-Hour Traffic Volumes
West Bay Largo Mixed-Use Development
City of Largo, Florida

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ROADWAY CAPACITY ANALYSIS

A roadway capacity analysis was conducted for the study area roadway segments based upon the service volumes included in the 2022 Forward Pinellas MPO L*evel of Service Report.* The previously identified study area roadway segments were evaluated for existing, future background, and future total volumes during the p.m. peak-hour. The following roadway segments were analyzed:

- 1st Avenue Northwest from 4th Street Northwest to Clearwater-Largo Road
- East Bay Drive from 4th Street Northeast to Missouri Avenue
- West Bay Drive from 4th Street Northwest to 6th Street Northwest
- 4th Street Northwest from 1st Avenue Northwest to West Bay Drive
- 5th Street Northwest from 1st Avenue Northwest to West Bay Drive
- 6th Street Northwest from 1st Avenue Northwest to West Bay Drive
- Clearwater-Largo Road from Belleair Road to Ulmerton Road

Roadway volumes exiting one study area intersection may not be equivalent to the entering intersection turning movement volumes at the next intersection due to driveway locations between study intersections or minor fluctuations in travel patterns between time periods. To evaluate the study roadway segments based upon typical roadway conditions, volumes for the study roadway segments were determined as the average of entering and exiting vehicles from adjacent street intersections during the p.m. peak-hour.

The LOS D service volumes included in the *Pinellas County: 2022 Annual Level of Service Report* were utilized in the analysis. Service volumes for roadways that were not included in the *Pinellas County: 2022 Annual Level of Service Report,* were found in FDOT's *Generalized Peak Hour Two-Way Volume Tables*.

Some of the study roadway segments are under construction due to the Largo City Hall project, and some of the study roadway segments are temporary closed. Therefore, traffic counts from 2021 were utilized for the roadway segments that were affected by the road closures. The peak-hour roadway volumes were grown by a one percent (1.0%) growth rate for two (2) years to determine existing (2023) volumes. However, the roadways that were not affected by the road closures, utilized traffic counts from 2023.

Additionally, vested trips from the approved Largo City Hall project were added to volumes. However, certain roadways did not include any vested trips, therefore, a 1% growth rate was applied to get the future background (year 2026) volumes. The vested traffic volumes are shown in **Appendix C**. Total roadway volumes for the roadway analysis were calculated by adding project traffic to the future 2026 background roadway volumes.

As indicated in **Table 2**, an analysis was provided for existing (year 2023), future background (year 2026 without project), and future total (year 2026 with project) traffic during the p.m. peak-hour.

The roadway analysis shows that all study roadway segments are anticipated to have sufficient capacity at buildout of the proposed development based upon the peak-hour directional capacity volume found in the *Pinellas County: 2022 Annual Level of Service Report*, except for the study roadway segment of East Bay Drive from 4th Street NE to Missouri Avenue. Pursuant to the Community Planning Act of 2011, existing deficiencies (such as the section of East Bay Drive from 4th Street NE to Missouri Avenue) are not the responsibility of the developer.

Supporting documentation for the study area roadway analysis is provided in **Appendix D,** including the *Pinellas County: 2022 Annual Level of Service Report* and FDOT's Generalized LOS Volume Tables.

Table 2: Roadway Analysis (P.M. Peak-Hour)

ROADWAY	FROM	TO	SERVICE VOLUMES		DIRECTIONAL EXISTING (2021) VOLUMES[3]	DIRECTIONAL EXISTING (2023) VOLUMES	DIRECTIONAL BACKGROUND (2026) VOLUMES[6]	PROJECT TRAFFIC			DIRECTIONAL FUTURE TOTAL (2026) VOLUME	V/C RATIO	EXCEED SERVICE VOLUME?
			EXISTING LANEAGE	LOS D SERVICE VOLUME PEAK-HOUR DIRECTIONAL VOLUME				DIRECTION	PROJECT TRAFFIC ASSIGNMENT	PROJECT TRAFFIC VOLUME			
1st Avenue NW	4th St NW	Clearwater-Largo Rd	2	718[2]	36	37[5]	165	Eastbound	60%	74	239	0.33	No
					21	21[5]	95	Westbound	5%	6	101	0.14	No
East Bay Drive	4th St NE	Missouri Ave	4	1,683[1]	--	1,689[4]	1,740*	Eastbound	41%	51	1,791	1.06	Yes[7]
					--	1,673[4]	1,724*	Westbound	41%	51	1,791	1.06	Yes[7]
West Bay Drive	Missouri Ave	6th St NW	4	1,683[1]	--	1,284[4]	1,370	Eastbound	60%	74	1,444	0.86	No
					--	1,430[4]	1,488	Westbound	60%	74	1,444	0.86	No
	6th St NW	Clearwater-Largo Rd	4	1,683[1]	--	1,232[4]	1,269*	Eastbound	25%	31	1,300	0.77	No
					--	1,270[4]	1,308*	Westbound	25%	31	1,300	0.77	No
	Clearwater-Largo Rd	Indian Rocks Rd	4	1,683[1]	--	1,261[4]	1,299*	Eastbound	10%	12	1,311	0.78	No
					--	1,222[4]	1,259*	Westbound	10%	12	1,311	0.78	No
4th Street NW	1st Ave NW	West Bay Dr	2	718[2]	28	29[5]	102	Northbound	5%	6	108	0.15	No
					72	73[5]	199	Southbound	60%	74	273	0.38	No
5th Street NW	1st Ave NW	West Bay Dr	2	718[2]	5	5[5]	26	Northbound	5%	6	32	0.04	No
6th Street NW	Woodrow Ave	1st Ave NW	2	718[2]	20	20[5]	21*	Northbound	0%	0	21	0.03	No
					20	20[5]	21*	Southbound	10%	12	33	0.05	No
	1st Ave NW	West Bay Dr	2	718[2]	50	51[5]	53*	Northbound	75%	93	146	0.20	No
					50	51[5]	53*	Southbound	25%	31	84	0.12	No
Clearwater-Largo Rd	Belleair Rd	West Bay Dr	4	1,683[1]	--	768[4]	791*	Northbound	13%	16	807	0.48	No
					--	995[4]	1,025*	Southbound	13%	16	807	0.48	No
	West Bay Dr	Ulmerton Rd	6	2,646[1]	--	721[4]	743*	Northbound	15%	19	762	0.29	No
					--	1,025[4]	1,056*	Southbound	15%	19	762	0.29	No

Notes:

1. Based on 2022 Forward Pinellas LOS Report (2021 data) (East Bay Drive utilized Directional volumes from the roadway of West Bay Drive from Missouri Avenue to Clearwater-Largo Road since the roadways are adjacent to one another)
2. Based on Table 4 of FDOT's Generalized Level of Service Volume Tables (1,330*0.6*0.9) = 718
3. Based on p.m. peak-hour peak-season turning movement counts collected in 2021, due to temporary road closures occurring in 2023
4. Based on p.m. peak-hour peak-season turning movement counts collected in 2023
5. Based on a 1% growth rate for two years
6. Added vested trips from the approved Largo City Hall project, however, roadways without vested trips (*) will utilize a 1% growth rate for three years
7. Pursuant to the Community Planning Act of 2011, existing deficiencies (such as the section of East Bay Drive from 4th Street NE to Missouri Avenue) are not the responsibility of the developer

INTERSECTION ANALYSIS

An intersection analysis was conducted during the p.m. peak-hour for the existing, future background, and future total conditions. The intersection analysis was conducted in *Synchro Version 11* software, which utilizes the methodologies provided in the *Highway Capacity Manual (HCM), 6th Edition.* The study intersections were analyzed for a maximum volume-to-capacity (v/c) ratio by approach.

The volume to capacity ratio is a measure of how close travel demand is to reaching the roadway's physical capacity, which is calculated by dividing the traffic volume by the capacity for a system element. A v/c ratio greater than or equal to 1.0 indicates that the approach is operating at or above capacity. A v/c ratio for a movement that is less than 1.0 is considered to operate acceptably.

Existing lane geometry and traffic controls were used in the existing conditions analysis. In addition, improvements discussed in the Largo City Hall TIA submitted on October 10, 2021, were used in the future background and future total conditions analysis. Improvements included an exclusive southbound left-turn lane at the intersection of West Bay Drive & 4th Street NW. Current signal timing information was provided by Pinellas County and is included in **Appendix F.** As documented in the study area section of this report, the following intersections were included in the analysis:

- West Bay Drive & Missouri Avenue
- West Bay Drive & 4th Street Northwest
- West Bay Drive & Clearwater-Largo Road

As indicated in **Table 3**, the study intersections are anticipated to operate with a v/c ratio below a 1.0 during the p.m. peak-hour in existing (2023), future background (2026 without project), and future total (2026 with project) scenarios.

Signal timings and Synchro output worksheets for the operational analysis are included in **Appendix F**.

Table 3: Intersection Analysis (P.M. Peak-Hour)

Existing Conditions (2023) v/c Ratio[1]

(Background Conditions (2026) v/c Ratio) [2]

[Total Conditions (2026) v/c Ratio] [3]

Intersection	Control Type[4]	Eastbound			Westbound			Northbound			Southbound			Delay	Overall LOS
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
West Bay Drive & Missouri Avenue	Signalized	0.84	0.85		0.95	0.75	0.45	0.82	0.76	0.97	0.94	0.67	0.54	66.6	E
		(0.85)	(0.90)		(0.95)	(0.78)	(0.46)	(0.83)	(0.76)	(0.97)	(0.94)	(0.67)	(0.58)	(68.3)	(E)
		[0.86]	[0.93]		[0.94]	[0.83]	[0.47]	[0.83]	[0.76]	[0.97]	[0.94]	[0.68]	[0.63]	[69.8]	[E]
West Bay Drive & 4th Street NW[5]	Signalized	0.01	0.50		0.16	0.45		0.19		0.87	0.54			8.7	A
		(0.17)	(0.59)		(0.18)	(0.55)		(0.19)		(0.87)	(0.54)	(0.21)		(15.3)	(B)
		[0.21]	[0.62]		[0.19]	[0.60]		[0.19]		[0.87]	[0.63]	[0.19]		[17.8]	[B]
West Bay Drive & Clearwater-Largo Road	Signalized	0.84	0.83		0.53	0.69		0.85	0.93		0.51	0.95		67.6	E
		(0.84)	(0.85)		(0.56)	(0.70)		(0.85)	(0.93)		(0.55)	(0.95)		(68.4)	(E)
		[0.84]	[0.86]		[0.59]	[0.71]		[0.85]	[0.93]		[0.58]	[0.95]		[68.9]	[E]

Notes:

1. Existing Conditions: Year 2023 Traffic volumes
2. Background Conditions: Year 2026 Traffic volumes = Existing (2023) Traffic Volumes + (vested trips from Largo City Hall or a 1% annual growth)
3. Total Conditions: Background (Year 2026) Traffic Volumes + Project Traffic Volumes
4. Signal timings were optimized to maintain acceptable volume/capacities at the study intersections
5. Includes scheduled improvements (addition of the exclusive southbound left-turn lane) for the Background and Total Conditions Scenarios

TURN LANE ANALYSIS

Turn lane warrant thresholds were reviewed to determine the need for exclusive turn lanes at the proposed project driveways. Guidelines for determining the need for a right-turn lane were utilized based upon the FDOT *Access Management Guidebook* which recommends an exclusive right-turn lane when the right-turning movements are 80 vehicles per hour for a roadway with a posted speed limit below 45 miles per hour (mph). Guidelines for determining the need for a left-turn lane were utilized based upon the National Cooperative Highway Research Program (NCHRP) *Report 745*.

As documented previously, access to the site is provided through the following existing access connections:

- Driveway 1: Full-access connection along 1st Avenue Northwest (Building A)
- Driveway 2: Full-access connection along 6th Street Northwest (Building A)
- Driveway 3: Full-access connection along 6th Street Northwest (Building B)

If any turn-lanes are warranted, then the total turn lane length was analyzed based upon the deceleration distance required by the FDOT Florida Design Manual (FDM) *Exhibit* 212-1 and the calculated queue length from the methodologies of the *Highway Capacity Manual (HCM) 6th Edition*.

Project Driveway 1: Full-access connection along 1st Avenue NW (Northernmost Driveway)

As identified in **Figure 6**, there are anticipated to be 4 eastbound right-turns per hour during the p.m. peak-hour following buildout of the proposed development. Therefore, an exclusive eastbound right-turn lane is not warranted based upon the FDOT *Access Management Guidebook*.

Additionally, there are anticipated to be 11 westbound left-turns per hour during the p.m. peak-hour following buildout of the proposed development and approximately 20 opposing trips. Therefore, an exclusive left-turn lane is not warranted based on NCHRP 745. The 95th percentile westbound left-turn queue is anticipated to be less than one (1) vehicle at Project Driveway 1, based upon the results of the intersection analysis.

Project Driveway 2: Full-access connection along 6th Street NW (Westernmost Driveway)
As identified in **Figure 6**, there are anticipated to be 11 southbound right-turns per hour during the p.m. peak-hour following buildout of the proposed development. Therefore, an exclusive southbound right-turn lane is not warranted based upon the FDOT *Access Management Guidebook*.

Additionally, there are anticipated to be 37 northbound left-turns per hour during the p.m. peak-hour following buildout of the proposed development and approximately 32 opposing trips. Therefore, an exclusive left-turn lane is not warranted based on NCHRP 745 standards. The 95th percentile northbound left-turn queue is anticipated to be less than one (1) vehicle at Project Driveway 2, based upon the results of the intersection analysis.

Project Driveway 3: Full-access connection along 6th Street NW (Easternmost Driveway)
As identified in **Figure 6**, there are anticipated to be 50 northbound right-turns per hour during the p.m. peak-hour following buildout of the proposed development. Therefore, an exclusive northbound right-turn lane is not warranted based upon the FDOT *Access Management Guidebook*.

Additionally, there are anticipated to be 11 southbound left-turns per hour during the p.m. peak-hour following buildout of the proposed development and approximately 103 northbound opposing trips. Therefore, an exclusive southbound left-turn lane is not warranted based on NCHRP 745 standards for a three-legged intersection. The 95th percentile southbound left-turn queue is anticipated to be less than one (1) vehicle at Project Driveway 3, based upon the results of the intersection analysis.

Supporting documentation for the turn lane evaluation are provided in **Appendix G** including the FDOT Access Management Guidebook, FDM Exhibit 212-1, and NCHRP Report 745.

MULTIMODAL ANALYSIS

Existing and planned multimodal facilities within the vicinity of the proposed development were reviewed. An inventory is provided below that includes existing and planned facilities for pedestrians, bicyclists, and transit users.

Pedestrians

Sidewalks currently exist along both sides of West Bay Drive. A mid-block crossing also exists west of West Bay Drive & 5th Street NW and at West Bay Drive & Ulmer Park. The site plan is included in the **Appendix A** and illustrates the proposed sidewalk connections along the site. Pedestrian facilities will be provided on site as well as additional gathering spaces in the center of the site. As required by the West Bay Drive Community Redevelopment District, the pedestrian zone will include ten feet of sidewalk area as well as a landscaping area.

Bicyclists

Exclusive bike paths do not currently exist along the project site.

Transit

Transit service on West Bay Drive is adjacent to the project site and is served by the Pinellas Suncoast Transit Authority (PSTA) for Route 52. The nearest transit stop along westbound West Bay Drive includes a bus shelter and bench and is located west of the intersection of West Bay Drive & 5th Street NW. The transit stop along eastbound West Bay Drive does not include a transit shelter or bench.

On-Street Parking

There are currently six (6) parking spaces along 1st Avenue NW (south side) on the north side of the project site, two (2) parking spaces along 6th Avenue NW (east side), and six (6) parking spaces along West Bay Drive (north side) on the south side of the project site.

TRANSPORTATION MANAGEMENT STRATEGIES

The West Bay Largo Mixed-Use development will encourage traffic reduction by promoting walkability through site design features. The site will promote a pedestrian friendly design with gathering space and connected walking paths. The site also includes a mixture of uses of residential and retail space. People will be able to enjoy access to the gathering site and amenities.

The site will be connected to the overall pedestrian network with the existing mid-block crosswalks along West Bay Drive. The site will foster multimodal transportation by providing bike storage. The design will follow the West Bay Drive Community Redevelopment District Plan including the requirements for the pedestrian zone in order to create a pedestrian-oriented urban environment.

CONCLUSION

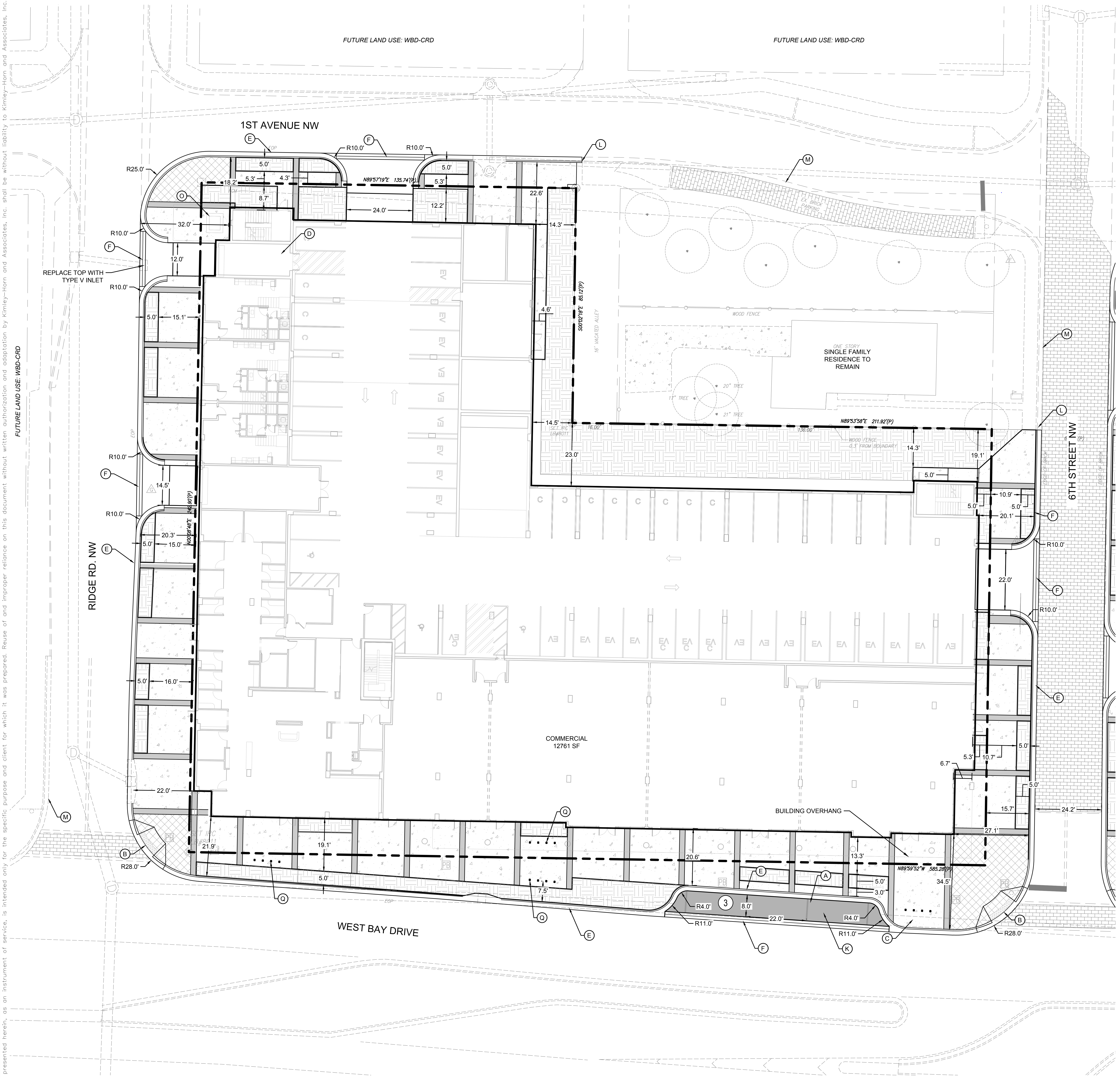
The West Bay Largo Mixed-Use development is proposed in the northwest (Building A) and northeast (Building B) quadrants of the intersection of West Bay Drive & 6th Street Northwest. The project site is approximately 2.57 acres and is proposed to include up to 276 multi-family housing units (low-rise) and 27,300 square feet of retail use. This Traffic Impact Analysis (TIA) provides an analysis of the site, including vehicular and multimodal facilities.

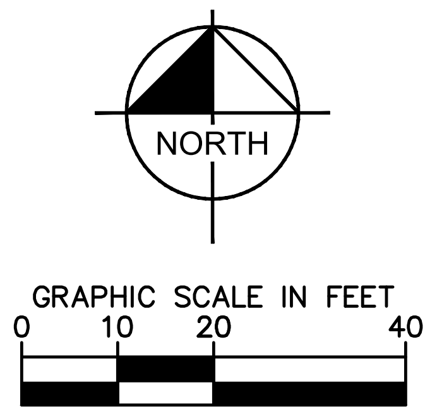
Based upon the results of the roadway segment analysis conducted for the existing, future background, and the future total roadway conditions, the analysis shows that all study roadway segments are anticipated to have sufficient capacity, except for the study roadway segment of East Bay Drive from 4th Street NE to Missouri Avenue. Pursuant to the Community Planning Act of 2011, existing deficiencies (such as the section of East Bay Drive from 4th Street NE to Missouri Avenue) are not the responsibility of the developer.

Based on a previously approved traffic study (Largo City Hall, October 2021), a geometric improvement at the intersection of West Bay Drive & 4th Street NW was included in the Traffic Analysis. The geometric improvement, approved by the City of Largo, includes an exclusive 225-foot southbound left-turn lane to help decrease the queue along 4th Street NW. The addition of the southbound-left turn lane is anticipated to be completed by Late 2024. Therefore, this improvement was assumed for future conditions in the intersection analysis.

Based upon the results of the intersection analysis conducted, the study intersections are anticipated to operate with a v/c ratio below a 1.0 during the p.m. peak-hour in existing (2023), future background (2026 without project), and future total (2026 with project) scenarios.

APPENDIX A:
Site Plan, and
Approved Methodology





SITE DATA TABLE - BUILDING A

SITE DATA TABLE - PMG LARGO MULTI-FAMILY MIXED USE			
PROPOSED USE: MIXED USE PROFESSIONAL DEVELOPMENT			
LAND USE MAP DESIGNATION: WBD-CRD, MUC			
LOT AREA: 1.31 ACRES (57,109 SF)			
PROPOSED DWELLING UNITS: 121 UNITS			
BUILDING AREA:	BUILDING FOOTPRINT (SF)	GFA (SF)	GFA WITH EXCLUSIONS (SF)
	±45,815	±216,854	N/A
		RESIDENTIAL - ±128,616 GENERAL COMMERCIAL - ±18,202	
EXISTING BUILDING AREA: 0.00 ACRES (0 SF)			
STANDARD	**EXISTING**	**PROPOSED**	**MIN./MAX. REQUIRED**
FLOOR AREA RATIO			
% FAR (TOTAL):	0.00%		400% (4.0)
IMPERVIOUS SURFACE			
% ISR (TOTAL):	0.00%	90%	90% (.90)
BUILDINGS:	0	1.05 AC (45,721 SF)	
PARKING, DRIVES, & SIDEWALKS:	0.00 AC (000000 SF)	0.00 AC (000000 SF)	
TOTAL PARKING SPACES:	0	165	SEPARATE TABLE PROVIDED
GENERAL: (PAVED)	0	159	
HANDICAPPED:	0	6	
SETBACKS:			
NORTH: 1ST AVENUE NW	N/A	18.60	20 FT. FROM BACK OF CURB
EAST: 6TH STREET NW	N/A	20.60	20 FT. FROM BACK OF CURB
WEST: RIDGE ROAD NW	N/A	20.20	20 FT. FROM BACK OF CURB
SOUTH: WEST BAY DRIVE	N/A	20.60	20 FT. FROM BACK OF CURB
NOTE(S): LANDSCAPE BUFFER REQUIREMENTS SUPERSEDE BUILDING SETBACKS			
FLOOD ZONE: ZONE "X" AREA OF MIN. FLOOD HAZARD			

PARKING ANALYSIS TABLE - BUILDING A

EXISTING PARKING SPACES	3 SPACES (ON-STREET)			
PROPOSED PARKING SPACES				
	ON-STREET		3 SPACES	
	PARKING GARAGE		165 SPACES	
PROP. ACCESSIBLE SPACES				
	ON-STREET		0 SPACES	
	PARKING GARAGE		6 SPACES	
PROP. ELECTRIC VEHICLE SPACES				
	ON-STREET		0 SPACES	
	PARKING GARAGE		8 SPACES (INSTALLED)	
			30 SPACES (READY)	
PROP. COMPACT SPACES				
	ON-STREET		0 SPACES	
	PARKING GARAGE		34 SPACES	
			4 SPACES (E.V.)	
PROPOSED TOTAL PARKING SPACES	165 SPACES			
	MINIMUM		MAXIMUM	
REQUIRED PARKING	RESIDENTIAL MF (1 PER DU)	121 SPACES	RESIDENTIAL MF (2.5 PER DU)	303 SPACES
	GENERAL COMMERCIAL (1 PER 400 GFA)	38 SPACES	GENERAL COMMERCIAL (1 PER 250 GFA)	60 SPACES
REQUIRED TOTAL PARKING SPACES		159 SPACES		363 SPACES
REQUIRED BICYCLE PARKING	MINIMUM		MAXIMUM	
(20% OF REQUIRED MINIMUM PARKING, UP TO 50 SPACES)	32 BIKE SPACES		N/A	
(25% WEATHER PROTECTED)	8 BIKE SPACES		N/A	
PROPOSED BICYCLE PARKING	32 BIKE SPACES			
WEATHER PROTECTED	8 BIKE SPACES			

LEGEND

— — —	PROPERTY BOUNDARY
═	PROPOSED TYPE "F" CURB
Ⓧ	PARKING COUNT
╀	PROPOSED SIGN
■	STANDARD DUTY ASPHALTIC CONCRETE PAVEMENT
▦	EXISTING BRICK TO BE REPLACED PER CITY OF LARGO
▨	CONCRETE PAVER (REFER TO HARDSCAPE PLANS)
▤	LANDSCAPE AREA (REFER TO LANDSCAPE PLANS)

KEYNOTE LEGEND

Ⓐ	ASPHALT PAVEMENT
Ⓑ	SIDEWALK CURB RAMP WITH DETECTABLE WARNING PER CITY OF LARGO STANDARD DETAILS RT-150
Ⓒ	BIKE RACK (SEE DETAIL ON SHEET C-404)
Ⓓ	PROPOSED TRASH COMPACTOR LOCATED WITHIN THE BUILDING
Ⓔ	TYPE F CURB PER FDOT STANDARD PLANS 520-001
Ⓕ	MIAMI DROP CURB PER CITY OF LARGO STANDARD DETAILS RT-130
Ⓖ	ADA PARKING PARKING STALL PER CITY OF LARGO STANDARD DETAILS RT-220
Ⓗ	TYPICAL DRIVEWAY PER CITY OF LARGO STANDARD DETAILS RT-270
Ⓘ	4' CURB TRANSITION PER CITY OF LARGO STANDARD DETAILS RT-270 (TYPICAL)
Ⓚ	PARALLEL PARKING SPACES PER CITY OF LARGO STANDARD DETAILS RT-210
Ⓛ	MATCH EXISTING CURB & GUTTER
Ⓜ	EXISTING TYPE "F" CURB
Ⓝ	BUS STOP RELOCATION
Ⓞ	TRANSFORMER
Ⓟ	STAIRS
Ⓠ	BIKE RACK

DATE
No.
REVISIONS

Kimley»Horn

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REGISTRY NO. 35106

LICENSED PROFESSIONAL
NICOLE E. BERLIN, P.E.
FLORIDA LICENSE NUMBER
92165
DATE:

SCALE AS SHOWN
DESIGNED BY NEB\BDD
DRAWN BY BDD
CHECKED BY JLI

SITE PLAN - BUILDING A

PMG LARGO MULTI-FAMILY
MIXED USE

CITY OF LARGO FLORIDA

DATE
3/22/2023
PROJECT NO.
043797004
SHEET NUMBER
C-400

Plotted By: Inhofer, Jessica Sheet Set: Largo PMG 043797 Layout: C-400 SITE PLAN - BUILDING A April 28, 2023 11:12:05am K:\stp_civil\043797 - pmg\004 - largo\CADD\plansheets\C-Site.dwg
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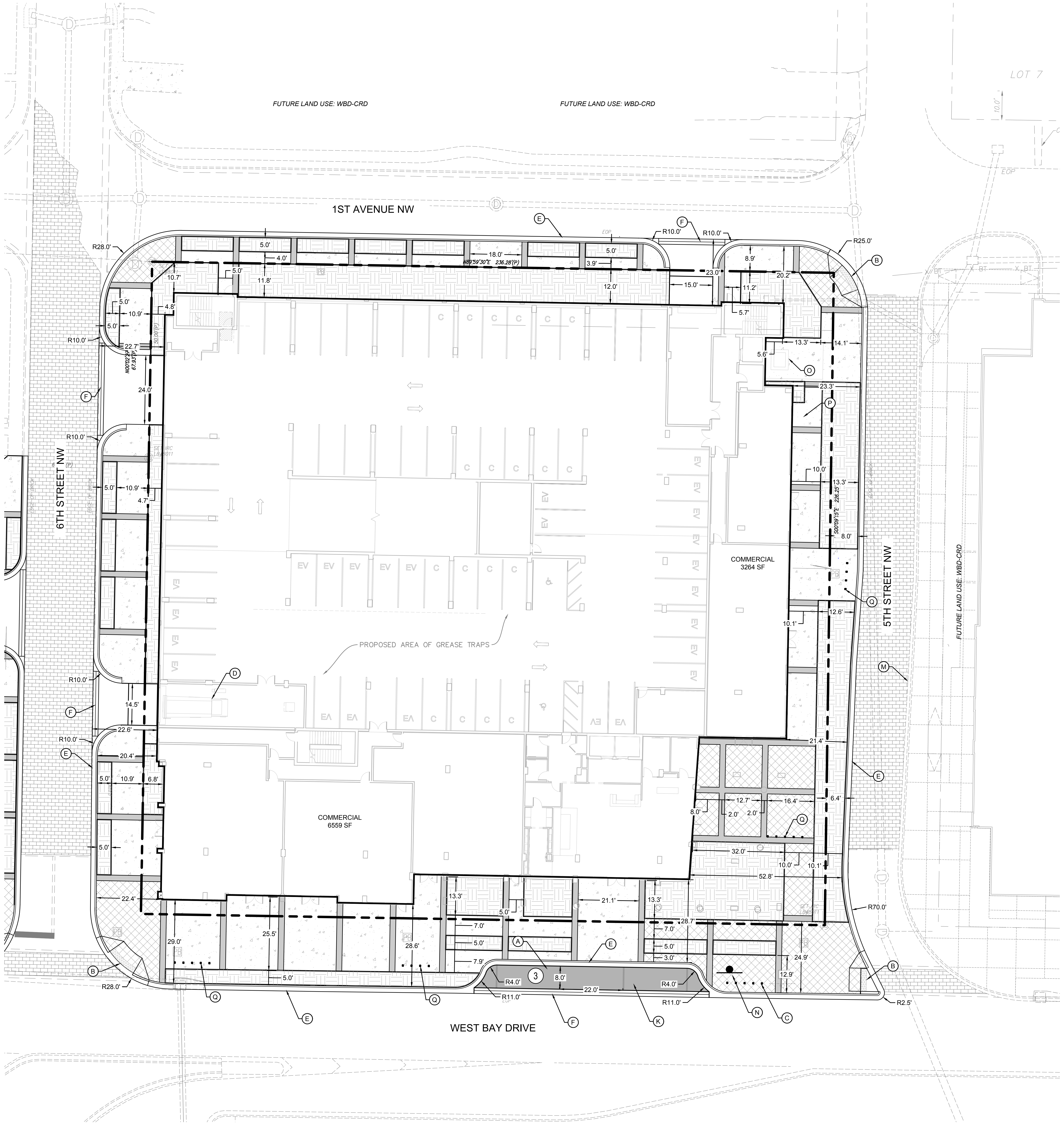

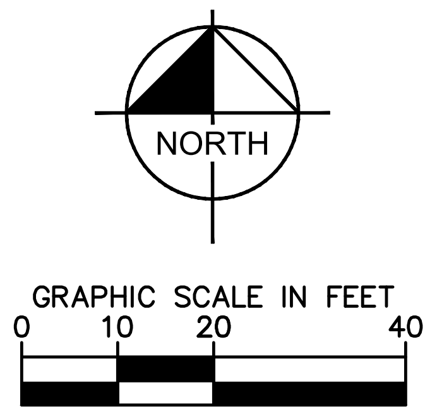

SITE DATA TABLE - BUILDING B

SITE DATA TABLE - PMG LARGO MULTI-FAMILY MIXED USE			
PROPOSED USE: MIXED USE PROFESSIONAL DEVELOPMENT			
LAND USE MAP DESIGNATION: WBD-CRD, MUC			
LOT AREA: 1.23 ACRES (53,540 SF)			
PROPOSED DWELLING UNITS: 155 UNITS			
BUILDING AREA:	BUILDING FOOTPRINT (SF)	GFA (SF)	GFA WITH EXCLUSIONS (SF)
	±42,487	±233,297	N/A
		RESIDENTIAL - ±146,243 GENERAL COMMERCIAL - ±12,600	
EXISTING BUILDING AREA: 0.00 ACRES (0 SF)			
STANDARD	**EXISTING**	**PROPOSED**	**MIN./MAX. REQUIRED**
FLOOR AREA RATIO			
% FAR (TOTAL):	0.00%		400% (4.0)
IMPERVIOUS SURFACE			
% ISR (TOTAL):	0.00%	90%	90% (.90)
BUILDINGS:	0	0.98 AC (42,487 SF)	
PARKING, DRIVES, & SIDEWALKS:	0.00 AC (000000 SF)	0.00 AC (000000 SF)	
TOTAL PARKING SPACES:	0	186	SEPARATE TABLE PROVIDED
GENERAL: (PAVED)	0	180	
HANDICAPPED:	0	6	
SETBACKS:			
NORTH: 1ST AVENUE NW	N/A	16.40	20 FT. FROM BACK OF CURB
EAST: 5TH STREET NW	N/A	21.40	20 FT. FROM BACK OF CURB
WEST: 6TH STREET NW	N/A	20.40	20 FT. FROM BACK OF CURB
SOUTH: WEST BAY DRIVE	N/A	28.60	20 FT. FROM BACK OF CURB
NOTE(S): LANDSCAPE BUFFER REQUIREMENTS SUPERSEDE BUILDING SETBACKS			
FLOOD ZONE: ZONE "X" AREA OF MIN. FLOOD HAZARD			

PARKING ANALYSIS TABLE - BUILDING B

EXISTING PARKING SPACES	3 SPACES (ON-STREET)			
PROPOSED PARKING SPACES				
	ON-STREET		3 SPACES	
	PARKING GARAGE		186 SPACES	
PROP. ACCESSIBLE SPACES				
	ON-STREET		0 SPACES	
	PARKING GARAGE		6 SPACES	
PROP. ELECTRIC VEHICLE SPACES				
	ON-STREET		0 SPACES	
	PARKING GARAGE		9 SPACES (INSTALLED)	
			34 SPACES (READY)	
PROP. COMPACT SPACES				
	ON-STREET		0 SPACES	
	PARKING GARAGE		51 SPACES	
			0 SPACES (E.V.)	
PROPOSED TOTAL PARKING SPACES	186 SPACES			
	MINIMUM		MAXIMUM	
REQUIRED PARKING	RESIDENTIAL MF (1 PER DU)	155 SPACES	RESIDENTIAL MF (2.5 PER DU)	388 SPACES
	GENERAL COMMERCIAL (1 PER 400 GFA)	25 SPACES	GENERAL COMMERCIAL (1 PER 250 GFA)	40 SPACES
REQUIRED TOTAL PARKING SPACES		180 SPACES		428 SPACES
REQUIRED BICYCLE PARKING	MINIMUM		MAXIMUM	
(20% OF REQUIRED MINIMUM PARKING, UP TO 50 SPACES)	36 BIKE SPACES		N/A	
(25% WEATHER PROTECTED)	9 BIKE SPACES		N/A	
PROPOSED BICYCLE PARKING	46 BIKE SPACES			
WEATHER PROTECTED	9 BIKE SPACES			

LEGEND

— — —	PROPERTY BOUNDARY
═══	PROPOSED TYPE "F" CURB
Ⓧ	PARKING COUNT
⊸	PROPOSED SIGN
▩	STANDARD DUTY ASPHALTIC CONCRETE PAVEMENT
▨	EXISTING BRICK TO BE REPLACED PER CITY OF LARGO
▨	CONCRETE PAVER (REFER TO HARDSCAPE PLANS)
▦	LANDSCAPE AREA (REFER TO LANDSCAPE PLANS)

KEYNOTE LEGEND

Ⓐ	ASPHALT PAVEMENT
Ⓑ	SIDEWALK CURB RAMP WITH DETECTABLE WARNING PER CITY OF LARGO STANDARD DETAILS RT-150
Ⓒ	BIKE RACK (SEE DETAIL ON SHEET C-404)
Ⓓ	PROPOSED TRASH COMPACTOR LOCATED WITHIN THE BUILDING
Ⓔ	TYPE F CURB PER FDOT STANDARD PLANS 520-001
Ⓕ	MIAMI DROP CURB PER CITY OF LARGO STANDARD DETAILS RT-130
Ⓖ	ADA PARKING PARKING STALL PER CITY OF LARGO STANDARD DETAILS RT-220
Ⓗ	TYPICAL DRIVEWAY PER CITY OF LARGO STANDARD DETAILS RT-270
Ⓘ	4' CURB TRANSITION PER CITY OF LARGO STANDARD DETAILS RT-270 (TYPICAL)
Ⓚ	PARALLEL PARKING SPACES PER CITY OF LARGO STANDARD DETAILS RT-210
Ⓛ	MATCH EXISTING CURB & GUTTER
Ⓜ	EXISTING TYPE "F" CURB
Ⓝ	BUS STOP RELOCATION
Ⓞ	TRANSFORMER
Ⓟ	STAIRS
Ⓠ	BIKE RACK

No.	REVISIONS	DATE

Kimley»Horn

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NICOLE E. BERLIN, P.E.
FLORIDA LICENSE NUMBER
92165
DATE:

SCALE AS SHOWN
DESIGNED BY NEB\BDD
DRAWN BY BDD
CHECKED BY JLI

SITE PLAN - BUILDING B

PMG LARGO MULTI-FAMILY MIXED USE

CITY OF LARGO
FLORIDA

DATE
3/22/2023
PROJECT NO.
043797004
SHEET NUMBER
C-401

Plotted By: Innhofer, Jessica Sheet Set: Largo PMG 043797 Layout: C-401 SITE PLAN — BUILDING B April 28, 2023 11:12:07am K:\stp_civil\043797 — pmg\004 — largo\CADD\plansheets\C-Site.dwg
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February 6, 2023

Ms. Alicia Parinello, AICP
Planning Division Manager
City of Largo
P.O. Box 296
Largo, Florida 33779

RE: ***West Bay Largo Mixed-Use Development***
Traffic Impact Analysis Methodology
City of Largo, Florida

Dear Ms. Parinello,

This letter summarizes the proposed Traffic Impact Analysis (TIA) study methodology for the proposed West Bay Largo Mixed-Use development located in the northwest (Building A) and northeast (Building B) quadrants of West Bay Drive & 6th Street Northwest. The project site is 2.57 acres and has an estimated buildout year of 2026. A location map and conceptual site plan for the development are attached for reference.

To appropriately address transportation impacts related to the proposed West Bay Largo Mixed-Use development, Kimley-Horn will conduct an analysis that follows the proposed methodology provided below for your review and comments.

As illustrated in the attached conceptual site plan, access to the site is proposed to be provided through the following access connections:

- One (1) full-access connection along 6th Street Northwest (Building A)
- One (1) full-access connection along 6th Street Northwest (Building B)
- One (1) full-access connection along 1st Avenue Northwest (Building A)

The proposed development will consist of the following land uses and densities:

- 276 multi-family housing units (low-rise)
- 27,300 sq ft. of retail use

TRIP GENERATION

Trip generation for the proposed development was calculated based on rates provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition for the land uses identified above. The trip generation potential of the proposed development was calculated using land use code (LUC) 220 (Multifamily Housing (Low-Rise) and 822 (Strip Retail Plaza (<40k)).

Modifications to the base trip generation estimates are sometimes applied due to internal capture and pass-by trips. Internal capture is the tendency for customers or residents to visit the retail, office, or residential sections of a site in one trip but be counted multiple times in the trip generation since the formulas assume developments are isolated. Pass-by trips are existing vehicles on the surrounding roadways which are attracted into the site by the presence of the development. Pass-by trips do not reduce the overall trip generation or driveway turning movement volumes but do reduce the number of new trips added to the roadway system. Internal capture and pass-by were utilized in this analysis. Pass-by and internal capture were calculated using the methodology provided in the *Institute of Transportation Engineers (ITE) Trip Generation Handbook, 3rd Edition: An ITE Proposed Recommended Practice*. Internal capture calculations and pass-by documentation are attached.

The proposed development is anticipated to generate 212 net new p.m. peak hour trips (124 entering/88 exiting). A table showing the p.m. peak-hour trip generation is attached.

Table 1: P.M. Peak-Hour Trip Generation

ITE TRIP GENERATION CHARACTERISTICS			**DIRECTIONAL DISTRIBUTION**		**GROSS TRIPS**			**INTERNAL CAPTURE**		**TOTAL EXTERNAL TRIPS**			**PASS-BY CAPTURE***		**NET NEW EXTERNAL TRIPS**		
		ITE	**Percent**						**IC**					**PB**			
Land Use	**Scale**	**Units**	**In**	**Out**	**In**	**Out**	**Total**	**Percent**	**Trips**	**In**	**Out**	**Total**	**Percent**	**Trips**	**In**	**Out**	**Total**
Multi-Family Housing (Low-Rise)	276	DU	63%	37%	88	51	139	20.9%	29	67	43	110	-	-	67	43	110
Strip Retail Plaza (<40k)	27.3	KSF	50%	50%	79	79	158	18.4%	29	71	58	129	17.1%	27	57	45	102
Total:					167	130	297	-	58	138	101	239	-	27	124	88	212

*Note: Pass-by trips assumed for this site do not exceed 10% of the adjacent street traffic

TRIP DISTRIBUTION

The distribution and assignment of project traffic will be performed using the Florida Standard Urban Transportation Model Structure (FSUTMS) transportation planning model outputs. The latest FDOT District Seven Regional Planning Model will be used to generate model distribution of project trips. The FSUTMS model output is attached for your approval.

STUDY AREA

The study area is proposed to consist of the project access driveways along the 6th Street Northwest and 1st Avenue Northwest roadway segments along with the following adjacent intersections:

- 1st Avenue Northwest & Ridge Road Northwest
- 1st Avenue Northwest & 6th Street Northwest
- 1st Avenue Northwest & 5th Street Northwest
- West Bay Drive & Clearwater Largo Road North
- West Bay Drive & 6th Street Northwest

In addition, the following roadway segments directly adjacent to the project site will be analyzed as well:

- 1st Avenue Northwest from Ridge Road Northwest to 5th Street Northwest
- West Bay Drive from Clearwater Largo Road North to 6th Street Northwest
- 6th Street Northwest from West Bay Drive to 1st Avenue Northwest

BACKGROUND GROWTH RATE

A growth rate was determined by using FDOT historical Annual Average Daily Traffic (AADT) information for three nearby roadway segments of State Road 686/East Bay Drive (East of US Alt 19), US Alt 19 (South of 4th Avenue Northwest), and Clearwater-Largo Road (North of West Bay Drive) was initially calculated as -2.49%, however a 1% growth rate will be used in order to provide a conservative analysis. Growth rate calculations are attached for reference.

TRAFFIC ANALYSIS

The study area roadway segments will be analyzed relative to the service volumes found in the Pinellas County 2022 Annual Level of Service Report (2021 data) as well as in the FDOT Generalized Peak Hour Two-Way Volumes for Florida's Urbanized Areas (2023). The roadway analysis will evaluate study roadway segments for the existing, background, and future total (year 2026 traffic conditions for the p.m. peak-hour.) The study intersections will be analyzed for future buildout conditions during the p.m. peak-hour.

TURN LANE ANALYSIS

Potential future left-turn and right-turn lane requirements will be evaluated (including needed sufficient storage length) with the addition of project traffic.

MULTI-MODAL ANALYSIS

A multi-modal analysis will be included in the report and will consider bicycle connectivity, transit routes, and pedestrian mobility. The analysis will demonstrate how the project will be connected to any existing pedestrian and bicycle facilities. A multi-modal map will be provided showing the existing sidewalks as well as any proposed sidewalks for this development.

DOCUMENTATION

The results of the traffic analysis will be summarized in a Traffic Impact Analysis (TIA) report. The report will contain supporting documents including turn lane warrants and intersection analyses software outputs. The report will also include text and graphics necessary to summarize the analysis and any assumptions made.

We will follow-up to see if you have any questions regarding this methodology.

Very truly yours,

KIMLEY-HORN AND ASSOCIATES, INC.

Christopher Hatton, P.E.
Principal

Omar Peerzada
Transportation Planning Analyst

Attachments:
Project Location Map
Conceptual Site Plan
Trip Generation
Internal Capture Calculations
FSUTMS Model Output
Growth Rate Calculations

Kimley»Horn

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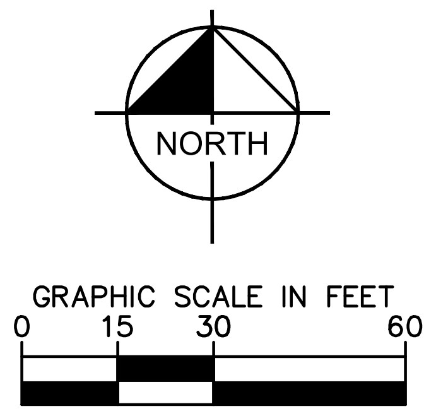
Project Location Map

WEST BAY LARGO MIXED-USE DEVELOPMENT
LARGO, FLORIDA

Project No: 043797004	Scale: As Noted	February 2023	Figure 1

SITE DATA TABLE

PROPOSED USE: MIXED USE PROFESSIONAL DEVELOPMENT			
LAND USE MAP DESIGNATION: WBD-CRD, MUC			
LOT AREA: 2.57 ACRES (112,015 SF)			
BUILDING AREA:	BUILDING FOOTPRINT (SF)	GFA (SF)	GFA WITH EXCLUSIONS (SF)
	88,471	XX	XX
		RETAIL - XX GENERAL COMMERCIAL - 000	
STANDARD	**EXISTING**	**PROPOSED**	**MIN./MAX. REQUIRED**
FLOOR AREA RATIO			
% FAR (TOTAL):	0.00%	0.00%	00
IMPERVIOUS SURFACE			
% ISR (TOTAL):	0.00%	0.00%	00
BUILDINGS:	00	2.03 AC (88,471 SF)	
PARKING, DRIVES, & SIDEWALKS:	0.00 AC (00000 SF)	0.00 AC (00000 SF)	
TOTAL PARKING SPACES:	00	0	SEPARATE TABLE PROVIDED
GENERAL: (PAVED)	0	0	
HANDICAPPED:	0	0	
SETBACKS:			
NORTH: 1ST AVENUE NW	0.00	20.00	20 FT. FROM BACK OF CURB
EAST: 5TH STREET NW	0.00	20.50	20 FT. FROM BACK OF CURB
WEST: RIDGE ROAD NW	0.00	20.00	20 FT. FROM BACK OF CURB
SOUTH: WEST BAY DRIVE	0.00	25.00	20 FT. FROM BACK OF CURB
NOTE(S): LANDSCAPE BUFFER REQUIREMENTS SUPERSEDE BUILDING SETBACKS			
FLOOD ZONE: ZONE "X" AREA OF MIN. FLOOD HAZARD			

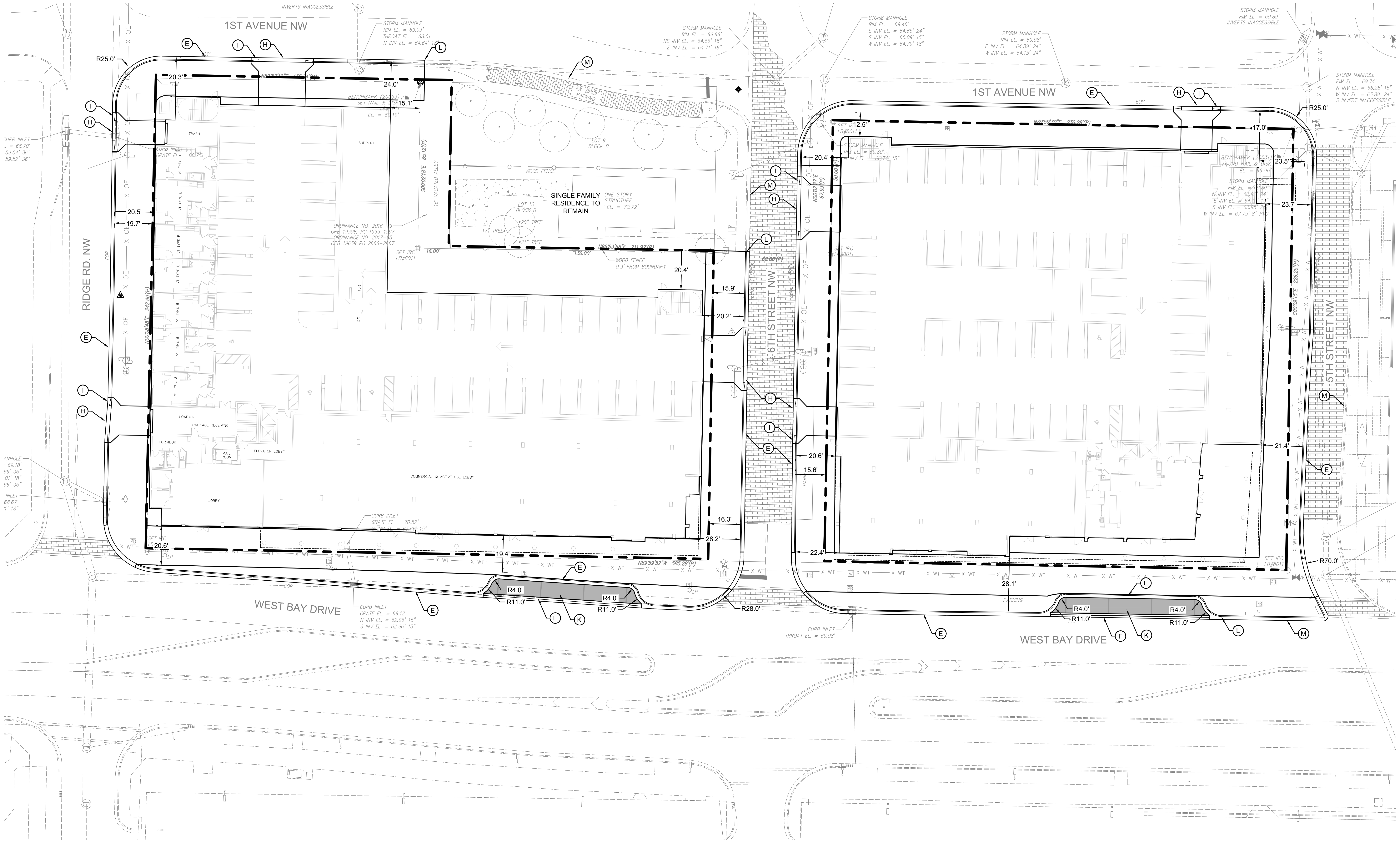


LEGEND

━ ━ · ━ ━	PROPERTY BOUNDARY
━━━━	PROPOSED TYPE "D" CURB
— — — —	LIMITS OF DISTURBANCE
— · — · —	BUILDING SETBACK LINE
Ⓧ	PARKING COUNT
┝●	PROPOSED SIGN
▨	STANDARD DUTY ASPHALTIC CONCRETE PAVEMENT
░	CONCRETE SIDEWALK

KEYNOTE LEGEND

Ⓐ	ASPHALT PAVEMENT
Ⓑ	SIDEWALK CURB RAMP WITH DETECTABLE WARNING PER CITY OF LARGO STANDARD DETAILS RT-150
Ⓒ	4" CONCRETE SIDEWALK PER CITY OF LARGO STANDARD DETAILS RT-140
Ⓓ	6" CONCRETE SIDEWALK PER CITY OF LARGO STANDARD DETAILS RT-140
Ⓔ	TYPE F CURB PER FDOT STANDARD PLANS 520-001
Ⓕ	MIAMI DROP CURB PER CITY OF LARGO STANDARD DETAILS RT-130
Ⓖ	ADA PARKING PARKING STALL PER CITY OF LARGO STANDARD DETAILS RT-220
Ⓗ	TYPICAL DRIVEWAY PER CITY OF LARGO STANDARD DETAILS RT-270
Ⓘ	4' CURB TRANSITION PER CITY OF LARGO STANDARD DETAILS RT-270 (TYPICAL)
Ⓚ	PARALLEL PARKING SPACES PER CITY OF LARGO STANDARD DETAILS RT-210
Ⓛ	MATCH EXISTING CURB & GUTTER
Ⓜ	EXISTING 2' CURB & GUTTER
Ⓝ	
Ⓞ	
Ⓟ	



KIMLEY-HORN

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PHONE: 727-547-3999 WWW.KIMLEY-HORN.COM
REGISTRY NO. 35106

No.
REVISIONS
DATE

LICENSED PROFESSIONAL
NICOLE E. BERLIN, P.E.
FLORIDA LICENSE NUMBER
92165
DATE:

SCALE
DESIGNED BY
DRAWN BY
CHECKED BY

#########

FLORIDA
XXXXXX COUNTY

DATE
PROJECT NO.
SHEET NUMBER
####

811
Know what's below.
Call before you dig.

Plotted By: Dahlen, Brian Sheet Set: ############ Layout: SITE PLAN January 10, 2023 10:26:06am K:\STP_Civil\043797 - PMG\004 - Largo\CADD\PlanSheets\C-Site.dwg
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PROJECT TRIP GENERATION COMPARISON

P.M. PEAK-HOUR OF ADJACENT STREET TRAFFIC

ITE TRIP GENERATION CHARACTERISTICS					DIRECTIONAL DISTRIBUTION		GROSS TRIPS			INTERNAL CAPTURE		TOTAL EXTERNAL TRIPS			PASS-BY CAPTURE		NET NEW EXTERNAL TRIPS		
					Percent														
Land Use	ITE Edition	ITE Code	Scale	ITE Units	In	Out	In	Out	Total	Percent	IC Trips	In	Out	Total	Percent	PB Trips	In	Out	Total
Multifamily Housing Low-Rise	11	220	276	DU	63%	37%	88	51	139	20.9%	29	67	43	110	0.0%	0	67	43	110
Strip Retail Plaza (<40k)	11	822	27.3	KSF	50%	50%	79	79	158	18.4%	29	71	58	129	17.1%	27	57	45	102
						Total:	167	130	297	19.5%	58	138	101	239	9.7%	27	124	88	212

Internal Capture Reduction Calculations

Methodology for A.M. Peak Hour and P.M. Peak Hour
based on the *Trip Generation Handbook* , 3rd Edition, published by the Institute of Transportation Engineers

Methodology for Daily
based on the average of the Unconstrained Rates for the A.M. Peak Hour and P.M. Peak Hour

SUMMARY (EXISTING)

GROSS TRIP GENERATION

INPUT

Land Use	Daily		A.M. Peak Hour		P.M. Peak Hour	
	Enter	Exit	Enter	Exit	Enter	Exit
Office						
Retail			34	22	79	79
Restaurant						
Cinema/Entertainment						
Residential			26	82	88	51
Hotel						
	0	0	60	104	167	130

INTERNAL TRIPS

OUTPUT

Land Use	Daily		A.M. Peak Hour		P.M. Peak Hour	
	Enter	Exit	Enter	Exit	Enter	Exit
Office	0	0	0	0	0	0
Retail	0	0	1	1	8	21
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	1	1	21	8
Hotel	0	0	0	0	0	0
	0	0	2	2	29	29

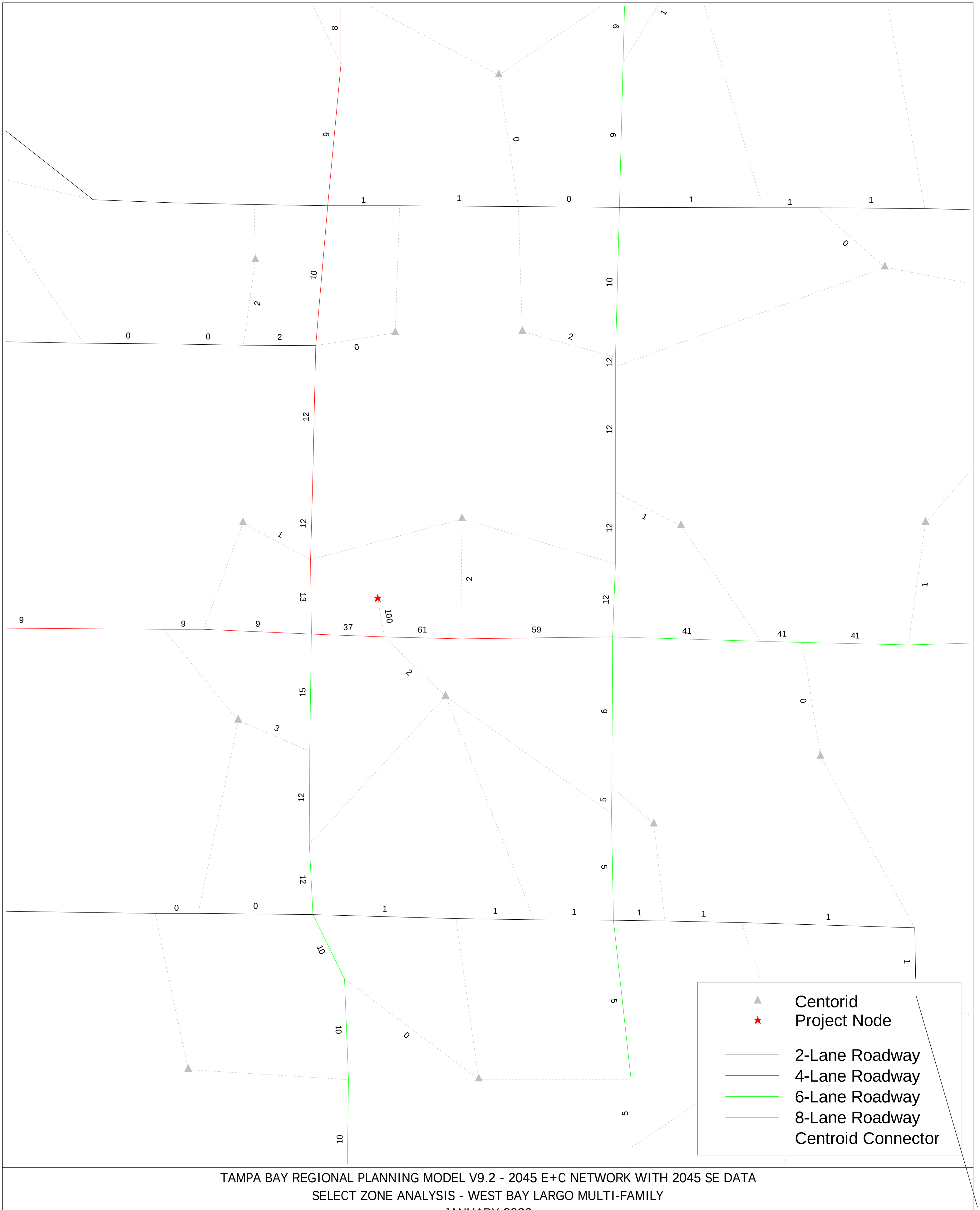
OUTPUT

Total % Reduction	*0.0%*	*2.4%*	*19.5%*
Office			
Retail		3.6%	18.4%
Restaurant			
Cinema/Entertainment			
Residential		1.9%	20.9%
Hotel			

EXTERNAL TRIPS

OUTPUT

Land Use	Daily		A.M. Peak Hour		P.M. Peak Hour	
	Enter	Exit	Enter	Exit	Enter	Exit
Office	0	0	0	0	0	0
Retail	0	0	33	21	71	58
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	25	81	67	43
Hotel	0	0	0	0	0	0
	0	0	58	102	138	101



TAMPA BAY REGIONAL PLANNING MODEL V9.2 - 2045 E+C NETWORK WITH 2045 SE DATA
SELECT ZONE ANALYSIS - WEST BAY LARGO MULTI-FAMILY
JANUARY 2023
C:\FSUTMS\D7\TBRPM_v9.2\BASE\Yr_2024_EC45\LargoMF\OUTPUT\HWYLOAD_DAILY_A24.NET

(Licensed to Kimley Horn and Associates Inc)

Project: Wesy Bay Largo Mixed-Use
Location: City of Largo, FL
Notes: FDOT Historical AADT

Volume Source #1: 5039 - SR 686/E BAY DR, E OF SR 595/SR 651/US
Volume Source #2: 0048 - SR 651/SR 595/ALT US 19/S MISSOURI AV
Volume Source #3: 9176 - CLEARWATER-LARGO RD, N OF WEST BAY
Volume Source #4:
Volume Source #5:

Line	Month	Year	Volume Source #1	Volume Source #2	Volume Source #3	Volume Source #4	Volume Source #5	Average Volume
1		2017	45000	33000	22000			33333.33333
2		2018	42000	33500	22000			32500
3		2019	42000	33500	17700			31066.66667
4		2020	42000	31000	16500			29833.33333
5		2021	43500	30000	18600			30700
6								
7								
8								
9								
10								

INPUT DATA

Line	Month	Year	Aggregate Traffic Volume
1		2017	33333.33333
2		2018	32500
3		2019	31066.66667
4		2020	29833.33333
5		2021	30700
6			
7			
8			
9			
10			

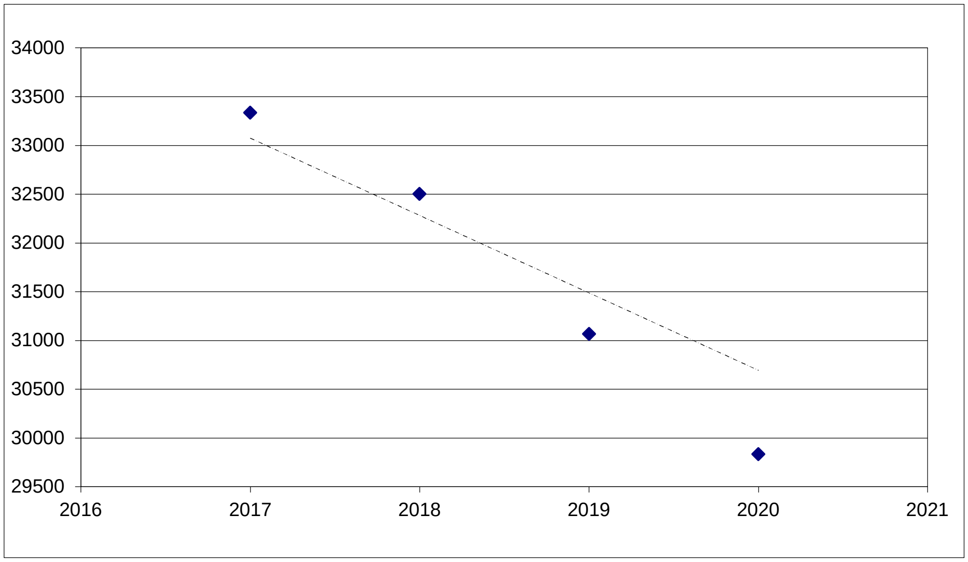
OUTPUT DATA

Line	Month	Year	Best Fit Volume Trend
1		2017	33073.33333
2		2018	32280
3		2019	31486.66667
4		2020	30693.33333
5		2021	29900
6			
7			
8			
9			
10			

Slope: -793.3333333
Intercept: 1633226.667
R^2: 0.790102103
Standard Error: 746.5476096

Exponential Growth Rate: -2.49%
Future = Existing (1+Growth)^N

Linear Growth Rate: -2.40%
Future = Existing (1+Growth*N)



FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2021 HISTORICAL AADT REPORT

COUNTY: 15 - PINELLAS

SITE: 0048 - SR 651/SR 595/ALT US 19/S MISSOURI AVE, S OF 4TH AVE NW

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2021	30000 C	N 15500	S 14500	9.00	53.00	2.40
2020	31000 C	N 15500	S 15500	9.00	55.30	3.20
2019	33500 F	N 17000	S 16500	9.00	55.70	3.20
2018	33500 C	N 17000	S 16500	9.00	55.50	3.20
2017	33000 F	N 17000	S 16000	9.00	54.50	3.00
2016	32000 C	N 16500	S 15500	9.00	55.90	3.00
2015	34000 C	N 17500	S 16500	9.00	55.00	3.40
2014	32000 C	N 16000	S 16000	9.00	55.40	3.60
2013	32000 C	N 15500	S 16500	9.00	55.20	3.70
2012	32000 C	N 16000	S 16000	9.00	55.00	2.40
2011	34000 C	N 17000	S 17000	9.00	56.50	2.40
2010	36000 C	N 18000	S 18000	10.52	55.26	2.50
2009	37000 C	N 18500	S 18500	10.53	55.79	2.40
2008	36000 C	N 18000	S 18000	10.29	58.46	2.80
2007	39500 F	N 20000	S 19500	10.31	56.79	3.20
2006	39500 C	N 20000	S 19500	9.88	58.53	3.20

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = 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

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2021 HISTORICAL AADT REPORT

COUNTY: 15 - PINELLAS

SITE: 5039 - SR 686/E BAY DR, E OF SR 595/SR 651/US ALT 19/SEMINOLE BLVD

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2021	43500 C	E 21500	W 22000	9.00	53.00	3.20
2020	42000 C	E 20500	W 21500	9.00	55.30	3.20
2019	42000 F	E 21000	W 21000	9.00	55.70	3.30
2018	42000 C	E 21000	W 21000	9.00	55.50	3.30
2017	45000 F	E 22000	W 23000	9.00	54.50	3.40
2016	44000 C	E 21500	W 22500	9.00	55.90	3.40
2015	44000 C	E 22000	W 22000	9.00	55.00	3.30
2014	44000 C	E 21500	W 22500	9.00	55.40	2.60
2013	45000 C	E 22000	W 23000	9.00	55.20	2.90
2012	43500 C	E 21000	W 22500	9.00	55.00	2.60
2011	43500 C	E 21000	W 22500	9.00	56.50	2.70
2010	45000 C	E 22000	W 23000	10.52	55.26	3.20
2009	44500 C	E 21500	W 23000	10.53	55.79	2.90
2008	43500 C	E 21000	W 22500	10.29	58.46	3.10
2007	47500 C	E 24500	W 23000	10.31	56.79	3.10
2006	45500 C	E 22500	W 23000	9.88	58.53	3.00

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = 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

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2021 HISTORICAL AADT REPORT

COUNTY: 15 - PINELLAS

SITE: 9176 - CLEARWATER-LARGO RD, N OF WEST BAY DR (HPMS)

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2021	18600 C	N 9200	S 9400	9.00	53.00	6.20
2020	16500 F	N 8200	S 8300	9.00	55.30	5.90
2019	17700 C	N 8800	S 8900	9.00	55.70	5.20
2018	22000 X	0	0	9.00	55.50	4.10
2017	22000 X	0	0	9.00	54.50	5.10
2016	21500 E	0	0	9.00	55.90	4.40
2015	21000 E	0	0	9.00	55.00	4.40
2014	20300 E			9.00	55.40	4.20
2013	20000 S	N 9500	S 10500	9.00	55.20	2.40
2012	20000 F	N 9500	S 10500	9.00	55.00	2.40
2011	20000 C	N 9500	S 10500	9.00	56.50	2.40

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = 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

APPENDIX B:
Internal Capture Calculations, and (FSUTMS) Model Output for District 7

Internal Capture Reduction Calculations

Methodology for A.M. Peak Hour and P.M. Peak Hour
based on the *Trip Generation Handbook* , 3rd Edition, published by the Institute of Transportation Engineers

Methodology for Daily
based on the average of the Unconstrained Rates for the A.M. Peak Hour and P.M. Peak Hour

SUMMARY (EXISTING)

GROSS TRIP GENERATION

INPUT

Land Use	Daily		A.M. Peak Hour		P.M. Peak Hour	
	Enter	Exit	Enter	Exit	Enter	Exit
Office						
Retail					79	79
Restaurant						
Cinema/Entertainment						
Residential					88	51
Hotel						
	0	0	0	0	167	130

INTERNAL TRIPS

OUTPUT

Land Use	Daily		A.M. Peak Hour		P.M. Peak Hour	
	Enter	Exit	Enter	Exit	Enter	Exit
Office	0	0	0	0	0	0
Retail	0	0	0	0	8	21
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	21	8
Hotel	0	0	0	0	0	0
	0	0	0	0	29	29

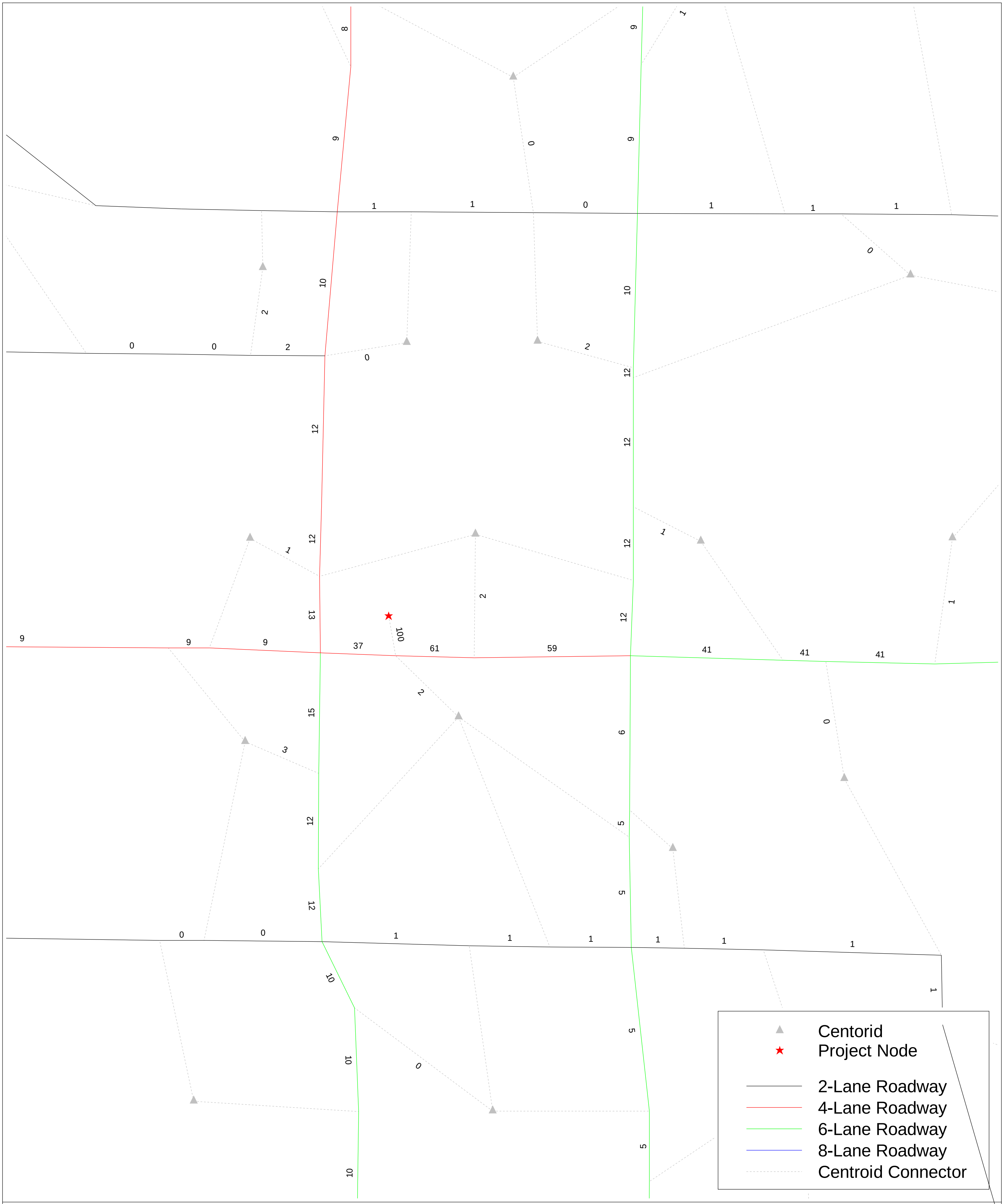
OUTPUT

Total % Reduction	***0.0%***	***0.0%***	***19.5%***
Office			
Retail			18.4%
Restaurant			
Cinema/Entertainment			
Residential			20.9%
Hotel			

EXTERNAL TRIPS

OUTPUT

Land Use	Daily		A.M. Peak Hour		P.M. Peak Hour	
	Enter	Exit	Enter	Exit	Enter	Exit
Office	0	0	0	0	0	0
Retail	0	0	0	0	71	58
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	67	43
Hotel	0	0	0	0	0	0
	0	0	0	0	138	101



TAMPA BAY REGIONAL PLANNING MODEL V9.2 - 2045 E+C NETWORK WITH 2045 SE DATA
SELECT ZONE ANALYSIS - WEST BAY LARGO MULTI-FAMILY
JANUARY 2023
C:\FSUTMS\D7\TBRPM_v9.2\BASE\Yr_2024_EC45\LargoMF\OUTPUT\HWYLOAD_DAILY_A24.NET

(Licensed to Kimley Horn and Associates Inc)

APPENDIX C:
2021 Turning Movement Counts, Largo City Hall Project Volumes, and Growth Rate Calculations

N/S Street: **4th St NW**

Speed: **30 MPH**

E/W Street: **West Bay Dr**

Speed: **35 MPH**

Site Code: **21-120338-002**

Date: **08/18/2021**

Weather: **Sunny**

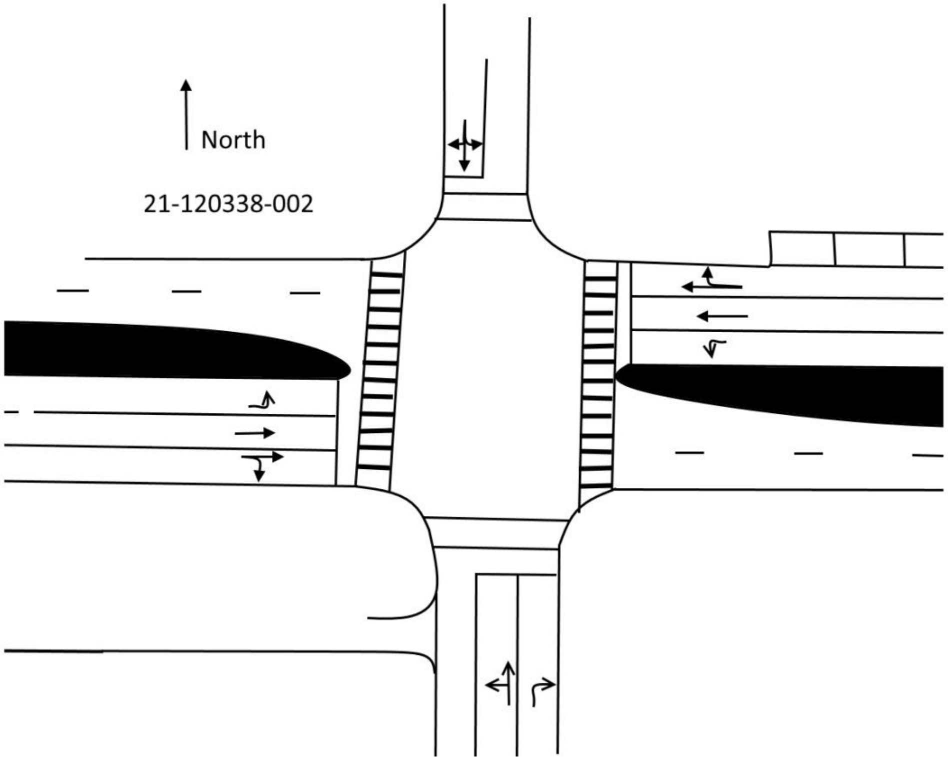
City: **Largo**

County: **Pinellas**

Count Times: **07:00 - 09:00**

16:00 - 18:00

Control: **Signalized**

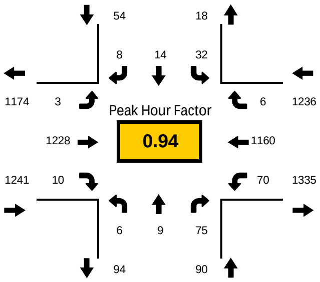


SIGNAL TIMING

PHASES	**1**	**2**	**3**
NT/ST	00:40	00:34	00:26
WL/WT	-	00:16	-
ET/WT	02:46	02:37	02:55

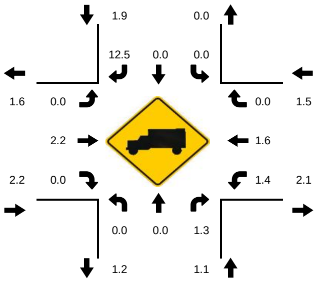
LOCATION: 4th St NW & West Bay Dr
CITY/STATE: Largo, FL

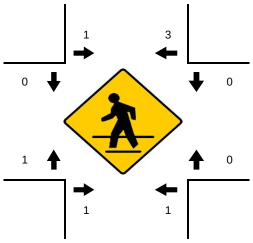
PROJECT ID: 21-120338-002
DATE: Wed, Aug 18, 2021

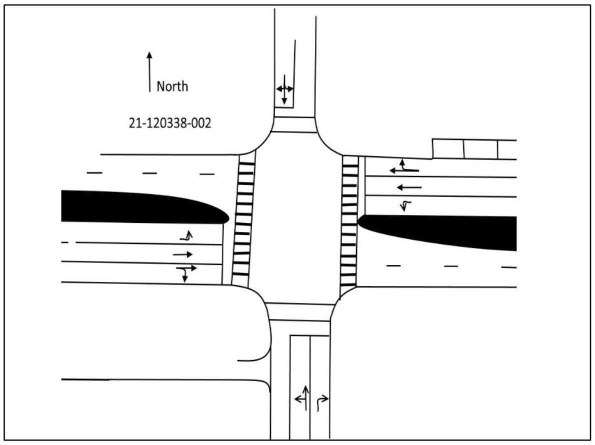


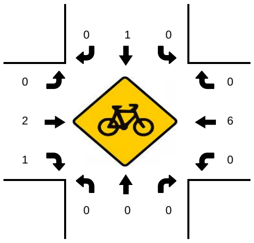
Peak-Hour: 04:15 PM - 05:15 PM
Peak 15-Minute: 04:15 PM - 04:30 PM

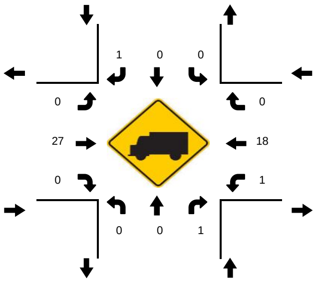
National Data & Surveying Services

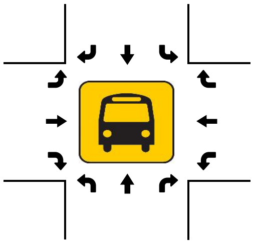












15-Min Count Period Beginning At	4th St NW Northbound					4th St NW Southbound					West Bay Dr Eastbound					West Bay Dr Westbound					Total	Hourly Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
04:00 PM	1	6	20	0		10	5	0	0		2	303	2	0		12	237	2	2		602	2581
04:15 PM	2	4	16	0		9	3	1	0		2	301	4	0		25	328	0	1		696	2621
04:30 PM	4	1	30	0		8	0	4	0		0	302	1	1		11	252	1	5		620	2560
04:45 PM	0	3	13	0		8	8	2	0		0	312	1	0		13	297	2	4		663	2544
05:00 PM	0	1	16	0		7	3	1	0		0	313	4	0		8	283	3	3		642	2475
05:15 PM	3	1	15	0		5	3	2	0		1	298	4	2		16	282	2	1		635	1833
05:30 PM	0	0	10	0		16	2	4	0		0	255	0	0		8	306	3	0		604	1198
05:45 PM	1	1	1	0		11	3	0	0		2	254	2	1		4	309	4	1		594	594

Peak 15-Min Flowrates	Northbound					Southbound					Eastbound					Westbound					Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	
All Vehicles	16	16	120	0		36	32	16	0		8	1252	16	4		100	1312	12	20		**2960**
Heavy Trucks	0	0	4	0		0	0	4	0		0	32	0	0		4	36	0	0		**80**
Pedestrians		4					8					4					0				**16**
Bicycles	0	0	0	0		0	4	0	0		0	4	4	0		0	12	0	0		**24**
Buses																					
Stopped Buses																					

National Data & Surveying Services

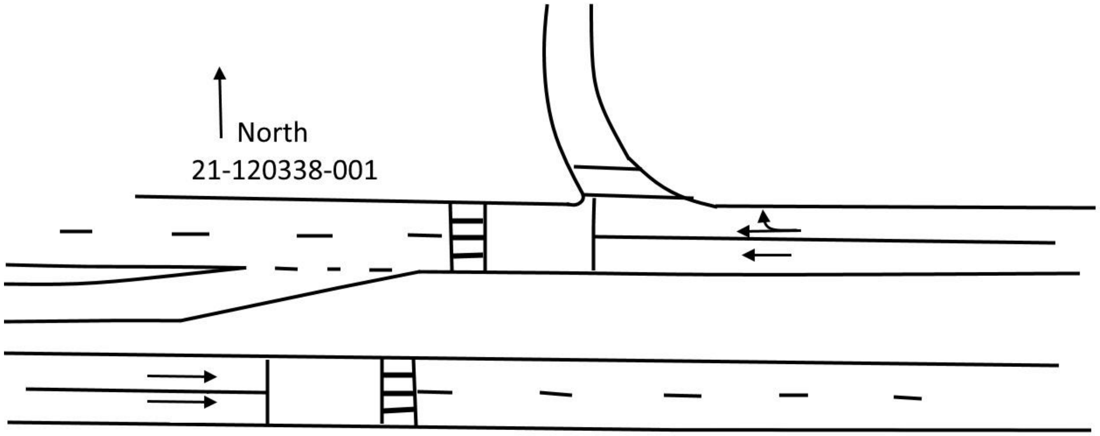
N/S Street: **5th St NW**

Speed: **N/A**

E/W Street: **West Bay Dr**

Speed: **35 MPH**

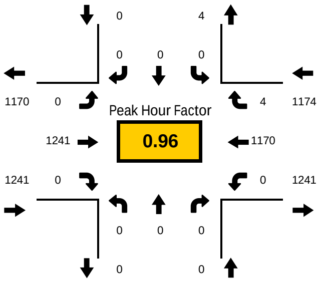
Site Code:	**21-120338-001**
Date:	**08/18/2021**
Weather:	**Sunny**
City:	**Largo**
County:	**Pinellas**
Count Times:	**07:00 - 09:00**
	16:00 - 18:00
Control:	**No Control**

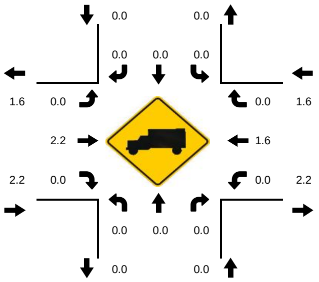


LOCATION: 5th St NW & West Bay Dr
CITY/STATE: Largo, FL

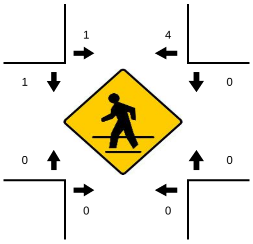
PROJECT ID: 21-120338-001
DATE: Wed, Aug 18, 2021

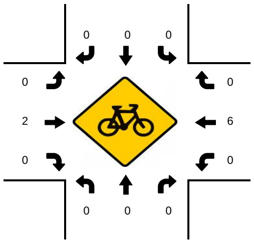
Peak-Hour: 04:15 PM - 05:15 PM
Peak 15-Minute: 05:00 PM - 05:15 PM

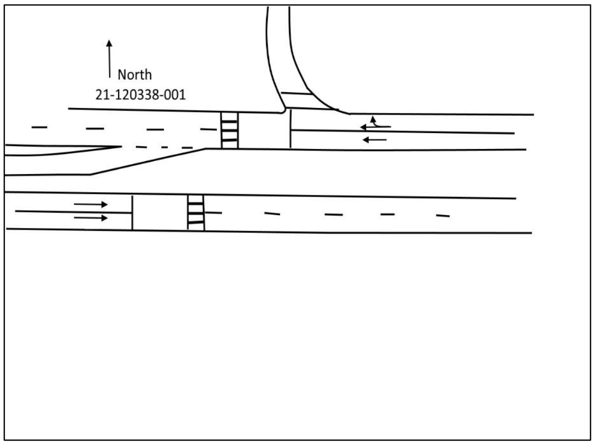


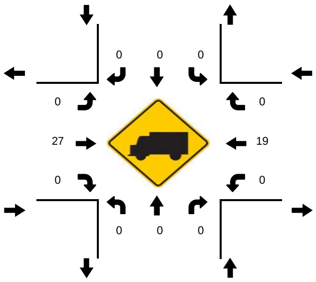


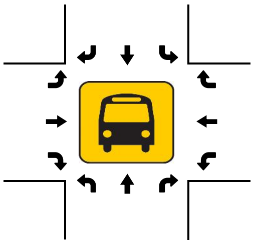
National Data & Surveying Services











15-Min Count Period Beginning At	5th St NW Northbound Left	Thru	Rgt	U	R*	5th St NW Southbound Left	Thru	Rgt	U	R*	West Bay Dr Eastbound Left	Thru	Rgt	U	R*	West Bay Dr Westbound Left	Thru	Rgt	U	R*	Total	Hourly Total
04:00 PM	0	0	0	0		0	0	0	0		0	325	0	0		0	241	1	0		567	2350
04:15 PM	0	0	0	0		0	0	0	0		0	304	0	0		0	314	2	0		620	2415
04:30 PM	0	0	0	0		0	0	0	0		0	308	0	0		0	275	0	0		583	2400
04:45 PM	0	0	0	0		0	0	0	0		0	300	0	0		0	280	0	0		580	2372
05:00 PM	0	0	0	0		0	0	0	0		0	329	0	0		0	301	2	0		632	2366
05:15 PM	0	0	0	0		0	0	0	0		0	317	0	0		0	287	1	0		605	1734
05:30 PM	0	0	0	0		0	0	0	0		0	244	0	0		0	308	3	0		555	1129
05:45 PM	0	0	0	0		0	0	0	0		0	265	0	0		0	307	2	0		574	574

Peak 15-Min Flowrates	Northbound Left	Thru	Rgt	U	R*	Southbound Left	Thru	Rgt	U	R*	Eastbound Left	Thru	Rgt	U	R*	Westbound Left	Thru	Rgt	U	R*	Total
All Vehicles	0	0	0	0		0	0	0	0		0	1316	0	0		0	1256	8	0		**2580**
Heavy Trucks	0	0	0	0		0	0	0	0		0	32	0	0		0	40	0	0		**72**
Pedestrians		0					8					4					0				**12**
Bicycles	0	0	0	0		0	0	0	0		0	4	0	0		0	16	0	0		**20**
Buses																					
Stopped Buses																					

Appendix C
P.M. Peak-Hour Project Traffic
City Hall
City of Largo, Florida

Kimley»Horn

© 2021

Project: Wesy Bay Largo Mixed-Use

Location: City of Largo, FL

Notes: FDOT Historical AADT

Volume Source #1: 5039 - SR 686/E BAY DR, E OF SR 595/SR 651/US ALT 19/SEMINOLE BLVD

Volume Source #2: 0048 - SR 651/SR 595/ALT US 19/S MISSOURI AVE, S OF 4TH AVE NW

Volume Source #3: 9176 - CLEARWATER-LARGO RD, N OF WEST BAY DR (HPMS)

Volume Source #4:

Volume Source #5:

Line	Month	Year	Volume Source #1	Volume Source #2	Volume Source #3	Volume Source #4	Volume Source #5	Average Volume
1		2017	45000	33000	22000			33333.33333
2		2018	42000	33500	22000			32500
3		2019	42000	33500	17700			31066.66667
4		2020	42000	31000	16500			29833.33333
5		2021	43500	30000	18600			30700
6								
7								
8								
9								
10								

INPUT DATA

Line	Month	Year	Aggregate Traffic Volume
1		2017	33333.33333
2		2018	32500
3		2019	31066.66667
4		2020	29833.33333
5		2021	30700

OUTPUT DATA

Line	Month	Year	Best Fit Volume Trend
1		2017	33073.33333
2		2018	32280
3		2019	31486.66667
4		2020	30693.33333
5		2021	29900

Slope: -793.3333333

Intercept: 1633226.667

R^2: 0.790102103

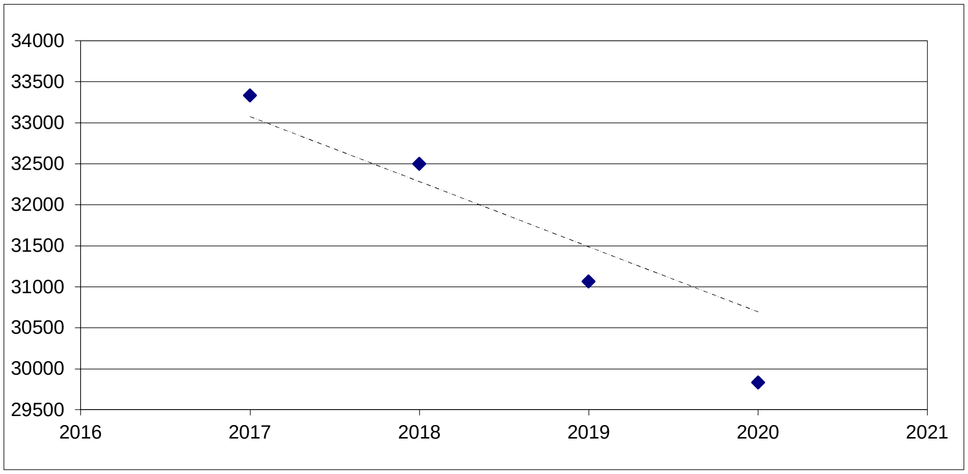
Standard Error: 746.5476096

Exponential Growth Rate: -2.49%

Future = Existing (1+Growth)^N

Linear Growth Rate: -2.40%

Future = Existing (1+Growth*N)



FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2021 HISTORICAL AADT REPORT

COUNTY: 15 - PINELLAS

SITE: 5039 - SR 686/E BAY DR, E OF SR 595/SR 651/US ALT 19/SEMINOLE BLVD

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2021	43500 C	E 21500	W 22000	9.00	53.00	3.20
2020	42000 C	E 20500	W 21500	9.00	55.30	3.20
2019	42000 F	E 21000	W 21000	9.00	55.70	3.30
2018	42000 C	E 21000	W 21000	9.00	55.50	3.30
2017	45000 F	E 22000	W 23000	9.00	54.50	3.40
2016	44000 C	E 21500	W 22500	9.00	55.90	3.40
2015	44000 C	E 22000	W 22000	9.00	55.00	3.30
2014	44000 C	E 21500	W 22500	9.00	55.40	2.60
2013	45000 C	E 22000	W 23000	9.00	55.20	2.90
2012	43500 C	E 21000	W 22500	9.00	55.00	2.60
2011	43500 C	E 21000	W 22500	9.00	56.50	2.70
2010	45000 C	E 22000	W 23000	10.52	55.26	3.20
2009	44500 C	E 21500	W 23000	10.53	55.79	2.90
2008	43500 C	E 21000	W 22500	10.29	58.46	3.10
2007	47500 C	E 24500	W 23000	10.31	56.79	3.10
2006	45500 C	E 22500	W 23000	9.88	58.53	3.00

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = 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

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2021 HISTORICAL AADT REPORT

COUNTY: 15 - PINELLAS

SITE: 0048 - SR 651/SR 595/ALT US 19/S MISSOURI AVE, S OF 4TH AVE NW

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2021	30000 C	N 15500	S 14500	9.00	53.00	2.40
2020	31000 C	N 15500	S 15500	9.00	55.30	3.20
2019	33500 F	N 17000	S 16500	9.00	55.70	3.20
2018	33500 C	N 17000	S 16500	9.00	55.50	3.20
2017	33000 F	N 17000	S 16000	9.00	54.50	3.00
2016	32000 C	N 16500	S 15500	9.00	55.90	3.00
2015	34000 C	N 17500	S 16500	9.00	55.00	3.40
2014	32000 C	N 16000	S 16000	9.00	55.40	3.60
2013	32000 C	N 15500	S 16500	9.00	55.20	3.70
2012	32000 C	N 16000	S 16000	9.00	55.00	2.40
2011	34000 C	N 17000	S 17000	9.00	56.50	2.40
2010	36000 C	N 18000	S 18000	10.52	55.26	2.50
2009	37000 C	N 18500	S 18500	10.53	55.79	2.40
2008	36000 C	N 18000	S 18000	10.29	58.46	2.80
2007	39500 F	N 20000	S 19500	10.31	56.79	3.20
2006	39500 C	N 20000	S 19500	9.88	58.53	3.20

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = 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

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2021 HISTORICAL AADT REPORT

COUNTY: 15 - PINELLAS

SITE: 9176 - CLEARWATER-LARGO RD, N OF WEST BAY DR (HPMS)

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2021	18600 C	N 9200	S 9400	9.00	53.00	6.20
2020	16500 F	N 8200	S 8300	9.00	55.30	5.90
2019	17700 C	N 8800	S 8900	9.00	55.70	5.20
2018	22000 X	0	0	9.00	55.50	4.10
2017	22000 X	0	0	9.00	54.50	5.10
2016	21500 E	0	0	9.00	55.90	4.40
2015	21000 E	0	0	9.00	55.00	4.40
2014	20300 E			9.00	55.40	4.20
2013	20000 S	N 9500	S 10500	9.00	55.20	2.40
2012	20000 F	N 9500	S 10500	9.00	55.00	2.40
2011	20000 C	N 9500	S 10500	9.00	56.50	2.40

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = 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

APPENDIX D:
2022 Annual Level of Service Report for Forward Pinellas, and FDOT’s Generalized LOS Volume Tables

FORWARD PINELLAS
Integrating Land Use & Transportation

2022 Annual Level of Service Report

2021 Data Year

Facility Level of Service Report (Pinellas County Format)
(Peak Hour Directional)

Forward Pinellas

Notes: Roadways included in this Inventory are Arterials and Collectors. Level of Service (LOS) has been calculated using the guidelines of the FDOT Quality Level of Service, FDOT Generalized Tables, FDOT Art Plan, and Highway Capacity Manual (HCM). The LOS Input values shown on this report do not fully represent values maintained and generated by the vTIMAS database, please do not attempt to use these values to reproduce LOS results. A more complete listing of LOS input values and assumptions is available, if needed please request a copy of the LOS Inventory Staff Report. Only LOS grades on state roads are utilizing FDOT's 2012 generalized tables. All other measures utilize 2009 generalized tables.

FACILITY	FACILITY_TYPE	CURRENTYEAR	Road_Type	JURIS	LOS_STANDARD	LENGTH_MILES	SIGNALS_PER_MILE	LOS_METHOD	AADT	VOLUME	PHYSICAL_CAPACITY	VOL_CAP_RATIO	DEF_FLAG	FACILITY_LOS
3 - 1ST AVE N: (3RD ST N -to- 20TH ST N)	SA	2021	3O	SP	D	1.421	7.178	T	11500	1092	2776	0.393	0	D
4 - 1ST AVE N: (20TH ST N -to- 34TH ST N)	SA	2021	3O	SP	D	1.172	5.812	T	11500	1092	3056	0.357	0	D
5 - 1ST AVE N: (34TH ST N -to- 66TH ST N)	SA	2021	3O	SP	D	2.999	1.539	T	12000	1140	3175	0.359	0	C
9 - 1ST AVE S: (PASADENA AVE -to- 34TH ST S)	SA	2021	3O	SP	D	3.247	2.084	T	11000	1045	3175	0.329	0	C
10 - 1ST AVE S: (34TH ST S -to- 16TH ST S)	SA	2021	3O	SP	D	1.505	3.769	T	10392	987	3056	0.323	0	C
11 - 1ST AVE S: (16TH ST S -to- DR ML KING JR ST S)	SA	2021	4O	SP	D	0.501	1.998	T	10392	987	4082	0.242	0	C
12 - 1ST AVE S: (DR ML KING JR ST S -to- 3RD ST S)	SA	2021	3O	SP	D	0.587	9.224	T	10392	987	2776	0.356	0	C
30 - 3RD ST N: (CENTRAL AVE -to- 5TH AVE N)	SA	2021	4O	SR	D	0.438	11.854	T	10500	997	3900	0.256	0	C
37 - 4TH AVE N: (I-375 RAMP -to- 4TH ST N)	SA	2021	3O	SR	D	0.213	9.415	T	12000	1140	2988	0.382	0	C
43 - 4TH ST N: (5TH AVE N -to- 30TH AVE N)	SA	2021	4D	SR	D	1.506	3.895	T	27100	1358	1870	0.726	0	D
44 - 4TH ST N: (30TH AVE N -to- 38TH AVE N)	SA	2021	6D	SR	D	0.501	3.995	T	31500	1645	2830	0.581	0	D
45 - 4TH ST N: (I-275 -to- GANDY BLVD)	SA	2021	4D	SR	D	2.552	0.392	T	11900	621	1960	0.317	0	C
46 - 4TH ST N: (GANDY BLVD -to- 62ND AVE N)	SA	2021	6D	SR	D	1.795	7.17	T	31666	1593	2830	0.563	0	C
47 - 4TH ST N: (62ND AVE N -to- 38TH AVE N)	SA	2021	6D	SR	D	1.5	1.503	T	37500	1959	2940	0.666	0	C
48 - 4TH ST N: (5TH AVE N -to- 2ND AVE N)	SA	2021	4O	SR	D	0.279	10.815	T	12666	1187	3900	0.304	0	C
50 - 4TH ST N: (2ND AVE N -to- 1ST AVE N)	SA	2021	3O	SR	D	0.099	10.06	T	13000	1235	2988	0.413	0	D
51 - 4TH ST N: (1ST AVE N -to- CENTRAL AVE)	SA	2021	4O	SR	D	0.06	16.611	T	13000	1235	3900	0.317	0	C
53 - 4TH ST S: (CENTRAL AVE -to- 4TH AVE S)	SA	2021	4O	SR	D	0.279	14.961	T	13000	1235	3900	0.317	0	C
54 - 4TH ST S: (4TH AVE S -to- 6TH AVE S)	SA	2021	3U	SP	D	0.198	10.119	T	14197	679	1577	0.431	0	D
55 - 4TH ST S: (6TH AVE S -to- 9TH AVE S)	SA	2021	4D	SP	D	0.21	4.753	T	15395	804	1530	0.525	0	D
56 - 4TH ST S: (9TH AVE S -to- 18TH AVE S)	NA	2021	4D	SP	D	0.626	0	T	15395	804	3760	0.214	0	D
57 - 4TH ST S | 6TH ST CONNECTION: (18TH AVE S -to- 39TH AVE S)	SA	2021	4U	SP	D	1.306	1.581	T	15421	804	1676	0.48	0	D
58 - 4TH ST S | 6TH ST CONNECTION: (39TH AVE S -to- 45TH AVE S)	NA	2021	4U	SP	D	0.41	0	T	15500	809	3572	0.226	0	D
61 - 5TH AVE N: (4TH ST N -to- DR MLK JR ST N)	SA	2021	2O	SR	D	0.5	5.292	T	9300	532	2244	0.237	0	C
63 - 5TH AVE N: (DR ML KING JR ST -to- 16TH ST N)	SA	2021	3U	SR	D	0.502	1.159	T	10200	475	1776	0.267	0	D
65 - 5TH AVE N: (16TH ST N -to- 34TH ST N)	SA	2021	4D	SR	D	1.503	5.84	T	23333	1191	1870	0.637	0	C
66 - 5TH AVE N: (34TH ST N -to- 49TH ST N)	SA	2021	4D	SR	D	1.252	2.503	T	23500	1227	1960	0.626	0	C
67 - 5TH AVE N: (49TH ST N -to- TYRONE BLVD)	SA	2021	4D	SR	D	0.878	4.829	T	32000	1672	1870	0.894	0	C
68 - 5TH AVE N: (TYRONE BLVD -to- 66TH ST N)	SA	2021	4D	SP	D	0.869	1.151	T	32000	1672	1764	0.948	0	C
69 - 5TH AVE N: (66TH ST N -to- 69TH ST N)	SMC	2021	4D	SP	D	0.347	2.884	T	9934	519	1216	0.427	0	C
70 - 5TH AVE N: (69TH ST N -to- PARK ST)	NMC	2021	4D	SP	D	0.709	0	T	9934	519	3760	0.138	0	C
84 - 8TH ST N: (CENTRAL AVE -to- 1ST AVE N)	SA	2021	4O	SP	D	0.062	16.234	T	7954	755	3726	0.203	0	C
85 - 8TH ST N: (1ST AVE N -to- 9TH AVE N)	SA	2021	3O	SP	D	0.641	8.633	T	7954	755	2776	0.272	0	C
86 - 8TH ST S: (9TH AVE S -to- 6TH AVE S)	SA	2021	3O	SP	D	0.215	4.651	T	7954	755	3056	0.247	0	C
87 - 8TH ST S: (6TH AVE S -to- CENTRAL AVE)	SA	2021	4O	SP	D	0.478	13.347	T	7954	755	3726	0.203	0	C

520 - BRYAN DAIRY RD/118TH AVE N: (28TH ST N -to- 34TH ST N)	SA	2021	4D	CR	D	0.5	4.005	T	10500	548	1683	0.326	0	C
521 - BRYAN DAIRY RD/118TH AVE N: (US 19 -to- BELCHER RD)	SA	2021	6D	CR	D	2.15	0.43	T	40875	1724	2646	0.652	0	C
522 - BRYAN DAIRY RD | 118TH AVE N: (34TH ST N -to- 40TH ST N)	NA	2021	4D	CR	D	0.493	0	T	33000	1724	3760	0.459	0	D
523 - BRYAN DAIRY RD | 118TH AVE N: (40TH ST N -to- 49TH ST N)	SA	2021	6D	CR	D	0.764	1.139	T	39000	2037	2646	0.77	0	C
526 - CENTRAL AVE: (34TH ST N -to- 58TH ST N)	SA	2021	4D	CR	D	2.009	2.669	T	12000	627	1683	0.373	0	C
527 - CENTRAL AVE: (58TH ST N -to- PARK ST)	SA	2021	4D	CR	D	1.763	3.148	T	14666	627	1683	0.373	0	C
528 - CENTRAL AVE: (34TH ST N -to- 31ST ST N)	SA	2021	4D	SP	D	0.252	8.41	T	9100	475	1454	0.327	0	C
529 - CENTRAL AVE: (31ST ST N -to- 3RD ST N)	SA	2021	2U	SP	D	2.341	5.987	T	7420	365	774	0.472	0	D
533 - CHESTNUT ST: (COURT ST CONNECTION -to- FT HARRISON AVE)	SA	2021	2O	SR	D	0.205	9.785	T	19500	1852	1992	0.93	0	F
534 - CHESTNUT ST: (FT HARRISON AVE -to- MYRTLE AVE)	SA	2021	4O	SR	D	0.252	3.97	T	19500	1852	4536	0.408	0	D
538 - CLEARWATER-LARGO RD: (BELLEAIR RD -to- W BAY DR)	SA	2021	4D	LA	D	1.556	2.857	T	19358	597	1683	0.355	0	C
539 - CLEARWATER-LARGO RD: (W BAY DR -to- ULMERTON RD)	SA	2021	6D	CR	D	1.529	2.076	T	22000	1149	2646	0.434	0	D
542 - CLEVELAND ST: (MYRTLE AVE -to- MISSOURI AVE)	SA	2021	2D	CL	D	0.505	3.962	T	4500	235	813	0.289	0	C
543 - CLEVELAND ST: (MISSOURI AVE -to- GULF-TO-BAY BLVD)	SA	2021	4D	CL	D	0.465	2.151	T	2789	145	1683	0.086	0	C
549 - COMMERCE BLVD: (TAMPA RD -to- DOUGLAS RD)	NMC	2021	2U	OLD	D	0.182	0	T	5939	310	1440	0.215	0	C
555 - COREY CSWY/75TH AVE: (GULF BLVD -to- SHORE DR)	SA	2021	4D	SR	D	1.043	6.095	T	24800	1123	1615	0.695	0	D
556 - CORONADO DR: (ROUNDABOUT -to- HAMDEN DR)	SA	2021	2D	CL	D	0.647	11.36	T	6032	315	774	0.407	0	C
558 - COUNTRYSIDE BLVD: (BELCHER RD -to- US 19)	SA	2021	4D	CL	D	0.526	4.616	T	20239	1057	1683	0.628	0	C
559 - COUNTRYSIDE BLVD: (US 19 -to- SR 580)	SA	2021	6D	CL	D	0.785	3.082	T	20239	1057	2547	0.415	0	C
560 - COUNTRYSIDE BLVD: (SR 580 -to- N SIDE DR)	NA	2021	4D	CL	D	1.387	0	T	9854	514	3760	0.137	0	C
561 - COUNTRYSIDE BLVD: (N SIDE DR -to- CURLEW RD)	SA	2021	2U	CL	D	0.875	1.142	T	9854	514	792	0.649	0	D
562 - COUNTRYSIDE BLVD: (CURLEW RD -to- LAKE ST GEORGE DR)	SC	2021	2U	CR	D	0.354	2.823	T	4125	215	559	0.385	0	C
564 - COURT ST: (MISSOURI AVE -to- HIGHLAND AVE)	SA	2021	4D	SR	D	0.755	2.982	T	40500	2116	1870	1.132	0	F
565 - COURT ST: (FT HARRISON AVE -to- OAK AVE)	SA	2021	3O	SR	D	0.105	9.533	T	18000	1710	2988	0.572	0	D
566 - COURT ST: (OAK AVE -to- CHESTNUT ST CONNECTION)	NA	2021	2O	SR	D	0.041	0	T	18000	1710	4512	0.379	0	F
568 - COURTNEY CAMPBELL CSWY: (HILLSBOROUGH CL -to- BAYSHORE BLVD)	SA	2021	4D	SR	D	3.554	1.313	T	58000	3030	1960	1.546	0	F
569 - CR 1: (SR 580 -to- CURLEW RD)	SA	2021	4D	CR	D	2.032	2.145	T	19591	1023	1764	0.58	0	D
570 - CR 1 | OMAHA ST: (CURLEW RD -to- TAMPA RD)	SA	2021	4D	CR	D	1.397	0.6	T	12217	638	1764	0.362	0	C
571 - CR 1 | OMAHA ST: (TAMPA RD -to- NEBRASKA AVE)	SA	2021	2D	CR	D	0.751	1.002	T	9458	350	832	0.421	0	D
572 - CR 1 | OMAHA ST: (NEBRASKA AVE -to- ALDERMAN RD)	SA	2021	2D	CR	D	1.005	2.334	T	6700	350	832	0.421	0	D
574 - CR 296 CONNECTOR: (GATEWAY EXPRESS -to- I-275)	NA	2021	4G	SR	D	0.985	0	T	44265	2312	3760	0.615	0	F
580 - CR 611 BYPASS: (SOUTH SPLIT -to- NORTH SPLIT)	NA	2021	4D	CR	D	0.888	0	T	38013	1986	3760	0.528	0	F
589 - CURLEW RD: (SR 584 | TAMPA RD -to- MCMULLEN BOOTH RD)	SA	2021	6D	SR	D	0.939	4.112	T	18900	987	2830	0.349	0	C
590 - CURLEW RD: (MCMULLEN BOOTH RD -to- US 19)	SA	2021	6D	SR	D	1.805	2.678	T	33833	1750	2940	0.595	0	C
591 - CURLEW RD: (US 19 -to- CR 1 | OMAHA ST)	SA	2021	4D	SR	D	1.283	1.612	T	26250	1280	1960	0.653	0	C
592 - CURLEW RD: (CR 1 | OMAHA ST -to- ALT 19)	SA	2021	2D	SR	D	1.282	0.78	T	14700	768	924	0.831	0	E
602 - DIXIE HWY: (ALT US 19 -to- BECKETT WAY)	NC	2021	2U	CR	D	0.561	0	T	4164	217	1440	0.151	0	C
603 - DIXIE HWY: (BECKETT WAY -to- PASCO CO LINE)	NC	2021	2U	CR	D	0.398	0	T	4164	217	1440	0.151	0	C
607 - DOUGLAS AVE: (STEVENSONS CREEK -to- SUNSET POINT RD)	SMC	2021	4U	CL	D	0.482	4.673	T	3039	158	1155	0.137	0	C
608 - DOUGLAS AVE: (SUNSET POINT RD -to- UNION ST)	NMC	2021	4U	CR	D	0.509	0	T	3039	158	3572	0.044	0	C
609 - DOUGLAS AVE: (UNION ST -to- BELTREES ST)	SMC	2021	2D	DN	D	0.506	1.861	T	3039	158	601	0.263	0	C
610 - DOUGLAS AVE: (BELTREES ST -to- MAIN ST)	SMC	2021	2U	DN	D	0.478	2.09	T	3436	179	559	0.32	0	C
611 - DOUGLAS AVE: (MAIN ST -to- SKINNER BLVD)	NMC	2021	2U	DN	D	0.282	0	T	3436	179	1440	0.124	0	C
613 - DOUGLAS RD: (COMMERCE BLVD -to- RACE TRACK RD)	SMC	2021	2U	OLD	D	0.962	1.04	T	5939	310	572	0.542	0	C
614 - DR MARTIN LUTHER KING JR ST N: (9TH AVE N -to- CENTRAL AVE)	SA	2021	4O	SP	D	0.69	13.833	T	11500	1092	3726	0.293	0	C
615 - DR MARTIN LUTHER KING JR ST N: (9TH AVE N -to- 22ND AVE N)	SA	2021	3D	SP	D	0.753	0.727	T	14750	600	1676	0.358	0	C
616 - DR MARTIN LUTHER KING JR ST N: (I-275 -to- GANDY BLVD)	SA	2021	4D	CR	D	2.108	2.518	T	16000	757	1764	0.429	0	C
617 - DR MARTIN LUTHER KING JR ST N: (22ND AVE N -to- 38TH AVE N)	SA	2021	3D	SP	D	1.022	3.231	T	15200	794	1683	0.472	0	D
618 - DR MARTIN LUTHER KING JR ST N: (GANDY BLVD -to- 62ND AVE N)	SA	2021	4D	SP	D	2.312	3.564	T	17500	914	1683	0.543	0	C
619 - DR MARTIN LUTHER KING JR ST N: (62ND AVE N -to- 38TH AVE N)	SA	2021	4D	SP	D	1.482	1.51	T	16350	794	1764	0.45	0	D
621 - DR MLK JR ST S: (CENTRAL AVE -to- 8TH ST S)	SA	2021	4O	SP	D	0.656	12.259	T	13214	1092	3726	0.293	0	C
622 - DR MARTIN LUTHER KING JR ST S: (8TH ST S -to- 26TH AVE S)	SA	2021	4D	SP	D	1.153	3.311	T	17500	914	1683	0.543	0	D
623 - DR MARTIN LUTHER KING JR ST S: (26TH AVE S -to- 45TH AVE S)	NA	2021	4D	SP	D	1.283	0	T	15500	705	3572	0.197	0	C
624 - DR MARTIN LUTHER KING JR ST S: (45TH AVE S -to- 62ND AVE S)	SA	2021	4U	SP	D	1.02	4.615	T	13500	705	1599	0.441	0	C
627 - DREW ST: (MCMULLEN BOOTH RD -to- US 19)	SA	2021	4D	CL	D	1.283	3.221	T	19000	992	1683	0.589	0	D
628 - DREW ST: (FT HARRISON AVE -to- MISSOURI AVE)	SA	2021	4U	CL	D	0.754	3.981	T	9784	206	1776	0.116	0	C
629 - DREW ST: (US 19 -to- NE COACHMAN RD)	SA	2021	4D	CR	D	1.405	2.589	T	26160	1017	1683	0.604	0	C
630 - DREW ST: (MISSOURI AVE -to- HIGHLAND AVE)	SA	2021	4U	SR	D	0.756	3.014	T	18111	946	1776	0.533	0	C
631 - DREW ST: (HIGHLAND AVE -to- N SATURN AVE)	SA	2021	4U	SR	D	0.634	1.306	T	25000	1306	1862	0.701	0	C
632 - DREW ST: (N SATURN AVE -to- NE COACHMAN RD)	SA	2021	4D	SR	D	0.738	7.156	T	23160	1017	1870	0.544	0	C
636 - DRUID RD: (US 19 -to- BELCHER RD)	SMC	2021	2D	CL	D	1.009	0.991	T	6809	355	601	0.591	0	C
637 - DRUID RD: (BELCHER RD -to- KEENE RD)	SMC	2021	2U	CL	D	1.007	1.987	T	6809	355	572	0.621	0	D
638 - DRUID RD: (KEENE RD -to- HIGHLAND AVE ')	SMC	2021	2U	CL	D	0.774	2.938	T	6809	355	559	0.635	0	D
641 - DUHME RD | 113TH ST: (WELCH CSWY -to- PARK BLVD)	SA	2021	6D	CR	D	2.219	2.908	T	16750	705	2646	0.266	0	C
642 - DUHME RD | 113TH ST: (PARK BLVD -to- 86TH AVE N)	SA	2021	6D	CR	D	0.614	6.001	T	20000	1045	2547	0.41	0	C
643 - DUHME RD | 113TH ST: (86TH AVE N -to- 102ND AVE N)	SA	2021	4D	CR	D	1.016	1.986	T	21000	1097	1764	0.622	0	C

1095 - US 19: (GANDY BLVD to MAINLANDS BLVD)	SA	2021	6D	SR	D	1.243	2.638	T	72000	3762	2940	1.28	0	F
1096 - US 19: (MAINLANDS BLVD to BRYAN DAIRY RD/118TH AVE N)	NA	2021	6P	SR	D	1.968	0	T	73000	3579	5650	0.633	0	F
1097 - US 19: (BRYAN DAIRY RD | 118TH AVE N to E BAY DR)	NA	2021	6P	SR	D	2.85	0	T	81833	4101	5650	0.726	0	F
1098 - US 19: (E BAY DR to GULF TO BAY BLVD)	NA	2021	6P	SR	D	3.047	0	T	102142	4754	5650	0.841	0	F
1099 - US 19: (GULF TO BAY BLVD to SUNSET POINT RD)	NA	2021	6P	SR	D	2.086	0	T	105000	5172	5650	0.915	0	F
1100 - US 19: (SUNSET POINT RD to SR 580 | MAIN ST)	NA	2021	6P	SR	D	2.103	0	T	111000	4963	5650	0.878	0	F
1101 - US 19: (SR 580 | MAIN ST to CURLEW RD)	SA	2021	6D	SR	D	2.034	0.89	T	95000	4963	2940	1.688	0	F
1102 - US 19: (CURLEW RD to TAMPA RD)	SA	2021	6D	SR	D	1.253	0.666	T	80000	4180	2940	1.422	0	F
1103 - US 19: (TAMPA RD to ALDERMAN RD)	SA	2021	6D	SR	D	1.818	0.819	T	85500	4467	2940	1.519	0	F
1104 - US 19: (ALDERMAN RD to KLOSTERMAN RD)	SA	2021	6D	SR	D	2.025	0.999	T	77000	4023	2940	1.368	0	F
1105 - US 19: (KLOSTERMAN RD to TARPON AVE)	SA	2021	6D	SR	D	1.602	1.886	T	81000	4232	2940	1.439	0	F
1106 - US 19: (TARPON AVE to BECKETT WAY)	SA	2021	6D	SR	D	1.417	1.125	T	69500	3631	2940	1.235	0	F
1107 - US 19: (BECKETT WAY to PASCO CNTY LINE)	SA	2021	6D	SR	D	0.438	2.281	T	69500	3631	2830	1.283	0	F
1108 - US 19 | 34TH ST N: (38TH AVE N to 22ND AVE N)	SA	2021	6D	SR	D	1.009	1.982	T	41500	2168	2940	0.737	0	C
1109 - US 19/34TH ST N: (CENTRAL AVE to 5TH AVE N)	SA	2021	6D	SR	D	0.435	9.64	T	41000	2142	2570	0.833	0	D
1110 - US 19 | 34TH ST N: (5TH AVE N to 22ND AVE N)	SA	2021	6D	SR	D	1.003	3.33	T	41500	2168	2830	0.766	0	D
1112 - US 19/34TH ST S: (54TH AVE S to 22ND AVE S)	SA	2021	6D	SR	D	2.015	3.448	T	25583	1332	2830	0.471	0	C
1113 - US 19/34TH ST S: (22ND AVE S to CENTRAL AVE)	SA	2021	6D	SR	D	1.559	5.628	T	26000	1358	2830	0.48	0	D
1117 - VIRGINIA AVE S: (HERCULES AVE to KEENE RD	SC	2021	2U	CR	D	0.5	2.002	T	1009	52	559	0.093	0	C
1118 - VIRGINIA ST: (HIGHLAND AVE to KEENE RD)	SMC	2021	2U	CR	D	1.392	1.45	T	7824	408	572	0.713	0	D
1119 - VIRGINIA ST: (KEENE RD to SR 580	SMC	2021	2D	DN	D	0.577	1.735	T	7829	409	601	0.681	0	D
1120 - VONN RD: (130TH AVE/WILCOX RD to WALSINGHAM RD)	SC	2021	2U	CR	D	0.75	1.333	T	6092	318	572	0.556	0	C
1122 - VONN RD: (PARK BLVD to WALSINGHAM RD)	SMC	2021	2U	CR	D	2.524	1.321	T	9100	475	572	0.83	0	D
1126 - WALSINGHAM RD: (ALT 19/SEMINOLE BLVD to 113TH ST N)	SC	2021	2U	CR	D	0.501	1.996	T	12156	635	559	1.136	0	D
1127 - WALSINGHAM RD: (113TH ST N to ULMERTON RD)	SMC	2021	2U	CR	D	1.24	3.7	T	12156	635	572	1.11	0	D
1129 - WEST BAY DR: (MISSOURI AVE to CLWTR LARGO RD)	SA	2021	4D	LA	D	0.536	3.736	T	43500	2272	1683	1.35	0	F
1130 - WEST BAY DR: (CLWTR LARGO RD to INDIAN ROCKS RD)	SA	2021	4D	CR	D	1.266	4.16	T	18682	976	1683	0.58	0	D
1138 - WILCOX RD/130TH AVE: (ULMERTON RD to INDIAN ROCKS RD)	NC	2021	2U	CR	D	1.385	0	T	3500	182	1440	0.126	0	C

TABLE 4

Generalized **Peak Hour Two-Way** Volumes for Florida's Urbanized Areas[1]

January 2020

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	1,510	1,600	**
4	Divided	*	3,420	3,580	**
6	Divided	*	5,250	5,390	**
8	Divided	*	7,090	7,210	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	660	1,330	1,410
4	Divided	*	1,310	2,920	3,040
6	Divided	*	2,090	4,500	4,590
8	Divided	*	2,880	6,060	6,130

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes
by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional
volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	260	680	1,770
50-84%	190	600	1,770	>1,770
85-100%	830	1,700	>1,770	**

PEDESTRIAN MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	250	850
50-84%	*	150	780	1,420
85-100%	340	960	1,560	>1,770

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Core Urbanized

Lanes	B	C	D	E
4	4,050	5,640	6,800	7,420
6	5,960	8,310	10,220	11,150
8	7,840	10,960	13,620	14,850
10	9,800	13,510	17,040	18,580
12	11,600	16,350	20,930	23,200

Urbanized

Lanes	B	C	D	E
4	4,130	5,640	7,070	7,690
6	6,200	8,450	10,510	11,530
8	8,270	11,270	13,960	15,380
10	10,350	14,110	17,310	19,220

Freeway Adjustments

Auxiliary Lanes Present in Both Directions	Ramp Metering
+ 1,800	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	1,050	1,620	2,180	2,930
4	Divided	3,270	4,730	5,960	6,780
6	Divided	4,910	7,090	8,950	10,180

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1] Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Implementation Office
https://www.fdot.gov/planning/systems/

APPENDIX E:
2023 Turning Movements Counts, and Peak-Season Conversion Factors (PSCF)

NDS
National Data & Surveying Services

N/S Street: **Seminole Blvd/Missouri Ave N**

Speed: **40 MPH**

E/W Street: **W Bay Dr**

Speed: **30 MPH**

Site Code: **23-120159-004**

Date: **04/12/2023**

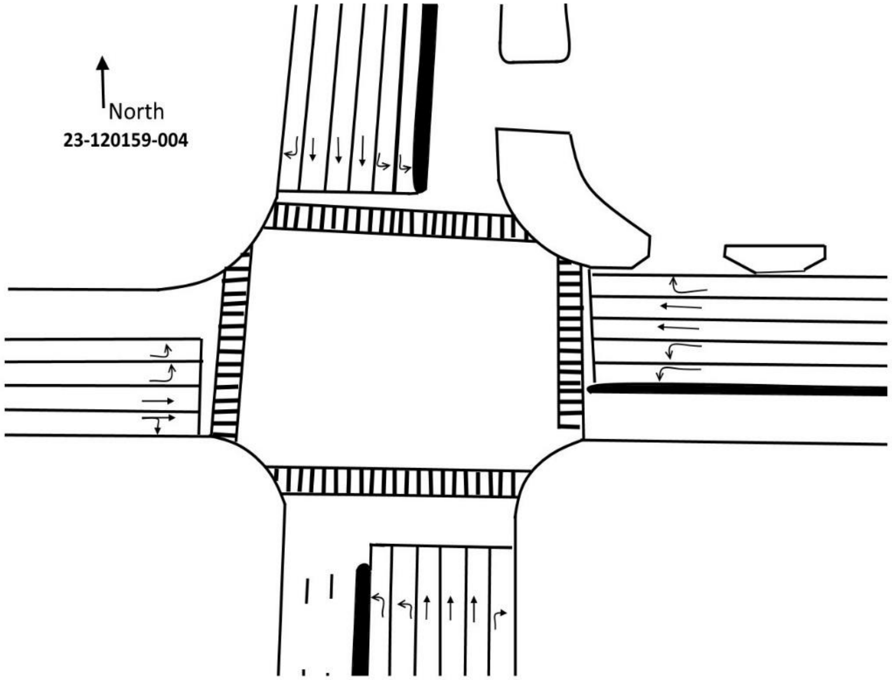
Weather: **Sunny**

City: **Largo**

County: **Pinellas**

Count Times: **16:00 - 18:00**

Control: **Signalized**



SIGNAL TIMING

PHASES	1	2	3
NL/NT	00:29	00:28	00:26
NT/ST	00:19	00:19	00:22
SL/ST	00:22	00:22	00:22
EL/ET	00:25	00:22	00:25
ET/WT	01:19	01:23	01:18
WL/WT	00:30	00:29	00:32

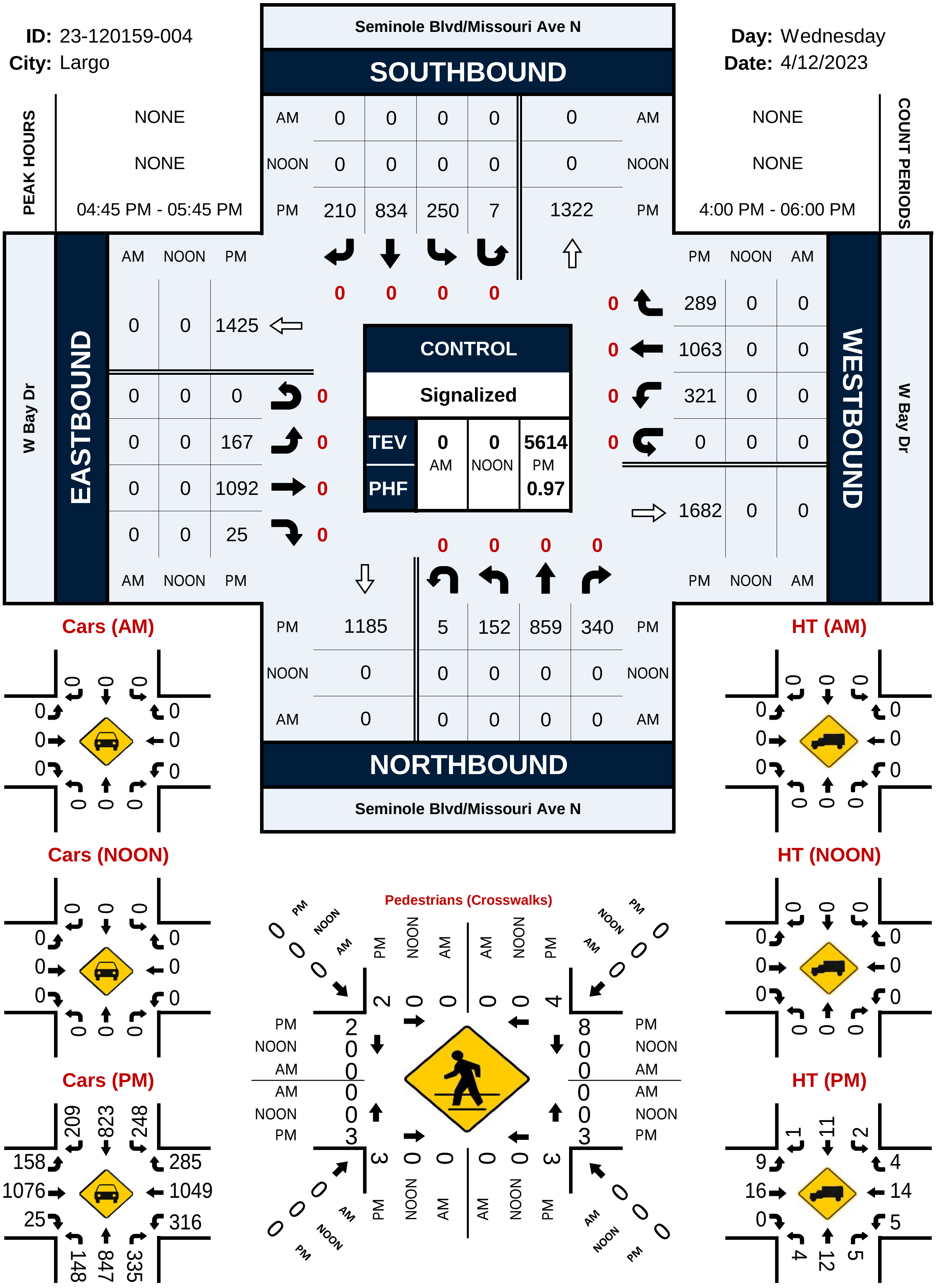
Prepared by National Data & Surveying Services

Seminole Blvd/Missouri Ave N & W Bay Dr

Peak Hour Turning Movement Count

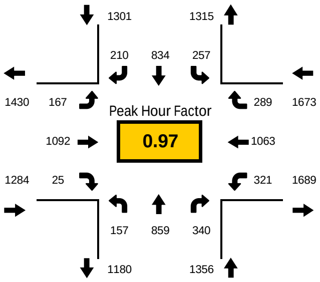
ID: 23-120159-004
City: Largo

Day: Wednesday
Date: 4/12/2023



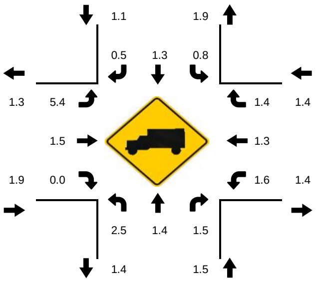
LOCATION: Seminole Blvd/Missouri Ave N & W Bay Dr
CITY/STATE: Largo, FL

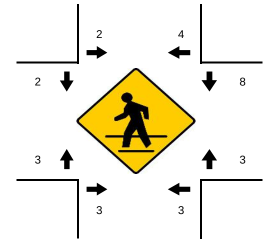
PROJECT ID: 23-120159-004
DATE: Wed, Apr 12, 2023

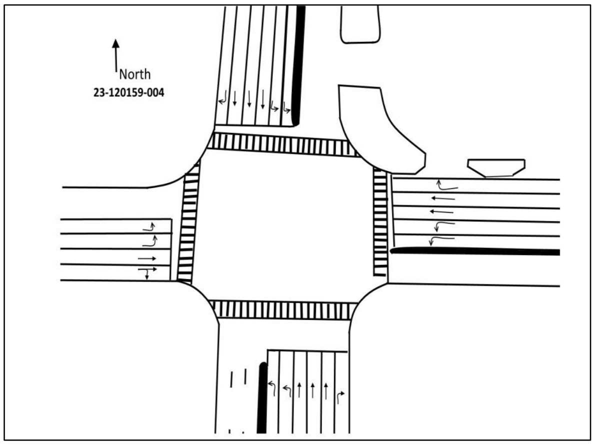


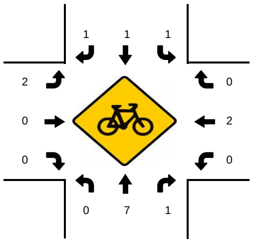
Peak-Hour: 04:45 PM - 05:45 PM
Peak 15-Minute: 05:00 PM - 05:15 PM

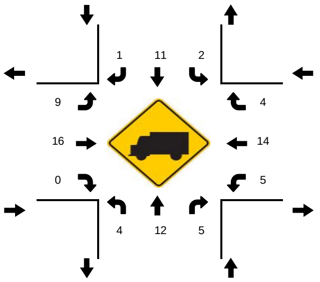
National Data & Surveying Services

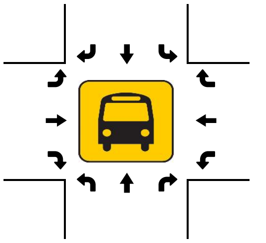












15-Min Count Period Beginning At	Seminole Blvd/Missouri Ave N Northbound					Seminole Blvd/Missouri Ave N Southbound					W Bay Dr Eastbound					W Bay Dr Westbound						Hourly
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Total	Total
4:00 PM	27	174	59	0		54	144	55	5		36	312	2	0		98	294	69	0		1329	5480
4:15 PM	50	236	106	2		75	199	57	6		26	231	3	0		95	252	78	0		1416	5598
4:30 PM	34	205	78	0		65	192	35	1		33	352	6	0		59	270	62	0		1392	5605
4:45 PM	35	227	91	2		59	157	48	4		41	250	4	0		91	264	70	0		1343	5614
5:00 PM	31	214	86	1		69	212	60	1		40	302	4	0		67	281	79	0		1447	5492
5:15 PM	45	202	86	0		59	197	41	0		35	289	11	0		94	289	75	0		1423	4045
5:30 PM	41	216	77	2		63	268	61	2		51	251	6	0		69	229	65	0		1401	2622
5:45 PM	34	161	72	0		50	125	41	3		38	265	3	0		86	283	60	0		1221	1221
Peak 15-Min Flowrates	Northbound					Southbound					Eastbound					Westbound						
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Total	
All Vehicles	180	908	364	8		276	1072	244	16		204	1208	44	0		376	1156	316	0		**6372**	
Heavy Trucks	8	12	8	0		4	16	4	0		12	24	0	0		16	24	8	0		**136**	
Pedestrians		8					12					8					32				**60**	
Bicycles	0	16	4	0		4	4	4	0		4	0	0	0		0	8	0	0		**44**	
Buses																						
Stopped Buses																						

National Data & Surveying Services

N/S Street: **4th St NW/SW**

Speed: **30 MPH**

E/W Street: **W Bay Dr**

Speed: **30 MPH**

Site Code: **23-120159-002**

Date: **04/12/2023**

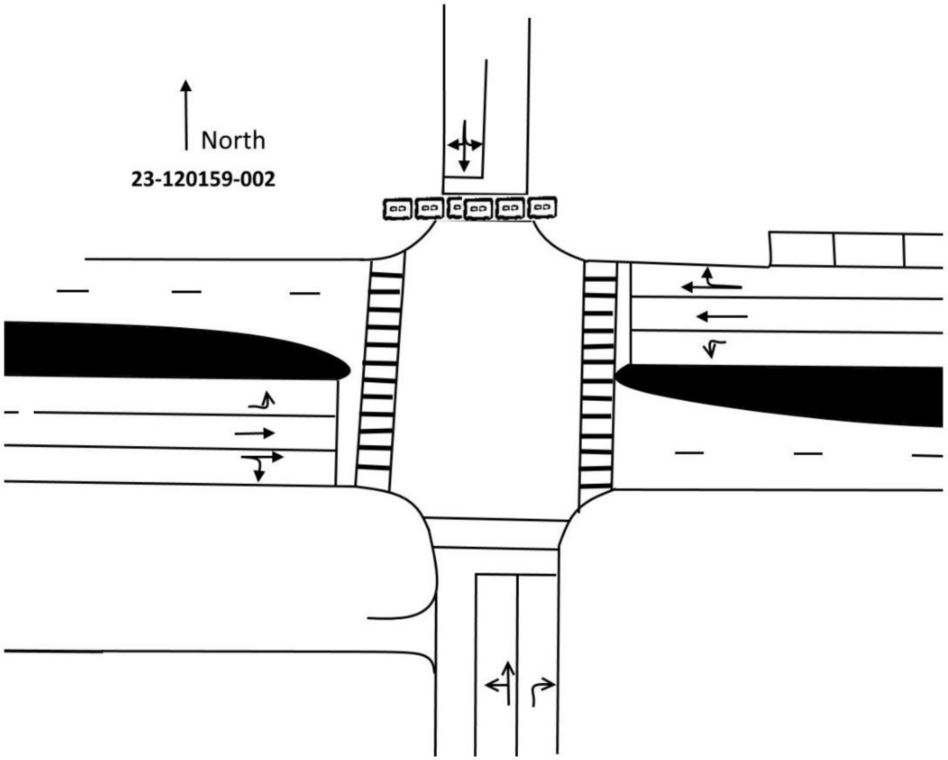
Weather: **Sunny**

City: **Largo**

County: **Pinellas**

Count Times: **16:00 - 18:00**

Control: **Signalized**



SIGNAL TIMING

PHASES	**1**	**2**	**3**
NL	00:29	00:29	00:21
ET/WT	02:54	06:21	03:18

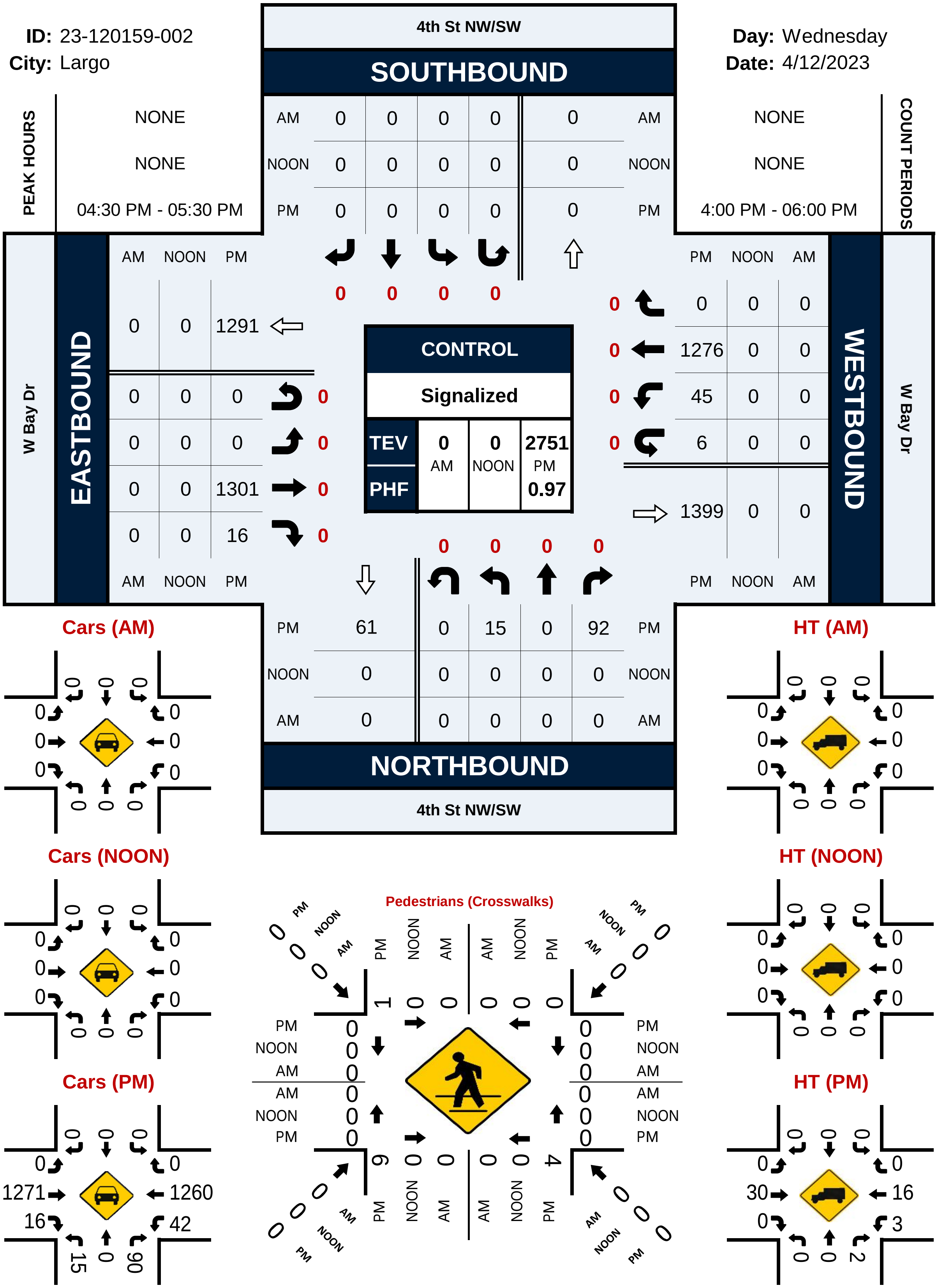
Prepared by National Data & Surveying Services

4th St NW/SW & W Bay Dr

Peak Hour Turning Movement Count

ID: 23-120159-002
City: Largo

Day: Wednesday
Date: 4/12/2023



PEAK HOURS		COUNT PERIODS
AM	NONE	NONE
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	4:00 PM - 06:00 PM

4th St NW/SW — SOUTHBOUND

	↲	↓	↳	⮌	⇧
AM	0	0	0	0	0
NOON	0	0	0	0	0
PM	0	0	0	0	0
	0	0	0	0	

W Bay Dr — EASTBOUND

	AM	NOON	PM	
⇦	0	0	1291	
⮌	0	0	0	0
↱	0	0	0	0
→	0	0	1301	0
↴	0	0	16	0

W Bay Dr — WESTBOUND

		PM	NOON	AM
0	↱	0	0	0
0	←	1276	0	0
0	↰	45	0	0
0	⮌	6	0	0
	⇨	1399	0	0

4th St NW/SW — NORTHBOUND

	⇩	⮌	↰	↑	↱
		0	0	0	0
PM	61	0	15	0	92
NOON	0	0	0	0	0
AM	0	0	0	0	0

CONTROL

Signalized

	AM	NOON	PM
TEV	0	0	2751
PHF			0.97

Cars (AM) / **Cars (NOON)** / **Cars (PM)** / **HT (AM)** / **HT (NOON)** / **HT (PM)**

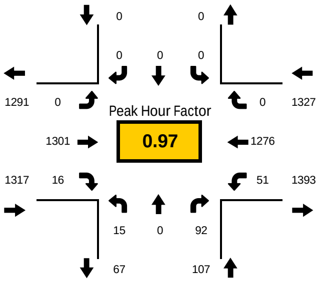
	Cars (AM)	Cars (NOON)	Cars (PM)	HT (AM)	HT (NOON)	HT (PM)
SB ↲	0	0	0	0	0	0
SB ↓	0	0	0	0	0	0
SB ↳	0	0	0	0	0	0
EB ↱	0	0	0	0	0	0
EB →	0	0	1271	0	0	30
EB ↴	0	0	16	0	0	0
WB ↱	0	0	0	0	0	0
WB ←	0	0	1260	0	0	16
WB ↰	0	0	42	0	0	3
NB ↰	0	0	15	0	0	0
NB ↑	0	0	0	0	0	0
NB ↱	0	0	90	0	0	2

Pedestrians (Crosswalks)

	PM	NOON	AM
NW corner	0	0	0
North crosswalk →	1	0	0
North crosswalk ←	0	0	0
NE corner	0	0	0
West crosswalk ↓	0	0	0
West crosswalk ↑	0	0	0
East crosswalk ↓	0	0	0
East crosswalk ↑	0	0	0
SW corner	0	0	0
South crosswalk →	6	0	0
South crosswalk ←	4	0	0
SE corner	0	0	0

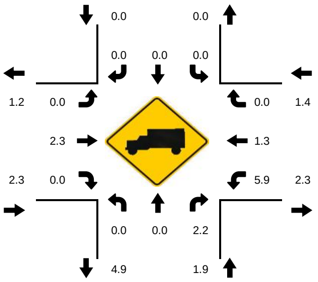
LOCATION: 4th St NW/SW & W Bay Dr
CITY/STATE: Largo, FL

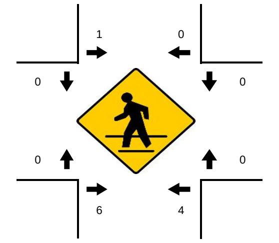
PROJECT ID: 23-120159-002
DATE: Wed, Apr 12, 2023

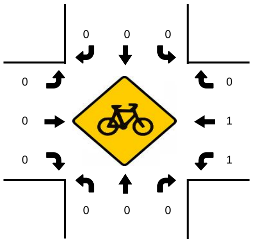


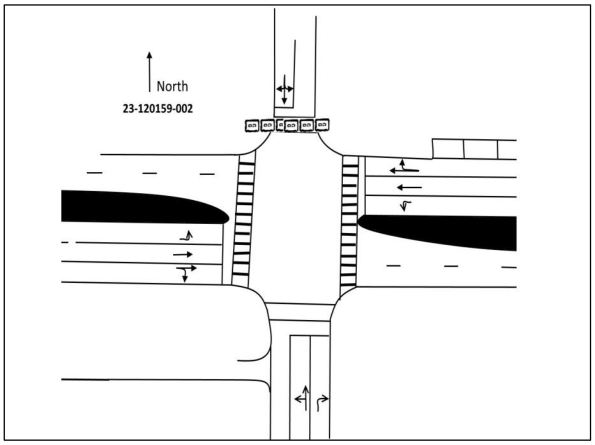
Peak-Hour: 04:30 PM - 05:30 PM
Peak 15-Minute: 05:00 PM - 05:15 PM

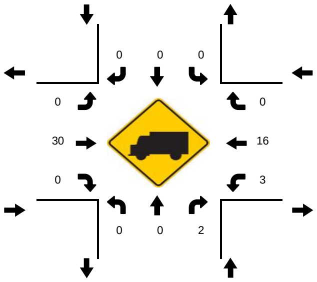
National Data & Surveying Services

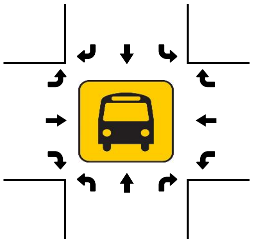












15-Min Count Period Beginning At	4th St NW/SW Northbound					4th St NW/SW Southbound					W Bay Dr Eastbound					W Bay Dr Westbound					Total	Hourly Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
4:00 PM	6	0	24	0		0	0	0	0		0	340	4	0		8	327	0	0		709	2723
4:15 PM	1	0	11	0		0	0	0	0		0	299	3	0		20	326	0	5		665	2720
4:30 PM	1	0	42	0		0	0	0	0		0	341	3	0		13	290	0	0		690	2751
4:45 PM	6	0	24	0		0	0	0	0		0	294	4	0		14	316	0	1		659	2707
5:00 PM	5	0	12	0		0	0	0	0		0	337	5	0		9	335	0	3		706	2638
5:15 PM	3	0	14	0		0	0	0	0		0	329	4	0		9	335	0	2		696	1932
5:30 PM	1	0	11	0		0	0	0	0		0	325	3	0		9	296	0	1		646	1236
5:45 PM	0	0	4	0		0	0	0	0		0	292	2	0		11	279	0	2		590	590
Peak 15-Min Flowrates	Northbound					Southbound					Eastbound					Westbound					Total	
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
All Vehicles	24	0	168	0		0	0	0	0		0	1364	20	0		56	1340	0	12		**2984**	
Heavy Trucks	0	0	4	0		0	0	0	0		0	36	0	0		8	24	0	0		**72**	
Pedestrians		24					4					0					0				**28**	
Bicycles	0	0	0	0		0	0	0	0		0	0	0	0		4	4	0	0		**8**	
Buses																						
Stopped Buses																						

National Data & Surveying Services

N/S Street: **5th St NW/SW**

Speed: **N/A**

E/W Street: **W Bay Dr**

Speed: **30 MPH**

Site Code: **23-120159-001**

Date: **04/12/2023**

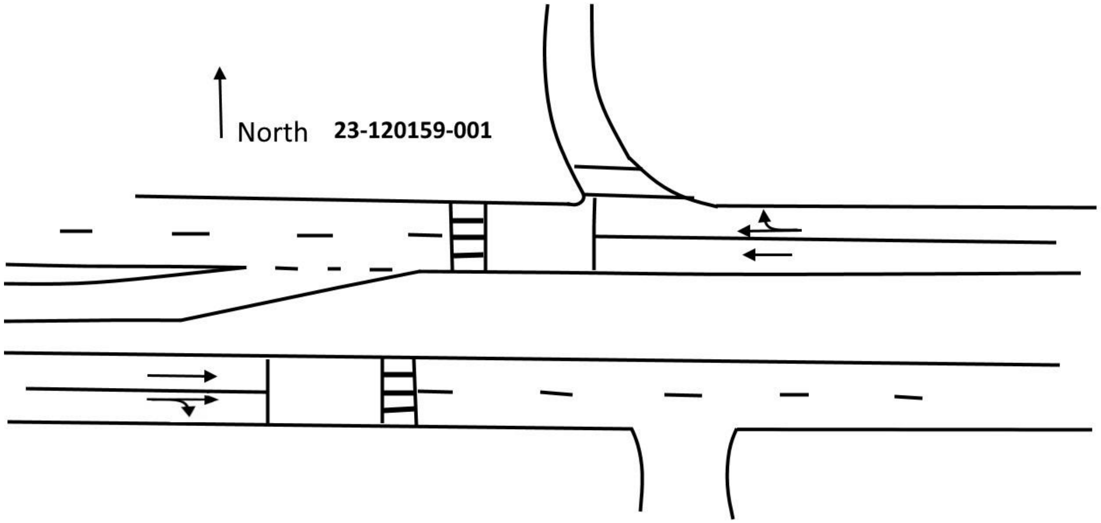
Weather: **Sunny**

City: **Largo**

County: **Pinellas**

Count Times: **16:00 - 18:00**

Control: **No Control**



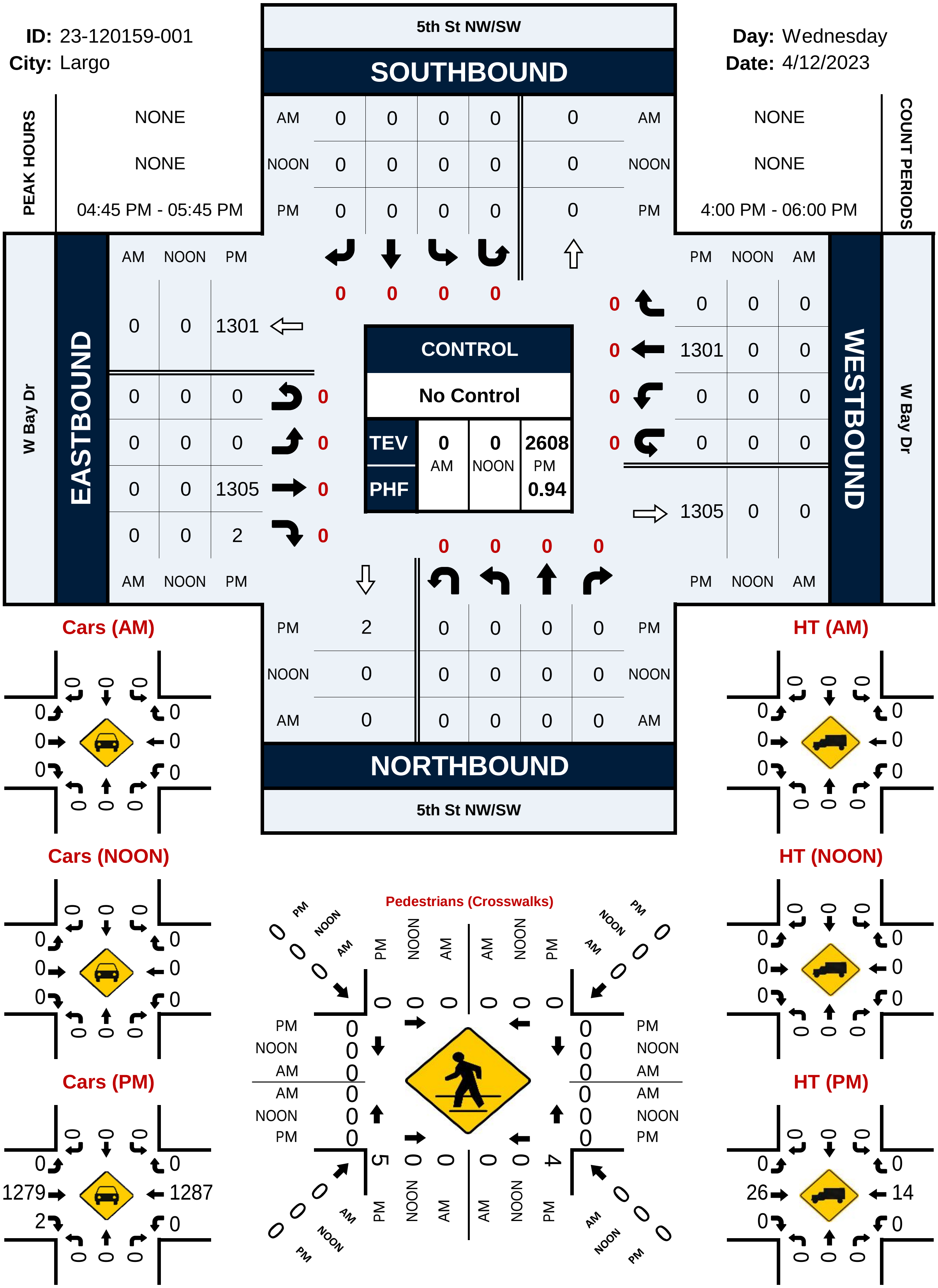
Prepared by National Data & Surveying Services

5th St NW/SW & W Bay Dr

Peak Hour Turning Movement Count

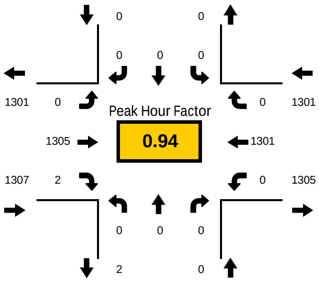
ID: 23-120159-001
City: Largo

Day: Wednesday
Date: 4/12/2023



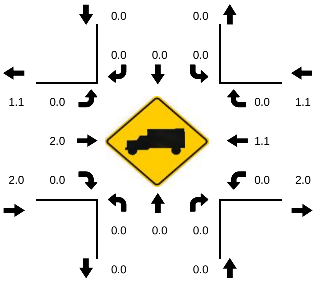
LOCATION: 5th St NW/SW & W Bay Dr
CITY/STATE: Largo, FL

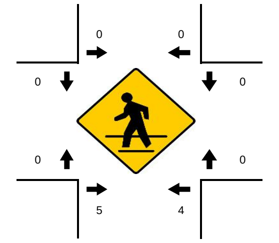
PROJECT ID: 23-120159-001
DATE: Wed, Apr 12, 2023

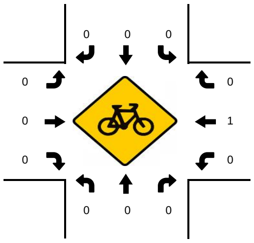


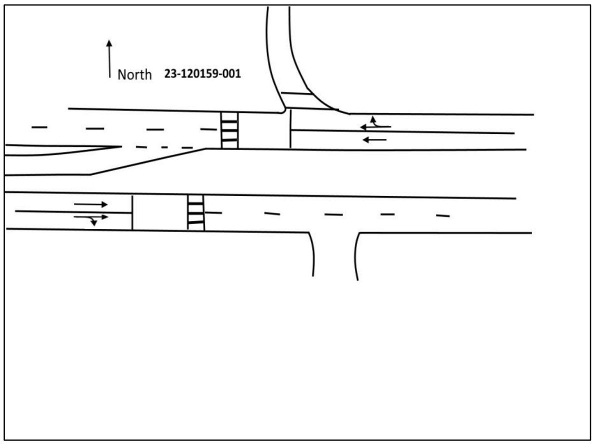
Peak-Hour: 04:45 PM - 05:45 PM
Peak 15-Minute: 05:00 PM - 05:15 PM

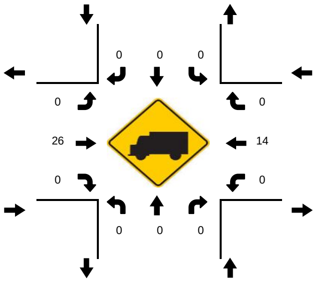
National Data & Surveying Services

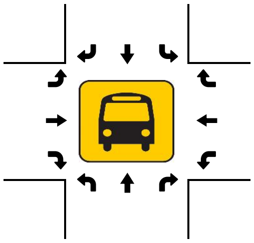












15-Min Count Period Beginning At	5th St NW/SW Northbound					5th St NW/SW Southbound					W Bay Dr Eastbound					W Bay Dr Westbound					Total	Hourly Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
4:00 PM	0	0	0	0		0	0	0	0		0	340	0	0		0	326	0	0		666	2560
4:15 PM	0	0	0	0		0	0	0	0		0	303	2	0		0	334	0	0		639	2588
4:30 PM	0	0	0	0		0	0	0	0		0	344	0	0		0	287	0	0		631	2606
4:45 PM	0	0	0	0		0	0	0	0		0	298	1	0		0	325	0	0		624	2608
5:00 PM	0	0	0	0		0	0	0	0		0	357	0	0		0	337	0	0		694	2551
5:15 PM	0	0	0	0		0	0	0	0		0	317	0	0		0	340	0	0		657	1857
5:30 PM	0	0	0	0		0	0	0	0		0	333	1	0		0	299	0	0		633	1200
5:45 PM	0	0	0	0		0	0	0	0		0	292	0	0		0	275	0	0		567	567
Peak 15-Min Flowrates	Northbound					Southbound					Eastbound					Westbound						
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Total	
All Vehicles	0	0	0	0		0	0	0	0		0	1428	4	0		0	1360	0	0		2792	
Heavy Trucks	0	0	0	0		0	0	0	0		0	32	0	0		0	20	0	0		52	
Pedestrians		20					0					0					0				20	
Bicycles	0	0	0	0		0	0	0	0		0	0	0	0		0	4	0	0		4	
Buses																						
Stopped Buses																						

National Data & Surveying Services

N/S Street: **Clearwater Largo Rd**

Speed: **35 MPH**

E/W Street: **W Bay Dr**

Speed: **30 MPH**

Site Code: **23-120159-003**

Date: **04/12/2023**

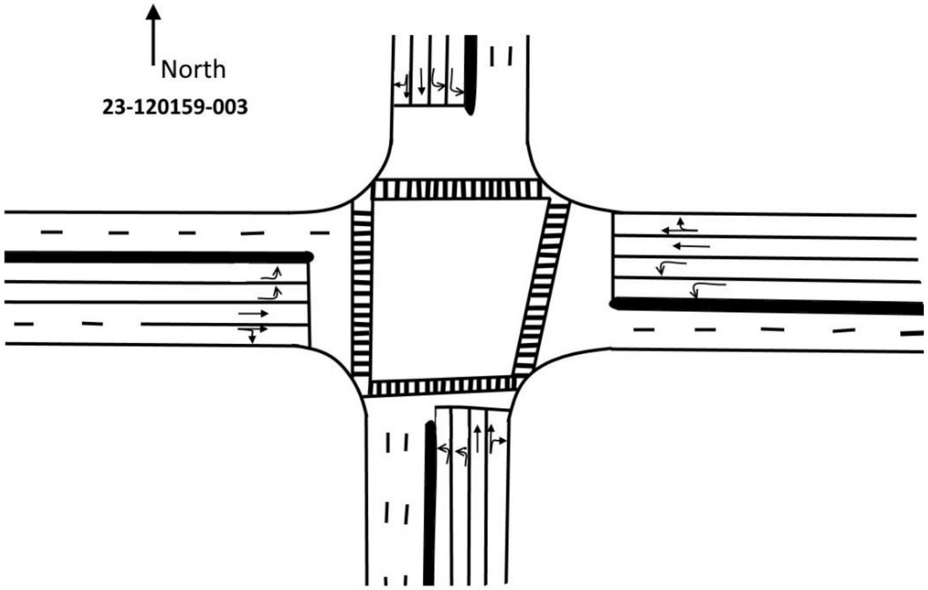
Weather: **Sunny**

City: **Largo**

County: **Pinellas**

Count Times: **16:00 - 18:00**

Control: **Signalized**



SIGNAL TIMING

PHASES	1	2	3
NL/NT	00:25	00:22	00:22
NT/ST	00:08	00:32	00:43
SL/ST	00:54	00:36	00:32
WL/WT	00:29	00:26	00:18
ET/WT	01:06	01:05	01:05
EL/ET	00:22	00:24	00:22

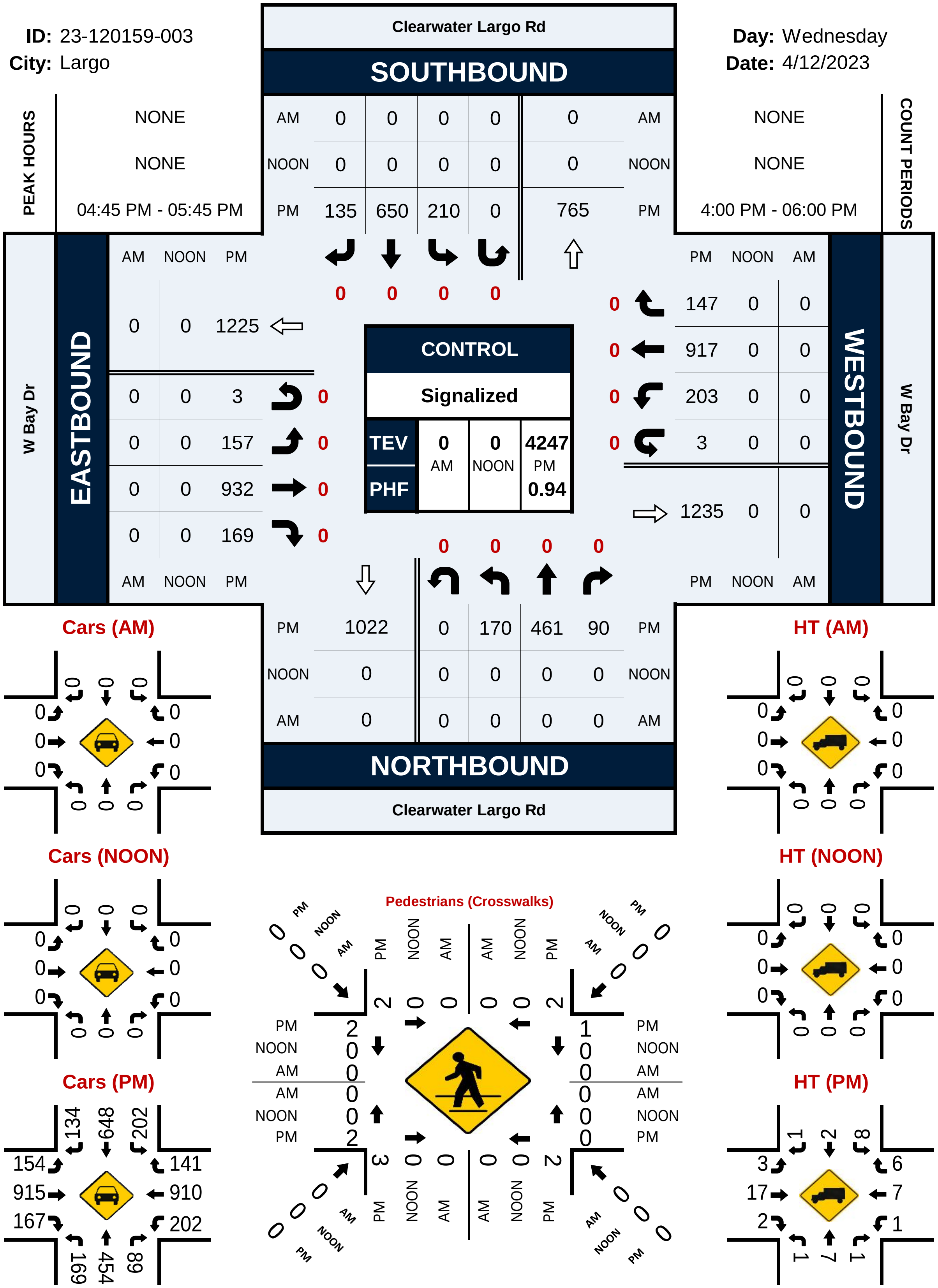
Prepared by National Data & Surveying Services

Clearwater Largo Rd & W Bay Dr

Peak Hour Turning Movement Count

ID: 23-120159-003
City: Largo

Day: Wednesday
Date: 4/12/2023



	PEAK HOURS	COUNT PERIODS
AM	NONE	NONE
NOON	NONE	NONE
PM	04:45 PM - 05:45 PM	4:00 PM - 06:00 PM

Clearwater Largo Rd

SOUTHBOUND

	↲	↓	↳	⮌	⇧
AM	0	0	0	0	0
NOON	0	0	0	0	0
PM	135	650	210	0	765
	0	0	0	0	

W Bay Dr

EASTBOUND

	AM	NOON	PM	
⇦	0	0	1225	
⮌	0	0	3	0
⮥	0	0	157	0
→	0	0	932	0
↴	0	0	169	0

WESTBOUND

W Bay Dr

		PM	NOON	AM
0	⮤	147	0	0
0	←	917	0	0
0	⮢	203	0	0
0	⮍	3	0	0
	⇨	1235	0	0

NORTHBOUND

Clearwater Largo Rd

		⮎	↰	↑	↱
		0	0	0	0
	⇩				
PM	1022	0	170	461	90
NOON	0	0	0	0	0
AM	0	0	0	0	0

CONTROL

Signalized

	AM	NOON	PM
TEV	0	0	4247
PHF			0.94

Cars (AM)

Cars (NOON)

Cars (PM)

HT (AM)

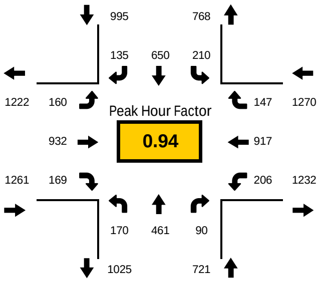
HT (NOON)

HT (PM)

Pedestrians (Crosswalks)

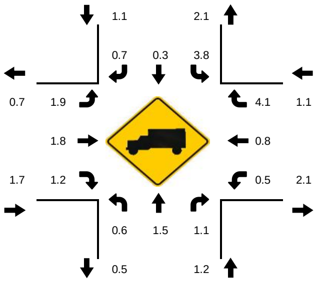
LOCATION: Clearwater Largo Rd & W Bay Dr
CITY/STATE: Largo, FL

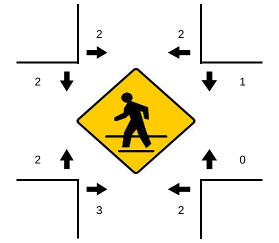
PROJECT ID: 23-120159-003
DATE: Wed, Apr 12, 2023

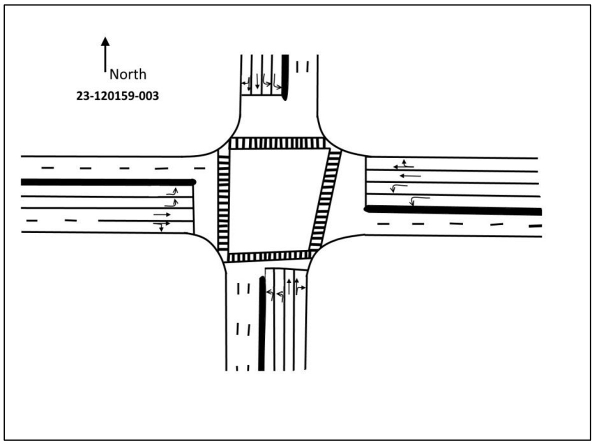


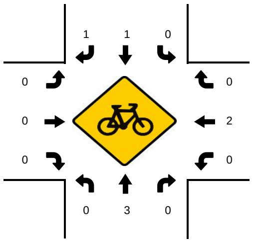
Peak-Hour: 04:45 PM - 05:45 PM
Peak 15-Minute: 05:00 PM - 05:15 PM

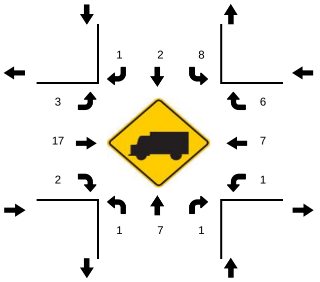
National Data & Surveying Services

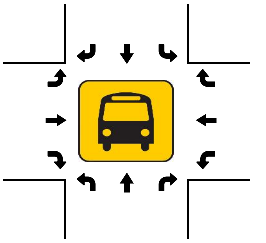












15-Min Count Period Beginning At	Clearwater Largo Rd Northbound					Clearwater Largo Rd Southbound					W Bay Dr Eastbound					W Bay Dr Westbound					Total	Hourly Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
4:00 PM	38	127	23	0		52	173	34	0		35	230	34	1		33	219	38	3		1040	4133
4:15 PM	58	94	14	1		42	147	22	0		42	253	41	2		56	253	42	2		1069	4223
4:30 PM	56	153	25	1		57	145	25	2		48	227	37	0		47	185	39	0		1047	4237
4:45 PM	45	98	18	0		53	144	26	0		39	203	34	0		56	221	39	1		977	4247
5:00 PM	43	133	29	0		57	151	36	0		45	246	54	2		52	233	49	0		1130	4174
5:15 PM	46	120	19	0		55	212	39	0		30	218	38	1		52	218	34	1		1083	3044
5:30 PM	36	110	24	0		45	143	34	0		43	265	43	0		43	245	25	1		1057	1961
5:45 PM	42	97	17	0		54	135	31	0		35	204	22	2		47	184	33	1		904	904
Peak 15-Min Flowrates	Northbound					Southbound					Eastbound					Westbound					Total	
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
All Vehicles	184	532	116	0		228	848	156	0		180	1060	216	8		224	980	196	4		**4932**	
Heavy Trucks	4	12	4	0		12	4	4	0		8	20	4	0		4	16	12	0		**104**	
Pedestrians		8					8					8					4				**28**	
Bicycles	0	8	0	0		0	4	4	0		0	0	0	0		0	4	0	0		**20**	
Buses																						
Stopped Buses																						

```
 2021 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
CATEGORY: 1500  PINELLAS COUNTYWIDE
                                                 MOCF: 0.96
WEEK          DATES                SF            PSCF
=================================================================================
  1    01/01/2021 - 01/02/2021     0.99          1.03
  2    01/03/2021 - 01/09/2021     1.07          1.11
  3    01/10/2021 - 01/16/2021     1.15          1.20
  4    01/17/2021 - 01/23/2021     1.13          1.18
  5    01/24/2021 - 01/30/2021     1.11          1.16
  6    01/31/2021 - 02/06/2021     1.09          1.14
  7    02/07/2021 - 02/13/2021     1.07          1.11
  8    02/14/2021 - 02/20/2021     1.05          1.09
  9    02/21/2021 - 02/27/2021     1.03          1.07
 10    02/28/2021 - 03/06/2021     1.01          1.05
 11    03/07/2021 - 03/13/2021     0.99          1.03
 12    03/14/2021 - 03/20/2021     0.97          1.01
 13    03/21/2021 - 03/27/2021     0.97          1.01
*14    03/28/2021 - 04/03/2021     0.97          1.01
*15    04/04/2021 - 04/10/2021     0.97          1.01
*16    04/11/2021 - 04/17/2021     0.97          1.01
*17    04/18/2021 - 04/24/2021     0.96          1.00
*18    04/25/2021 - 05/01/2021     0.96          1.00
*19    05/02/2021 - 05/08/2021     0.95          0.99
*20    05/09/2021 - 05/15/2021     0.95          0.99
*21    05/16/2021 - 05/22/2021     0.95          0.99
*22    05/23/2021 - 05/29/2021     0.95          0.99
*23    05/30/2021 - 06/05/2021     0.95          0.99
*24    06/06/2021 - 06/12/2021     0.95          0.99
*25    06/13/2021 - 06/19/2021     0.96          1.00
*26    06/20/2021 - 06/26/2021     0.97          1.01
 27    06/27/2021 - 07/03/2021     0.98          1.02
 28    07/04/2021 - 07/10/2021     0.99          1.03
 29    07/11/2021 - 07/17/2021     1.00          1.04
 30    07/18/2021 - 07/24/2021     1.01          1.05
 31    07/25/2021 - 07/31/2021     1.02          1.06
 32    08/01/2021 - 08/07/2021     1.03          1.07
 33    08/08/2021 - 08/14/2021     1.04          1.08
 34    08/15/2021 - 08/21/2021     1.04          1.08
 35    08/22/2021 - 08/28/2021     1.04          1.08
 36    08/29/2021 - 09/04/2021     1.04          1.08
 37    09/05/2021 - 09/11/2021     1.04          1.08
 38    09/12/2021 - 09/18/2021     1.04          1.08
 39    09/19/2021 - 09/25/2021     1.02          1.06
 40    09/26/2021 - 10/02/2021     1.01          1.05
 41    10/03/2021 - 10/09/2021     1.00          1.04
 42    10/10/2021 - 10/16/2021     0.98          1.02
 43    10/17/2021 - 10/23/2021     0.99          1.03
 44    10/24/2021 - 10/30/2021     0.99          1.03
 45    10/31/2021 - 11/06/2021     0.99          1.03
 46    11/07/2021 - 11/13/2021     1.00          1.04
 47    11/14/2021 - 11/20/2021     1.00          1.04
 48    11/21/2021 - 11/27/2021     1.00          1.04
 49    11/28/2021 - 12/04/2021     1.00          1.04
 50    12/05/2021 - 12/11/2021     1.00          1.04
 51    12/12/2021 - 12/18/2021     0.99          1.03
 52    12/19/2021 - 12/25/2021     1.07          1.11
 53    12/26/2021 - 12/31/2021     1.15          1.20

* PEAK SEASON

08-MAR-2022 12:36:28                         830UPD              7_1500_PKSEASON.TXT
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APPENDIX F:
Synchro Outputs, and
Traffic Signal Timing

3: Seminole Blvd/Missouri Ave N & W Bay Dr

Timing Plan: PM Peak-Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↱		↰↰	↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑↑↑	↱
Traffic Volume (vph)	169	1103	25	324	1074	292	159	868	343	260	842	212
Future Volume (vph)	169	1103	25	324	1074	292	159	868	343	260	842	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	230		0	290		390	200		190
Storage Lanes	2		0	2		1	2		1	1		1
Taper Length (ft)	80			90			100			170		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1411			903			1167			1345	
Travel Time (s)		27.5			17.6			19.9			22.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	2%	0%	2%	1%	1%	3%	1%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	184	1226	0	352	1167	317	173	943	373	283	915	230
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						2			4			8
Detector Phase	1	6		5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	12.8	22.5		12.8	22.5	22.5	13.6	22.5	22.5	12.4	22.5	22.5
Total Split (s)	23.0	79.0		27.0	83.0	83.0	51.0	51.0	51.0	23.0	23.0	23.0
Total Split (%)	12.8%	43.9%		15.0%	46.1%	46.1%	28.3%	28.3%	28.3%	12.8%	12.8%	12.8%
Maximum Green (s)	15.2	71.2		19.2	75.2	75.2	43.6	43.6	43.6	15.6	15.6	15.6
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.8	4.8	4.8	4.8	4.8	4.8
All-Red Time (s)	3.8	3.8		3.8	3.8	3.8	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.8	7.8		7.8	7.8	7.8	7.4	7.4	7.4	7.4	7.4	7.4
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max	Max	None	None	None
v/c Ratio	0.78	0.88		0.96	0.76	0.45	0.73	0.76	0.87	0.94	0.69	0.49
Control Delay	103.5	58.7		116.5	47.6	37.3	99.0	67.9	75.1	119.2	63.8	43.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.5	58.7		116.5	47.6	37.3	99.0	67.9	75.1	119.2	63.8	43.0
Queue Length 50th (ft)	111	704		217	613	252	105	383	366	174	360	160
Queue Length 95th (ft)	157	806		#325	716	354	147	439	#552	#272	427	263
Internal Link Dist (ft)		1331			823			1087			1265	
Turn Bay Length (ft)	200			230			290		390	200		190
Base Capacity (vph)	281	1397		366	1540	698	823	1244	429	300	1328	466
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.88		0.96	0.76	0.45	0.21	0.76	0.87	0.94	0.69	0.49

Intersection Summary

Area Type: Other

Cycle Length: 180

Actuated Cycle Length: 180

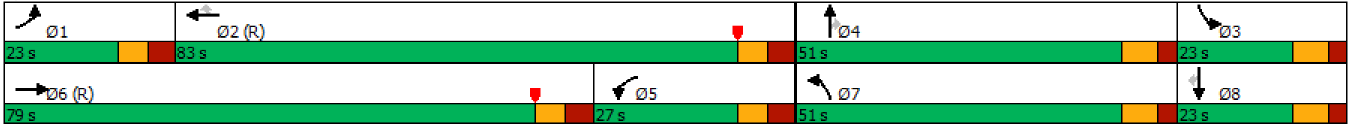
Offset: 112 (62%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow

Natural Cycle: 130

Control Type: Actuated-Coordinated

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Seminole Blvd/Missouri Ave N & W Bay Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↱		↰↰	↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑↑↑	↱
Traffic Volume (veh/h)	169	1103	25	324	1074	292	159	868	343	260	842	212
Future Volume (veh/h)	169	1103	25	324	1074	292	159	868	343	260	842	212
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1870	1900	1870	1885	1885	1856	1885	1870	1885	1885	1885
Adj Flow Rate, veh/h	184	1199	27	352	1167	317	173	943	373	283	915	230
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	2	0	2	1	1	3	1	2	1	1	1
Cap, veh/h	220	1405	32	369	1565	698	211	1247	384	302	1376	427
Arrive On Green	0.07	0.40	0.40	0.11	0.44	0.44	0.06	0.24	0.24	0.09	0.27	0.27
Sat Flow, veh/h	3374	3553	80	3456	3582	1598	3428	5147	1585	3483	5147	1598
Grp Volume(v), veh/h	184	599	627	352	1167	317	173	943	373	283	915	230
Grp Sat Flow(s),veh/h/ln	1687	1777	1856	1728	1791	1598	1714	1716	1585	1742	1716	1598
Q Serve(g_s), s	9.7	55.4	55.4	18.2	49.0	17.5	9.0	30.6	42.0	14.5	28.5	22.2
Cycle Q Clear(g_c), s	9.7	55.4	55.4	18.2	49.0	17.5	9.0	30.6	42.0	14.5	28.5	22.2
Prop In Lane	1.00		0.04	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	220	703	734	369	1565	698	211	1247	384	302	1376	427
V/C Ratio(X)	0.84	0.85	0.85	0.95	0.75	0.45	0.82	0.76	0.97	0.94	0.67	0.54
Avail Cap(c_a), veh/h	285	703	734	369	1565	698	830	1247	384	302	1376	427
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	83.2	49.6	49.6	80.0	42.3	17.2	83.5	63.3	67.6	81.7	58.8	56.4
Incr Delay (d2), s/veh	10.6	10.7	10.4	34.9	3.3	2.1	3.0	4.3	39.3	35.2	1.0	0.7
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(95%),veh/ln	7.8	34.4	35.7	15.1	30.1	11.1	7.3	19.9	28.6	12.6	18.3	14.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.8	60.4	60.0	114.9	45.6	19.4	86.5	67.6	106.9	116.9	59.8	57.2
LnGrp LOS	F	E	E	F	D	B	F	E	F	F	E	E
Approach Vol, veh/h		1410			1836			1489			1428	
Approach Delay, s/veh		64.6			54.3			79.6			70.7	
Approach LOS		E			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.5	86.5	23.0	51.0	27.0	79.0	18.5	55.5
Change Period (Y+Rc), s	* 7.8	* 7.8	7.4	7.4	* 7.8	* 7.8	7.4	7.4
Max Green Setting (Gmax), s	* 15	* 75	15.6	43.6	* 19	* 71	43.6	15.6
Max Q Clear Time (g_c+I1), s	11.7	51.0	16.5	44.0	20.2	57.4	11.0	30.5
Green Ext Time (p_c), s	0.0	3.4	0.0	0.0	0.0	2.5	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	66.6
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			↰↑	↱		✥	
Traffic Volume (vph)	3	1314	16	52	1289	7	15	10	93	37	16	9
Future Volume (vph)	3	1314	16	52	1289	7	15	10	93	37	16	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	250		0	0		115	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	50			50			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		417			1411			435			587	
Travel Time (s)		9.5			32.1			9.9			13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	6%	1%	0%	0%	0%	2%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	1445	0	57	1409	0	0	27	101	0	67	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Detector Phase	6	6		5	2		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	25.2	25.2		12.2	25.2		26.4	26.4	26.4	26.4	26.4	
Total Split (s)	148.0	148.0		19.0	167.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	72.5%	72.5%		9.3%	81.9%		18.1%	18.1%	18.1%	18.1%	18.1%	
Maximum Green (s)	140.8	140.8		11.8	159.8		28.6	28.6	28.6	28.6	28.6	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	3.5	3.5		3.5	3.5		4.7	4.7	4.7	4.7	4.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)	7.2	7.2		7.2	7.2			8.4	8.4		8.4	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	
v/c Ratio	0.01	0.51		0.21	0.46			0.31	0.69		0.74	
Control Delay	1.0	1.6		4.1	3.8			98.9	66.3		128.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	1.0	1.6		4.1	3.8			98.9	66.3		128.1	
Queue Length 50th (ft)	0	63		9	184			36	60		85	
Queue Length 95th (ft)	m1	77		20	262			74	132		146	
Internal Link Dist (ft)		337			1331			355			507	
Turn Bay Length (ft)	150			250					115			
Base Capacity (vph)	290	2840		317	3086			208	270		212	
Starvation Cap Reductn	0	0		0	0			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	0.01	0.51		0.18	0.46			0.13	0.37		0.32	

Intersection Summary	
Area Type:	Other
Cycle Length: 204	
Actuated Cycle Length: 204	
Offset: 48 (24%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 20: 4th St NW & W Bay Dr

20: 4th St NW & W Bay Dr

Timing Plan: PM Peak-Hour

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		✣	
Traffic Volume (veh/h)	3	1314	16	52	1289	7	15	10	93	37	16	9
Future Volume (veh/h)	3	1314	16	52	1289	7	15	10	93	37	16	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1900	1811	1885	1900	1900	1900	1870	1900	1900	1900
Adj Flow Rate, veh/h	3	1428	17	57	1401	8	16	11	101	40	17	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	6	1	0	0	0	2	0	0	0
Cap, veh/h	329	2847	34	359	3105	18	87	53	116	79	32	14
Arrive On Green	1.00	1.00	1.00	0.02	0.85	0.85	0.07	0.07	0.07	0.07	0.07	0.07
Sat Flow, veh/h	388	3597	43	1725	3652	21	804	727	1585	688	435	197
Grp Volume(v), veh/h	3	705	740	57	687	722	27	0	101	67	0	0
Grp Sat Flow(s),veh/h/ln	388	1777	1863	1725	1791	1881	1532	0	1585	1320	0	0
Q Serve(g_s), s	0.1	0.0	0.0	1.2	19.0	19.0	0.0	0.0	12.9	7.5	0.0	0.0
Cycle Q Clear(g_c), s	7.1	0.0	0.0	1.2	19.0	19.0	3.1	0.0	12.9	10.6	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.01	0.59		1.00	0.60		0.15
Lane Grp Cap(c), veh/h	329	1406	1474	359	1523	1600	140	0	116	125	0	0
V/C Ratio(X)	0.01	0.50	0.50	0.16	0.45	0.45	0.19	0.00	0.87	0.54	0.00	0.00
Avail Cap(c_a), veh/h	329	1406	1474	418	1523	1600	246	0	222	223	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.63	0.63	0.63	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.2	0.0	0.0	3.3	3.7	3.7	89.0	0.0	93.6	92.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	1.3	1.2	0.0	0.6	0.6	0.2	0.0	7.4	1.3	0.0	0.0
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(95%),veh/ln	0.0	0.9	0.9	0.7	9.8	10.2	2.5	0.0	9.5	6.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	1.3	1.2	3.3	4.3	4.3	89.2	0.0	100.9	94.2	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	F	A	F	F	A	A
Approach Vol, veh/h		1448			1466			128			67	
Approach Delay, s/veh		1.2			4.3			98.5			94.2	
Approach LOS		A			A			F			F	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		180.7		23.3	12.0	168.7		23.3				
Change Period (Y+Rc), s		* 7.2		* 8.4	* 7.2	* 7.2		* 8.4				
Max Green Setting (Gmax), s		* 1.6E2		* 29	* 12	* 1.4E2		* 29				
Max Q Clear Time (g_c+I1), s		21.0		14.9	3.2	9.1		12.6				
Green Ext Time (p_c), s		3.8		0.1	0.0	4.1		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			8.7									
HCM 6th LOS			A									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↱		↰↰	↑↱		↰↰	↑↱		↰↰	↑↱	
Traffic Volume (vph)	162	941	171	208	926	148	172	466	91	212	657	136
Future Volume (vph)	162	941	171	208	926	148	172	466	91	212	657	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	270		0	160		0	300		0
Storage Lanes	2		0	2		0	1		0	2		0
Taper Length (ft)	190			100			50			140		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			30			35			30	
Link Distance (ft)		1367			991			1080			1008	
Travel Time (s)		26.6			22.5			21.0			22.9	
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
Heavy Vehicles (%)	2%	2%	1%	1%	1%	4%	1%	2%	1%	4%	0%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	172	1183	0	221	1142	0	183	593	0	226	844	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	13.5	22.5		14.1	22.5		12.9	22.5		14.4	22.5	
Total Split (s)	24.0	90.0		27.0	93.0		23.0	56.0		31.0	64.0	
Total Split (%)	11.8%	44.1%		13.2%	45.6%		11.3%	27.5%		15.2%	31.4%	
Maximum Green (s)	15.5	82.3		17.9	85.3		15.1	48.3		21.6	56.3	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	4.5	3.7		5.1	3.7		3.9	3.7		5.4	3.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	7.7		9.1	7.7		7.9	7.7		9.4	7.7	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Max		None	C-Max		None	Min		None	Min	
v/c Ratio	0.78	0.79		0.73	0.71		0.81	0.91		0.53	0.94	
Control Delay	117.1	55.6		101.1	44.9		119.8	98.0		88.4	92.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	117.1	55.6		101.1	44.9		119.8	98.0		88.4	92.2	
Queue Length 50th (ft)	119	735		152	660		127	412		147	584	
Queue Length 95th (ft)	166	856		205	783		174	469		202	664	
Internal Link Dist (ft)		1287			911			1000			928	
Turn Bay Length (ft)	200			270			160			300		
Base Capacity (vph)	260	1498		304	1606		256	824		424	970	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.66	0.79		0.73	0.71		0.71	0.72		0.53	0.87	

Intersection Summary

Area Type: Other

Cycle Length: 204

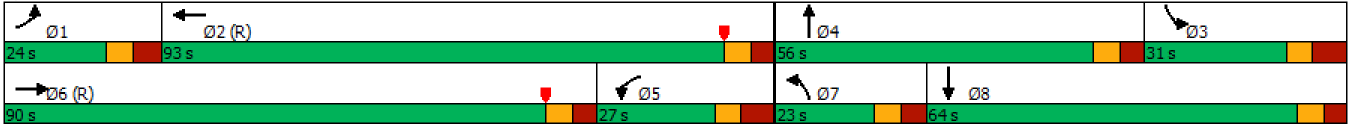
Actuated Cycle Length: 204

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow

Natural Cycle: 110

Control Type: Actuated-Coordinated

Splits and Phases: 21: Clearwater Largo Rd N & W Bay Dr



21: Clearwater Largo Rd N & W Bay Dr

Timing Plan: PM Peak-Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↱		↰↰	↑↱		↰↰	↑↱		↰↰	↑↱	
Traffic Volume (veh/h)	162	941	171	208	926	148	172	466	91	212	657	136
Future Volume (veh/h)	162	941	171	208	926	148	172	466	91	212	657	136
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1885	1885	1885	1841	1885	1870	1885	1841	1900	1885
Adj Flow Rate, veh/h	172	1001	182	221	985	157	183	496	97	226	699	145
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	1	1	1	4	1	2	1	4	0	1
Cap, veh/h	205	1212	220	417	1423	227	216	535	104	443	737	153
Arrive On Green	0.06	0.40	0.40	0.24	0.92	0.92	0.06	0.18	0.18	0.13	0.25	0.25
Sat Flow, veh/h	3456	3004	545	3483	3095	493	3483	2966	577	3401	2977	617
Grp Volume(v), veh/h	172	592	591	221	570	572	183	296	297	226	424	420
Grp Sat Flow(s),veh/h/ln	1728	1777	1772	1742	1791	1796	1742	1777	1766	1700	1805	1789
Q Serve(g_s), s	10.1	60.7	61.0	11.3	14.3	14.3	10.6	33.4	33.8	12.6	47.1	47.1
Cycle Q Clear(g_c), s	10.1	60.7	61.0	11.3	14.3	14.3	10.6	33.4	33.8	12.6	47.1	47.1
Prop In Lane	1.00		0.31	1.00		0.27	1.00		0.33	1.00		0.34
Lane Grp Cap(c), veh/h	205	717	715	417	824	826	216	321	319	443	447	443
V/C Ratio(X)	0.84	0.83	0.83	0.53	0.69	0.69	0.85	0.92	0.93	0.51	0.95	0.95
Avail Cap(c_a), veh/h	263	717	715	417	824	826	258	421	418	443	498	494
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	95.0	54.4	54.5	72.6	5.0	5.0	94.7	82.2	82.3	82.7	75.4	75.5
Incr Delay (d2), s/veh	14.1	10.5	10.6	0.7	4.7	4.7	17.3	19.6	21.1	0.4	25.4	25.8
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(95%),veh/ln	8.6	38.2	38.2	8.4	6.4	6.4	9.1	23.9	24.2	9.5	33.4	33.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.1	64.9	65.1	73.2	9.7	9.7	112.0	101.8	103.5	83.1	100.9	101.2
LnGrp LOS	F	E	E	E	A	A	F	F	F	F	F	F
Approach Vol, veh/h		1355			1363			776			1070	
Approach Delay, s/veh		70.6			20.0			104.8			97.3	
Approach LOS		E			C			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.6	102.9	35.9	44.5	33.5	90.0	20.5	59.9
Change Period (Y+Rc), s	8.5	* 9.1	* 9.4	* 7.7	* 9.1	* 7.7	7.9	* 9.4
Max Green Setting (Gmax), s	15.5	* 85	* 22	* 48	* 18	* 82	15.1	* 56
Max Q Clear Time (g_c+I1), s	12.1	16.3	14.6	35.8	13.3	63.0	12.6	49.1
Green Ext Time (p_c), s	0.0	2.9	0.1	1.1	0.1	2.7	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	67.6
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↱		↰↰	↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑↑↑	↱
Traffic Volume (vph)	192	1155	36	324	1109	292	167	868	343	260	842	227
Future Volume (vph)	192	1155	36	324	1109	292	167	868	343	260	842	227
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	230		0	290		390	200		190
Storage Lanes	2		0	2		1	2		1	1		1
Taper Length (ft)	80			90			100			170		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1411			903			1167			1345	
Travel Time (s)		27.5			17.6			19.9			22.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	2%	0%	2%	1%	1%	3%	1%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	209	1294	0	352	1205	317	182	943	373	283	915	247
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						2			4			8
Detector Phase	1	6		5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	12.8	22.5		12.8	22.5	22.5	13.6	22.5	22.5	12.4	22.5	22.5
Total Split (s)	23.0	79.0		27.0	83.0	83.0	51.0	51.0	51.0	23.0	23.0	23.0
Total Split (%)	12.8%	43.9%		15.0%	46.1%	46.1%	28.3%	28.3%	28.3%	12.8%	12.8%	12.8%
Maximum Green (s)	15.2	71.2		19.2	75.2	75.2	43.6	43.6	43.6	15.6	15.6	15.6
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.8	4.8	4.8	4.8	4.8	4.8
All-Red Time (s)	3.8	3.8		3.8	3.8	3.8	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.8	7.8		7.8	7.8	7.8	7.4	7.4	7.4	7.4	7.4	7.4
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max	Max	None	None	None
v/c Ratio	0.82	0.93		0.96	0.79	0.46	0.74	0.76	0.87	0.94	0.70	0.53
Control Delay	106.8	63.9		116.5	49.7	37.8	98.9	67.9	75.1	119.2	64.4	45.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.8	63.9		116.5	49.7	37.8	98.9	67.9	75.1	119.2	64.4	45.6
Queue Length 50th (ft)	127	766		217	654	256	110	383	366	174	362	180
Queue Length 95th (ft)	#178	#883		#325	750	354	153	439	#552	#272	429	290
Internal Link Dist (ft)		1331			823			1087			1265	
Turn Bay Length (ft)	200			230			290		390	200		190
Base Capacity (vph)	281	1395		366	1522	690	823	1244	429	300	1314	462
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.93		0.96	0.79	0.46	0.22	0.76	0.87	0.94	0.70	0.53

Intersection Summary

Area Type: Other

Cycle Length: 180

Actuated Cycle Length: 180

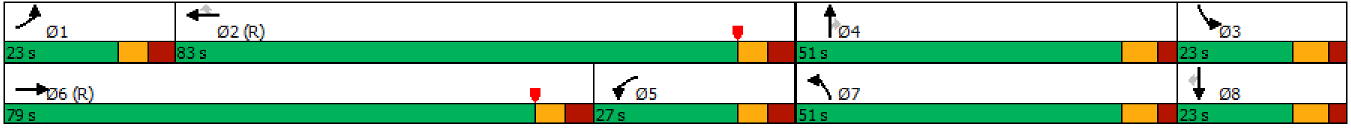
Offset: 112 (62%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow

Natural Cycle: 140

Control Type: Actuated-Coordinated

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Seminole Blvd/Missouri Ave N & W Bay Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↱		↰↰	↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑↑↑	↱
Traffic Volume (veh/h)	192	1155	36	324	1109	292	167	868	343	260	842	227
Future Volume (veh/h)	192	1155	36	324	1109	292	167	868	343	260	842	227
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1870	1900	1870	1885	1885	1856	1885	1870	1885	1885	1885
Adj Flow Rate, veh/h	209	1255	39	352	1205	317	182	943	373	283	915	247
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	2	0	2	1	1	3	1	2	1	1	1
Cap, veh/h	245	1392	43	369	1539	686	220	1247	384	302	1362	423
Arrive On Green	0.07	0.40	0.40	0.11	0.43	0.43	0.06	0.24	0.24	0.09	0.26	0.26
Sat Flow, veh/h	3374	3518	109	3456	3582	1598	3428	5147	1585	3483	5147	1598
Grp Volume(v), veh/h	209	633	661	352	1205	317	182	943	373	283	915	247
Grp Sat Flow(s),veh/h/ln	1687	1777	1851	1728	1791	1598	1714	1716	1585	1742	1716	1598
Q Serve(g_s), s	11.0	60.3	60.4	18.2	52.0	17.8	9.4	30.6	42.0	14.5	28.6	24.2
Cycle Q Clear(g_c), s	11.0	60.3	60.4	18.2	52.0	17.8	9.4	30.6	42.0	14.5	28.6	24.2
Prop In Lane	1.00		0.06	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	245	703	732	369	1539	686	220	1247	384	302	1362	423
V/C Ratio(X)	0.85	0.90	0.90	0.95	0.78	0.46	0.83	0.76	0.97	0.94	0.67	0.58
Avail Cap(c_a), veh/h	285	703	732	369	1539	686	830	1247	384	302	1362	423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	82.5	51.1	51.1	80.0	44.1	17.9	83.2	63.3	67.6	81.7	59.2	57.6
Incr Delay (d2), s/veh	14.4	14.2	13.8	34.9	4.1	2.2	3.0	4.3	39.3	35.2	1.1	1.4
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(95%),veh/ln	8.7	37.4	38.8	15.1	32.0	11.3	7.7	19.9	28.6	12.6	18.3	15.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.9	65.3	65.0	114.9	48.2	20.1	86.2	67.6	106.9	116.9	60.2	59.0
LnGrp LOS	F	E	E	F	D	C	F	E	F	F	E	E
Approach Vol, veh/h		1503			1874			1498			1445	
Approach Delay, s/veh		69.5			56.0			79.6			71.1	
Approach LOS		E			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.9	85.1	23.0	51.0	27.0	79.0	19.0	55.0
Change Period (Y+Rc), s	* 7.8	* 7.8	7.4	7.4	* 7.8	* 7.8	7.4	7.4
Max Green Setting (Gmax), s	* 15	* 75	15.6	43.6	* 19	* 71	43.6	15.6
Max Q Clear Time (g_c+I1), s	13.0	54.0	16.5	44.0	20.2	62.4	11.4	30.6
Green Ext Time (p_c), s	0.0	3.5	0.0	0.0	0.0	2.3	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	68.3
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰	↱	↰	↱	
Traffic Volume (vph)	38	1314	16	52	1310	45	15	10	93	124	16	48
Future Volume (vph)	38	1314	16	52	1310	45	15	10	93	124	16	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	250		0	0		115	215		0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (ft)	50			50			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		417			1411			435			587	
Travel Time (s)		9.5			32.1			9.9			13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	6%	1%	0%	0%	0%	2%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	1445	0	57	1473	0	0	27	101	135	69	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		6		5	2			4		3	8	
Permitted Phases	6			2			4		4	8		
Detector Phase	6	6		5	2		4	4	4	3	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	25.2	25.2		12.2	25.2		26.4	26.4	26.4	13.4	26.4	
Total Split (s)	87.0	87.0		17.0	104.0		40.0	40.0	40.0	60.0	100.0	
Total Split (%)	42.6%	42.6%		8.3%	51.0%		19.6%	19.6%	19.6%	29.4%	49.0%	
Maximum Green (s)	79.8	79.8		9.8	96.8		31.6	31.6	31.6	51.6	91.6	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	3.5	3.5		3.5	3.5		4.7	4.7	4.7	4.7	4.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.2	7.2		7.2	7.2			8.4	8.4	8.4	8.4	
Lead/Lag	Lag	Lag		Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	
v/c Ratio	0.20	0.60		0.27	0.55			0.38	0.77	0.61	0.22	
Control Delay	5.8	5.4		11.3	12.9			106.3	78.4	84.9	52.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	5.8	5.4		11.3	12.9			106.3	78.4	84.9	52.0	
Queue Length 50th (ft)	6	116		18	413			36	61	165	59	
Queue Length 95th (ft)	m12	316		42	593			75	133	226	105	
Internal Link Dist (ft)		337			1331			355			507	
Turn Bay Length (ft)	150			250					115	215		
Base Capacity (vph)	200	2413		237	2661			228	292	456	766	
Starvation Cap Reductn	0	0		0	0			0	0	0	0	
Spillback Cap Reductn	0	0		0	0			0	0	0	0	
Storage Cap Reductn	0	0		0	0			0	0	0	0	
Reduced v/c Ratio	0.20	0.60		0.24	0.55			0.12	0.35	0.30	0.09	

Intersection Summary

Area Type: Other

Cycle Length: 204

Actuated Cycle Length: 204

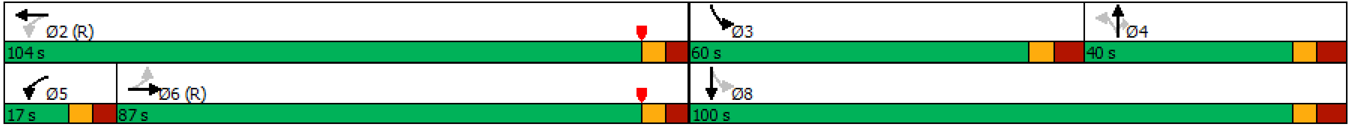
Offset: 48 (24%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

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

Splits and Phases: 20: 4th St NW & W Bay Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			↰	↱	↰	↱	
Traffic Volume (veh/h)	38	1314	16	52	1310	45	15	10	93	124	16	48
Future Volume (veh/h)	38	1314	16	52	1310	45	15	10	93	124	16	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1900	1811	1885	1900	1900	1900	1870	1900	1900	1900
Adj Flow Rate, veh/h	41	1428	17	57	1424	49	16	11	101	135	17	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	6	1	0	0	0	2	0	0	0
Cap, veh/h	236	2419	29	316	2584	89	89	54	116	252	79	242
Arrive On Green	1.00	1.00	1.00	0.02	0.73	0.73	0.07	0.07	0.07	0.08	0.19	0.19
Sat Flow, veh/h	365	3597	43	1725	3533	121	825	742	1585	1810	412	1261
Grp Volume(v), veh/h	41	705	740	57	721	752	27	0	101	135	0	69
Grp Sat Flow(s),veh/h/ln	365	1777	1863	1725	1791	1863	1566	0	1585	1810	0	1673
Q Serve(g_s), s	5.0	0.0	0.0	2.1	36.9	37.1	1.7	0.0	12.9	13.8	0.0	7.1
Cycle Q Clear(g_c), s	30.1	0.0	0.0	2.1	36.9	37.1	3.1	0.0	12.9	13.8	0.0	7.1
Prop In Lane	1.00		0.02	1.00		0.07	0.59		1.00	1.00		0.75
Lane Grp Cap(c), veh/h	236	1195	1253	316	1310	1363	143	0	116	252	0	321
V/C Ratio(X)	0.17	0.59	0.59	0.18	0.55	0.55	0.19	0.00	0.87	0.54	0.00	0.21
Avail Cap(c_a), veh/h	236	1195	1253	358	1310	1363	268	0	246	569	0	751
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.53	0.53	0.53	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.8	0.0	0.0	9.1	12.3	12.3	88.9	0.0	93.6	77.7	0.0	69.4
Incr Delay (d2), s/veh	1.6	2.1	2.1	0.1	0.9	0.9	0.2	0.0	7.3	0.7	0.0	0.1
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(95%),veh/ln	0.7	1.3	1.3	1.5	19.9	20.7	2.5	0.0	9.5	10.8	0.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.4	2.1	2.1	9.2	13.2	13.2	89.2	0.0	100.9	78.4	0.0	69.6
LnGrp LOS	A	A	A	A	B	B	F	A	F	E	A	E
Approach Vol, veh/h		1486			1530			128			204	
Approach Delay, s/veh		2.2			13.1			98.4			75.4	
Approach LOS		A			B			F			E	

Timer - Assigned Phs		2	3	4	5	6		8
Phs Duration (G+Y+Rc), s		156.4	24.2	23.4	12.0	144.4		47.6
Change Period (Y+Rc), s		* 7.2	* 8.4	* 8.4	* 7.2	* 7.2		* 8.4
Max Green Setting (Gmax), s		* 97	* 52	* 32	* 9.8	* 80		* 92
Max Q Clear Time (g_c+I1), s		39.1	15.8	14.9	4.1	32.1		9.1
Green Ext Time (p_c), s		4.2	0.1	0.1	0.0	4.7		0.2

Intersection Summary	
HCM 6th Ctrl Delay	15.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↱		↰↰	↑↱		↰↰	↑↱		↰↰	↑↱	
Traffic Volume (vph)	162	953	171	229	944	148	172	466	105	220	657	136
Future Volume (vph)	162	953	171	229	944	148	172	466	105	220	657	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	270		0	160		0	300		0
Storage Lanes	2		0	2		0	1		0	2		0
Taper Length (ft)	190			100			50			140		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			30			35			30	
Link Distance (ft)		1367			991			1080			1008	
Travel Time (s)		26.6			22.5			21.0			22.9	
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
Heavy Vehicles (%)	2%	2%	1%	1%	1%	4%	1%	2%	1%	4%	0%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	172	1196	0	244	1161	0	183	608	0	234	844	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	13.5	22.5		14.1	22.5		12.9	22.5		14.4	22.5	
Total Split (s)	23.0	89.0		28.0	94.0		23.0	56.4		30.6	64.0	
Total Split (%)	11.3%	43.6%		13.7%	46.1%		11.3%	27.6%		15.0%	31.4%	
Maximum Green (s)	14.5	81.3		18.9	86.3		15.1	48.7		21.2	56.3	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	4.5	3.7		5.1	3.7		3.9	3.7		5.4	3.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	7.7		9.1	7.7		7.9	7.7		9.4	7.7	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Max		None	C-Max		None	Min		None	Min	
v/c Ratio	0.80	0.81		0.76	0.72		0.81	0.91		0.57	0.94	
Control Delay	120.3	57.2		94.9	38.9		119.8	97.6		90.6	92.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	120.3	57.2		94.9	38.9		119.8	97.6		90.6	92.2	
Queue Length 50th (ft)	119	754		168	450		127	422		154	584	
Queue Length 95th (ft)	167	878		222	487		174	479		210	664	
Internal Link Dist (ft)		1287			911			1000			928	
Turn Bay Length (ft)	200			270			160			300		
Base Capacity (vph)	244	1481		321	1614		256	828		408	970	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.70	0.81		0.76	0.72		0.71	0.73		0.57	0.87	

21: Clearwater Largo Rd N & W Bay Dr

Intersection Summary

Area Type: Other

Cycle Length: 204

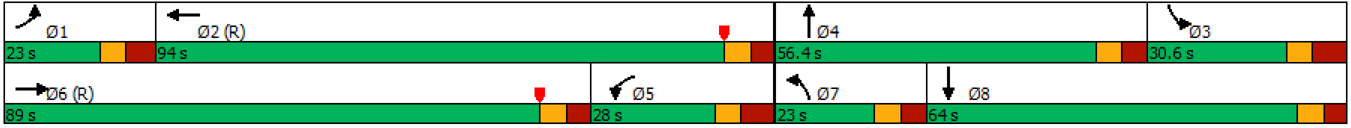
Actuated Cycle Length: 204

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow

Natural Cycle: 120

Control Type: Actuated-Coordinated

Splits and Phases: 21: Clearwater Largo Rd N & W Bay Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↱		↰↰	↑↱		↰↰	↑↱		↰↰	↑↱	
Traffic Volume (veh/h)	162	953	171	229	944	148	172	466	105	220	657	136
Future Volume (veh/h)	162	953	171	229	944	148	172	466	105	220	657	136
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1885	1885	1885	1841	1885	1870	1885	1841	1900	1885
Adj Flow Rate, veh/h	172	1014	182	244	1004	157	183	496	112	234	699	145
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	1	1	1	4	1	2	1	4	0	1
Cap, veh/h	205	1200	215	434	1428	223	216	535	120	426	737	153
Arrive On Green	0.06	0.40	0.40	0.25	0.92	0.92	0.06	0.19	0.19	0.13	0.25	0.25
Sat Flow, veh/h	3456	3011	539	3483	3104	485	3483	2883	648	3401	2977	617
Grp Volume(v), veh/h	172	598	598	244	579	582	183	305	303	234	424	420
Grp Sat Flow(s),veh/h/ln	1728	1777	1773	1742	1791	1798	1742	1777	1754	1700	1805	1789
Q Serve(g_s), s	10.1	62.2	62.5	12.5	14.9	15.0	10.6	34.4	34.8	13.2	47.1	47.1
Cycle Q Clear(g_c), s	10.1	62.2	62.5	12.5	14.9	15.0	10.6	34.4	34.8	13.2	47.1	47.1
Prop In Lane	1.00		0.30	1.00		0.27	1.00		0.37	1.00		0.34
Lane Grp Cap(c), veh/h	205	708	707	434	824	827	216	329	325	426	447	443
V/C Ratio(X)	0.84	0.84	0.85	0.56	0.70	0.70	0.85	0.92	0.93	0.55	0.95	0.95
Avail Cap(c_a), veh/h	246	708	707	434	824	827	258	424	419	426	498	494
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	95.0	55.6	55.7	71.7	5.0	5.0	94.7	81.7	81.8	83.8	75.4	75.5
Incr Delay (d2), s/veh	16.8	11.8	12.0	1.0	5.0	5.0	17.3	20.2	22.0	0.9	25.4	25.8
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(95%),veh/ln	8.7	39.2	39.3	9.0	6.5	6.6	9.1	24.6	24.7	9.9	33.4	33.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	111.8	67.4	67.7	72.7	10.0	10.0	112.0	101.9	103.8	84.7	100.9	101.2
LnGrp LOS	F	E	E	E	A	A	F	F	F	F	F	F
Approach Vol, veh/h		1368			1405			791			1078	
Approach Delay, s/veh		73.1			20.9			105.0			97.5	
Approach LOS		E			C			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.6	102.9	34.9	45.5	34.5	89.0	20.5	59.9
Change Period (Y+Rc), s	8.5	* 9.1	* 9.4	* 7.7	* 9.1	* 7.7	7.9	* 9.4
Max Green Setting (Gmax), s	14.5	* 86	* 21	* 49	* 19	* 81	15.1	* 56
Max Q Clear Time (g_c+I1), s	12.1	17.0	15.2	36.8	14.5	64.5	12.6	49.1
Green Ext Time (p_c), s	0.0	3.0	0.1	1.1	0.1	2.7	0.0	1.4

Intersection Summary			
HCM 6th Ctrl Delay			68.4
HCM 6th LOS			E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↱		↰↰	↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑↑↑	↱
Traffic Volume (vph)	203	1191	42	324	1160	292	176	868	343	260	842	242
Future Volume (vph)	203	1191	42	324	1160	292	176	868	343	260	842	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	230		0	290		390	200		190
Storage Lanes	2		0	2		1	2		1	1		1
Taper Length (ft)	80			90			100			170		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1411			903			1167			1345	
Travel Time (s)		27.5			17.6			19.9			22.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	2%	0%	2%	1%	1%	3%	1%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	221	1341	0	352	1261	317	191	943	373	283	915	263
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						2			4			8
Detector Phase	1	6		5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	12.8	22.5		12.8	22.5	22.5	13.6	22.5	22.5	12.4	22.5	22.5
Total Split (s)	23.0	79.0		27.0	83.0	83.0	51.0	51.0	51.0	23.0	23.0	23.0
Total Split (%)	12.8%	43.9%		15.0%	46.1%	46.1%	28.3%	28.3%	28.3%	12.8%	12.8%	12.8%
Maximum Green (s)	15.2	71.2		19.2	75.2	75.2	43.6	43.6	43.6	15.6	15.6	15.6
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.8	4.8	4.8	4.8	4.8	4.8
All-Red Time (s)	3.8	3.8		3.8	3.8	3.8	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.8	7.8		7.8	7.8	7.8	7.4	7.4	7.4	7.4	7.4	7.4
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max	Max	None	None	None
v/c Ratio	0.85	0.96		0.96	0.83	0.46	0.74	0.76	0.87	0.94	0.70	0.57
Control Delay	108.7	69.0		116.5	52.3	38.0	98.7	67.9	75.1	119.2	65.0	48.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.7	69.0		116.5	52.3	38.0	98.7	67.9	75.1	119.2	65.0	48.3
Queue Length 50th (ft)	134	812		217	704	257	115	383	366	174	363	200
Queue Length 95th (ft)	#196	#966		#325	802	354	159	439	#552	#272	431	316
Internal Link Dist (ft)		1331			823			1087			1265	
Turn Bay Length (ft)	200			230			290		390	200		190
Base Capacity (vph)	281	1395		366	1515	687	823	1244	429	300	1300	458
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.96		0.96	0.83	0.46	0.23	0.76	0.87	0.94	0.70	0.57

Intersection Summary

Area Type: Other

Cycle Length: 180

Actuated Cycle Length: 180

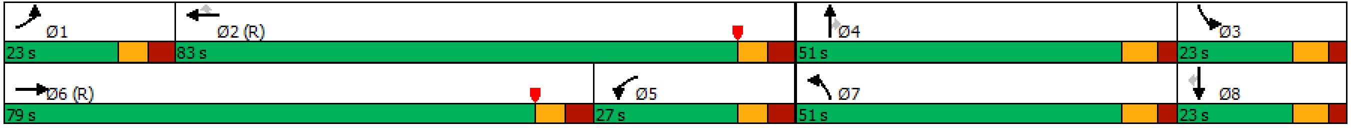
Offset: 112 (62%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow

Natural Cycle: 140

Control Type: Actuated-Coordinated

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Seminole Blvd/Missouri Ave N & W Bay Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑→		↰↰	↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑↑↑	↱
Traffic Volume (veh/h)	203	1191	42	324	1160	292	176	868	343	260	842	242
Future Volume (veh/h)	203	1191	42	324	1160	292	176	868	343	260	842	242
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1870	1900	1870	1885	1885	1856	1885	1870	1885	1885	1885
Adj Flow Rate, veh/h	221	1295	46	352	1261	317	191	943	373	283	915	263
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	2	0	2	1	1	3	1	2	1	1	1
Cap, veh/h	257	1385	49	369	1526	681	229	1247	384	302	1349	419
Arrive On Green	0.08	0.40	0.40	0.11	0.43	0.43	0.07	0.24	0.24	0.09	0.26	0.26
Sat Flow, veh/h	3374	3501	124	3456	3582	1598	3428	5147	1585	3483	5147	1598
Grp Volume(v), veh/h	221	657	684	352	1261	317	191	943	373	283	915	263
Grp Sat Flow(s),veh/h/ln	1687	1777	1848	1728	1791	1598	1714	1716	1585	1742	1716	1598
Q Serve(g_s), s	11.7	63.8	64.0	18.2	56.1	17.9	9.9	30.6	42.0	14.5	28.7	26.2
Cycle Q Clear(g_c), s	11.7	63.8	64.0	18.2	56.1	17.9	9.9	30.6	42.0	14.5	28.7	26.2
Prop In Lane	1.00		0.07	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	257	703	731	369	1526	681	229	1247	384	302	1349	419
V/C Ratio(X)	0.86	0.93	0.94	0.95	0.83	0.47	0.83	0.76	0.97	0.94	0.68	0.63
Avail Cap(c_a), veh/h	285	703	731	369	1526	681	830	1247	384	302	1349	419
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	82.2	52.2	52.2	80.0	45.7	18.2	83.0	63.3	67.6	81.7	59.6	58.7
Incr Delay (d2), s/veh	15.6	17.4	17.2	34.9	5.2	2.3	3.0	4.3	39.3	35.2	1.1	2.3
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(95%),veh/ln	9.0	39.7	41.1	15.1	34.4	11.4	7.9	19.9	28.6	12.6	18.4	16.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.8	69.6	69.4	114.9	51.0	20.5	86.0	67.6	106.9	116.9	60.7	60.9
LnGrp LOS	F	E	E	F	D	C	F	E	F	F	E	E
Approach Vol, veh/h		1562			1930			1507			1461	
Approach Delay, s/veh		73.5			57.6			79.7			71.7	
Approach LOS		E			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.5	84.5	23.0	51.0	27.0	79.0	19.4	54.6
Change Period (Y+Rc), s	* 7.8	* 7.8	7.4	7.4	* 7.8	* 7.8	7.4	7.4
Max Green Setting (Gmax), s	* 15	* 75	15.6	43.6	* 19	* 71	43.6	15.6
Max Q Clear Time (g_c+I1), s	13.7	58.1	16.5	44.0	20.2	66.0	11.9	30.7
Green Ext Time (p_c), s	0.0	3.6	0.0	0.0	0.0	1.8	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	69.8
HCM 6th LOS	E

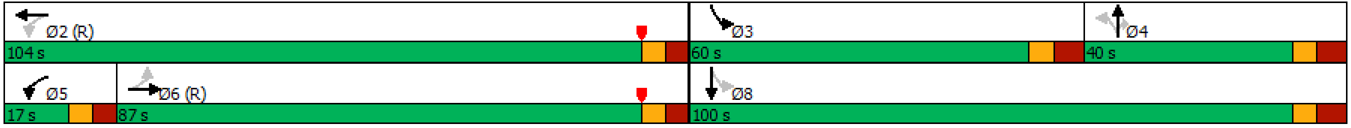
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			↰	↱	↰	↱	
Traffic Volume (vph)	38	1314	16	52	1378	51	15	10	93	177	16	48
Future Volume (vph)	38	1314	16	52	1378	51	15	10	93	177	16	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	250		0	0		115	215		0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (ft)	50			50			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		417			1411			435			587	
Travel Time (s)		9.5			32.1			9.9			13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	6%	1%	0%	0%	0%	2%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	1445	0	57	1553	0	0	27	101	192	69	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		6		5	2			4		3	8	
Permitted Phases	6			2			4		4	8		
Detector Phase	6	6		5	2		4	4	4	3	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	25.2	25.2		12.2	25.2		26.4	26.4	26.4	13.4	26.4	
Total Split (s)	87.0	87.0		17.0	104.0		40.0	40.0	40.0	60.0	100.0	
Total Split (%)	42.6%	42.6%		8.3%	51.0%		19.6%	19.6%	19.6%	29.4%	49.0%	
Maximum Green (s)	79.8	79.8		9.8	96.8		31.6	31.6	31.6	51.6	91.6	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	3.5	3.5		3.5	3.5		4.7	4.7	4.7	4.7	4.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.2	7.2		7.2	7.2			8.4	8.4	8.4	8.4	
Lead/Lag	Lag	Lag		Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	
v/c Ratio	0.25	0.63		0.29	0.61			0.38	0.77	0.69	0.19	
Control Delay	8.3	7.4		13.9	16.8			106.3	78.4	84.0	50.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	8.3	7.4		13.9	16.8			106.3	78.4	84.0	50.5	
Queue Length 50th (ft)	7	291		21	515			36	61	233	61	
Queue Length 95th (ft)	m20	326		47	729			75	133	299	103	
Internal Link Dist (ft)		337			1331			355			507	
Turn Bay Length (ft)	150			250					115	215		
Base Capacity (vph)	162	2305		221	2554			228	292	459	764	
Starvation Cap Reductn	0	0		0	0			0	0	0	0	
Spillback Cap Reductn	0	0		0	0			0	0	0	0	
Storage Cap Reductn	0	0		0	0			0	0	0	0	
Reduced v/c Ratio	0.25	0.63		0.26	0.61			0.12	0.35	0.42	0.09	

Intersection Summary	
Area Type:	Other
Cycle Length: 204	
Actuated Cycle Length: 204	
Offset: 48 (24%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 20: 4th St NW & W Bay Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			↰	↱	↰	↱	
Traffic Volume (veh/h)	38	1314	16	52	1378	51	15	10	93	177	16	48
Future Volume (veh/h)	38	1314	16	52	1378	51	15	10	93	177	16	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1900	1811	1885	1900	1900	1900	1870	1900	1900	1900
Adj Flow Rate, veh/h	41	1428	17	57	1498	55	16	11	101	192	17	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	6	1	0	0	0	2	0	0	0
Cap, veh/h	198	2316	28	306	2476	91	89	54	116	304	91	278
Arrive On Green	1.00	1.00	1.00	0.02	0.70	0.70	0.07	0.07	0.07	0.11	0.22	0.22
Sat Flow, veh/h	338	3597	43	1725	3524	129	825	742	1585	1810	412	1261
Grp Volume(v), veh/h	41	705	740	57	760	793	27	0	101	192	0	69
Grp Sat Flow(s),veh/h/ln	338	1777	1863	1725	1791	1862	1566	0	1585	1810	0	1673
Q Serve(g_s), s	7.7	0.0	0.0	2.3	44.7	45.0	1.7	0.0	12.9	19.6	0.0	6.8
Cycle Q Clear(g_c), s	40.7	0.0	0.0	2.3	44.7	45.0	3.1	0.0	12.9	19.6	0.0	6.8
Prop In Lane	1.00		0.02	1.00		0.07	0.59		1.00	1.00		0.75
Lane Grp Cap(c), veh/h	198	1144	1199	306	1258	1308	143	0	116	304	0	370
V/C Ratio(X)	0.21	0.62	0.62	0.19	0.60	0.61	0.19	0.00	0.87	0.63	0.00	0.19
Avail Cap(c_a), veh/h	198	1144	1199	348	1258	1308	268	0	246	569	0	751
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.46	0.46	0.46	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.1	0.0	0.0	11.0	15.7	15.7	88.9	0.0	93.6	75.0	0.0	64.6
Incr Delay (d2), s/veh	2.4	2.5	2.4	0.0	1.0	1.0	0.2	0.0	7.3	0.8	0.0	0.1
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(95%),veh/ln	1.1	1.4	1.4	1.6	23.6	24.6	2.5	0.0	9.5	14.3	0.0	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.5	2.5	2.4	11.1	16.7	16.7	89.2	0.0	100.9	75.8	0.0	64.7
LnGrp LOS	A	A	A	B	B	B	F	A	F	E	A	E
Approach Vol, veh/h		1486			1610			128			261	
Approach Delay, s/veh		2.6			16.5			98.4			72.9	
Approach LOS		A			B			F			E	
Timer - Assigned Phs		2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s		150.5	30.1	23.4	12.0	138.5		53.5				
Change Period (Y+Rc), s		* 7.2	* 8.4	* 8.4	* 7.2	* 7.2		* 8.4				
Max Green Setting (Gmax), s		* 97	* 52	* 32	* 9.8	* 80		* 92				
Max Q Clear Time (g_c+I1), s		47.0	21.6	14.9	4.3	42.7		8.8				
Green Ext Time (p_c), s		4.5	0.1	0.1	0.0	4.7		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			17.8									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↱		↰↰	↑↱		↰↰	↑↱		↰↰	↑↱	
Traffic Volume (vph)	162	965	171	242	953	148	172	466	124	220	657	136
Future Volume (vph)	162	965	171	242	953	148	172	466	124	220	657	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	270		0	160		0	300		0
Storage Lanes	2		0	2		0	1		0	2		0
Taper Length (ft)	190			100			50			140		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			30			35			30	
Link Distance (ft)		1367			991			1080			1008	
Travel Time (s)		26.6			22.5			21.0			22.9	
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
Heavy Vehicles (%)	2%	2%	1%	1%	1%	4%	1%	2%	1%	4%	0%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	172	1209	0	257	1171	0	183	628	0	234	844	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	13.5	22.5		14.1	22.5		12.9	22.5		14.4	22.5	
Total Split (s)	23.0	89.0		29.0	95.0		23.0	57.8		28.2	63.0	
Total Split (%)	11.3%	43.6%		14.2%	46.6%		11.3%	28.3%		13.8%	30.9%	
Maximum Green (s)	14.5	81.3		19.9	87.3		15.1	50.1		18.8	55.3	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	4.5	3.7		5.1	3.7		3.9	3.7		5.4	3.7	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	7.7		9.1	7.7		7.9	7.7		9.4	7.7	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Recall Mode	None	C-Max		None	C-Max		None	Min		None	Min	
v/c Ratio	0.80	0.82		0.76	0.72		0.81	0.91		0.62	0.95	
Control Delay	120.3	58.5		87.5	33.2		119.8	96.6		93.9	93.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	120.3	58.5		87.5	33.2		119.8	96.6		93.9	93.3	
Queue Length 50th (ft)	119	774		177	405		127	435		155	584	
Queue Length 95th (ft)	167	890		232	446		174	493		213	668	
Internal Link Dist (ft)		1287			911			1000			928	
Turn Bay Length (ft)	200			270			160			300		
Base Capacity (vph)	244	1469		338	1619		256	849		380	952	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.70	0.82		0.76	0.72		0.71	0.74		0.62	0.89	

Intersection Summary

Area Type: Other

Cycle Length: 204

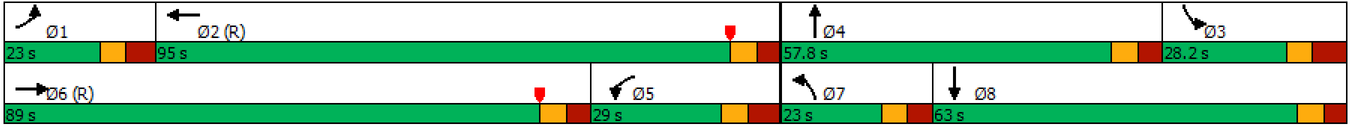
Actuated Cycle Length: 204

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow

Natural Cycle: 120

Control Type: Actuated-Coordinated

Splits and Phases: 21: Clearwater Largo Rd N & W Bay Dr



21: Clearwater Largo Rd N & W Bay Dr

Timing Plan: PM Peak-Hour

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↱		↰↰	↑↱		↰↰	↑↱		↰↰	↑↱	
Traffic Volume (veh/h)	162	965	171	242	953	148	172	466	124	220	657	136
Future Volume (veh/h)	162	965	171	242	953	148	172	466	124	220	657	136
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1885	1885	1885	1841	1885	1870	1885	1841	1900	1885
Adj Flow Rate, veh/h	172	1027	182	257	1014	157	183	496	132	234	699	145
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	1	1	1	4	1	2	1	4	0	1
Cap, veh/h	205	1203	213	436	1431	221	216	534	141	402	736	153
Arrive On Green	0.06	0.40	0.40	0.25	0.92	0.92	0.06	0.19	0.19	0.12	0.25	0.25
Sat Flow, veh/h	3456	3017	534	3483	3109	481	3483	2779	735	3401	2977	617
Grp Volume(v), veh/h	172	604	605	257	584	587	183	316	312	234	424	420
Grp Sat Flow(s),veh/h/ln	1728	1777	1774	1742	1791	1799	1742	1777	1738	1700	1805	1789
Q Serve(g_s), s	10.1	63.2	63.5	13.2	15.1	15.2	10.6	35.7	36.1	13.3	47.1	47.2
Cycle Q Clear(g_c), s	10.1	63.2	63.5	13.2	15.1	15.2	10.6	35.7	36.1	13.3	47.1	47.2
Prop In Lane	1.00		0.30	1.00		0.27	1.00		0.42	1.00		0.34
Lane Grp Cap(c), veh/h	205	708	707	436	825	828	216	341	334	402	446	442
V/C Ratio(X)	0.84	0.85	0.86	0.59	0.71	0.71	0.85	0.93	0.93	0.58	0.95	0.95
Avail Cap(c_a), veh/h	246	708	707	436	825	828	258	436	427	402	489	485
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	95.0	55.9	56.0	71.9	4.9	5.0	94.7	81.0	81.1	85.2	75.5	75.5
Incr Delay (d2), s/veh	16.8	12.4	12.6	1.4	5.1	5.1	17.3	20.3	22.2	1.4	26.4	26.7
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(95%),veh/ln	8.7	39.9	40.0	9.5	6.6	6.6	9.1	25.4	25.3	10.0	33.5	33.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	111.8	68.3	68.6	73.3	10.0	10.1	112.0	101.3	103.3	86.6	101.9	102.3
LnGrp LOS	F	E	E	E	B	B	F	F	F	F	F	F
Approach Vol, veh/h		1381			1428			811			1078	
Approach Delay, s/veh		73.9			21.4			104.5			98.7	
Approach LOS		E			C			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.6	103.0	33.5	46.9	34.6	89.0	20.5	59.8
Change Period (Y+Rc), s	8.5	* 9.1	* 9.4	* 7.7	* 9.1	* 7.7	7.9	* 9.4
Max Green Setting (Gmax), s	14.5	* 87	* 19	* 50	* 20	* 81	15.1	* 55
Max Q Clear Time (g_c+I1), s	12.1	17.2	15.3	38.1	15.2	65.5	12.6	49.2
Green Ext Time (p_c), s	0.0	3.0	0.1	1.1	0.1	2.7	0.0	1.3

Intersection Summary	
HCM 6th Ctrl Delay	68.9
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection **535**

Report Date: **04/11/2023**
Run Time: 02:45 PM

Main Street: EAST BAY DR
Side Street: SEMINOLE BLVD
Jurisdiction: STATE/COUNTY
Section #: 31 MIST
Comm. Addrs: IP: 10.198.120.150 Gateway: 10.198.120.1 Subnet: 255.255.254.0
Pre-empt: Y

Phase #	Street Name	Direction		Left Turn Type
1	EAST BAY DR	EB	LT LEAD	Restricted
2	EAST BAY DR	WB		
3	MISSOURI AVE.	SB	LT LAG	Restricted
4	SEMINOLE BLVD/MISSOURI	NB		
5	EAST BAY DR	WB	LT LAG	Restricted
6	WEST BAY DR	EB		
7	SEMINOLE BLVD.	NB	LT LEAD	Restricted
8	SEMINOLE BLVD./MISSOURI	SB		

Timing Plan 1 (MM,2,1)

PHASE	1	2	3	4	5	6	7	8
Min. Green	5	10	5	5	5	10	5	5
Walk		7		7		7		7
Ped Clr		36		28		37		27
Veh Ext	1	1	1	1	1	1	1	1
Yellow Clr	4.0	4.0	4.8	4.8	4.0	4.0	4.8	4.8
Red Clr	3.8	3.8	2.6	2.6	3.8	3.8	2.6	2.6
Max 1	35	45	30	50	35	45	30	50
Max 2	25	160	30	40	45	160	25	40
Max 3								
Walk 2								
Ped Clr 2								
Lock Det								
Veh Recall								
Ped Recall								
Max Recall								
CNA 1								
Phase In Use	X	X	X	X	X	X	X	X
Flash	R	Y	R	R	R	Y	R	R
Delay Det.								

Last Timing Change Date:	07/07/2021	**Database Modified:**	07/07/2021
Technician Initials:		**Control Room Pers. Initials:**	

COORD PATTERNS (CYCLE / OFFSET) (MM,3,2)

Cycle	Sec.
1	180
2	160
3	160
4	180
5	200

Offset	Sec. / %
1	179
2	80
3	70
4	112
5	0

COORD PATTERNS

	Ph 1 Sec / %	**Ph 2** Sec / %	**Ph 3** Sec / %	**Ph 4** Sec / %	**Ph 5** Sec / %	**Ph 6** Sec / %	**Ph 7** Sec / %	**Ph 8** Sec / %
PATTERN 1	25	84	25	46	30	79	25	46
PATTERN 2	21	72	21	46	21	72	21	46
PATTERN 3	21	67	26	46	26	62	21	51
PATTERN 4	20	89	25	46	45	64	25	46
PATTERN 5	25	94	30	51	30	89	30	51

DAY PLANS (MM,5,3)

	Event	Action Plan #	Time	Action	On/Off
DAY PLAN1					
	1	5	**0600**		
	2	5	**0930**		
	3	5	**1400**		
	4	3	**1930**		
	5	100	**2300**	FREE	ON
DAY PLAN2					
	1	3	**0630**		
	2	4	**0900**		
	3	3	**1900**		
	4	100	**2300**	FREE	ON

Notes: CSX RR 1-800-232-0149. RR ROADMASTER 1-677-3392 RR MAINT. 626-4027

*** SEE SPECIAL PROGRAM SHEETS FOR THE "NO RIGHT TURN" SIGNS OPERATION ***

MAX 2 TIMING DURING COORD

PLAN 1= AM PEAK 180
PLAN 2= OFF PEAK 160
PLAN 3= OFF PEAK 160
PLAN 4= PM PEAK 180
PLAN 5= CLEARING CYCLE 200

Intersection **533**

Report Date: **04/11/2023**
Run Time: 02:47 PM

Main Street: WEST BAY DR
Side Street: 4TH ST N
Jurisdiction: COUNTY
Section #: 31 MIST
Comm. Addrs: IP: 10.198.120.160 Gateway: 10.198.120.1 Subnet: 255.255.254.0
Pre-empt: Y

Phase #	Street Name	Direction		Left Turn Type
1				
2	WEST BAY DR	WB		
3				
4	4TH ST. W	NB		
5	WEST BAY DR.	WB	LT	Protected/Permitted
6	WEST BAY DR	EB		
7				
8	4TH ST. W.	SB		

Timing Plan 1 (MM,2,1)

PHASE	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Min. Green		10		5	5	10		5
Walk		7		7		7		7
Ped Clr		12		22		12		22
Veh Ext		1		1	1	1		1
Yellow Clr		3.7		3.7	3.7	3.7		3.7
Red Clr		3.5		4.7	3.5	3.5		4.7
Max 1		30		21	10	30		21
Max 2								
Max 3								
Walk 2								
Ped Clr 2								
Lock Det								
Veh Recall								
Ped Recall								
Max Recall								
CNA 1		X				X		
Phase In Use		X		X	X	X		X
Flash		Y		R		Y		R
Delay Det.								

Last Timing Change Date:	**07/19/2016**	**Database Modified:**	**09/20/2018**
Technician Initials:		**Control Room Pers. Initials:**	

Intersection #533
02:47 PM

COORD PATTERNS (CYCLE / OFFSET) (MM,3,2)

Cycle	Sec.
1	134
2	190
3	204
4	190
5	156

Offset	Sec. / %
1	75
2	48
3	48
4	61
5	30

COORD PATTERNS

	Ph 1 Sec / %	Ph 2 Sec / %	Ph 3 Sec / %	Ph 4 Sec / %	Ph 5 Sec / %	Ph 6 Sec / %	Ph 7 Sec / %	Ph 8 Sec / %
PATTERN 1		89		45	15	74		45
PATTERN 2		145		45	20	125		45
PATTERN 3		159		45	20	139		45
PATTERN 4		145		45	20	125		45
PATTERN 5		111		45	15	96		45

DAY PLANS (MM,5,3)

	Event	Action Plan #	Time	Action	On/Off
DAY PLAN1					
	1	1	**0600**		
	2	2	**0630**		
	3	3	**1800**		
	4	4	**1930**		
	5	100	**2200**	FREE	ON
DAY PLAN2					
	1	1	**0600**		
	2	5	**0700**		
	3	2	**0900**		
	4	5	**1900**		
	5	100	**2200**	FREE	ON

Notes:

PRE-EMPT 30 SEC. DELAY; 60 SEC DWELL; 4 SEC YELLOW; 2 SEC ALLL-RED
FIRE STATION #41, PHONE 587-6734
DELAY DETECTOR PH 4 NB RT LANE

PLAN 1= 134 EARLY MORNING
PLAN 2= 190 MORNING PEAK AND OFF PEAK
PLAN 3= 204 PM PEAK
PLAN 4 =190 PM LATE PEAK
PLAN 5= 156 PM OFF PEAK AND WEEKEND MORNINGS

Intersection **531**

Report Date: **04/11/2023**
Run Time: 02:48 PM

Main Street: WEST BAY DR
Side Street: CLW-LARGO RD
Jurisdiction: COUNTY
Section #: 31 MIST
Comm. Addrs: IP: 10.198.120.170 Gateway: 10.198.120.1 Subnet: 255.255.254.0
Pre-empt: Y

Phase #	Street Name	Direction		Left Turn Type
1	WEST BAY DR	EB	LT LEAD	Restricted
2	WEST BAY DR	WB		
3	CLEARWATER/LARGO	SB	LT LAG	Restricted
4	CLEARWATER/LARGO	NB		
5	WEST BAY DR	WB	LT LAG	Restricted
6	WEST BAY DR	EB		
7	CLEARWATER/LARGO	NB	LT LEAD	Restricted
8	CLEARWATER/LARGO	SB		

Timing Plan 1 (MM,2,1)

PHASE	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Min. Green	5	10	5	5	5	10	5	5
Walk		10		10		10		10
Ped Clr		30		33		30		33
Veh Ext	1	1	1	1	1	1	1	1
Yellow Clr	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Red Clr	4.5	3.7	5.4	3.7	5.1	3.7	3.9	3.7
Max 1	30	40	30	30	30	40	30	30
Max 2	25	160	25	40	25	160	30	40
Max 3								
Walk 2								
Ped Clr 2								
Lock Det								
Veh Recall								
Ped Recall								
Max Recall								
CNA 1								
Phase In Use	X	X	X	X	X	X	X	X
Flash	R	Y	R	R	R	Y	R	R
Delay Det.								

Last Timing Change Date:	**07/19/2016**	**Database Modified:**	**04/25/2022**
Technician Initials:		**Control Room Pers. Initials:**	

COORD PATTERNS (CYCLE / OFFSET) (MM,3,2)

Cycle	Sec.
1	134
2	190
3	204
4	190
5	156
6	134

Offset	Sec. / %
1	0
2	0
3	0
4	0
5	0
6	0

COORD PATTERNS

	Ph 1 Sec / %	Ph 2 Sec / %	Ph 3 Sec / %	Ph 4 Sec / %	Ph 5 Sec / %	Ph 6 Sec / %	Ph 7 Sec / %	Ph 8 Sec / %
PATTERN 1	20	60	20	34	20	60	20	34
PATTERN 2	25	83	25	57	25	83	25	57
PATTERN 3	25	97	25	57	25	97	25	57
PATTERN 4	25	83	25	57	25	83	25	57
PATTERN 5	20	59	20	57	20	59	20	57
PATTERN 6	20	60	20	34	20	60	20	34

DAY PLANS (MM,5,3)

	Event	Action Plan #	Time	Action	On/Off
DAY PLAN1					
	1	1	**0530**		
	2	2	**0630**		
	3	3	**1400**		
	4	4	**1800**		
	5	5	**1930**		
	6	6	**2200**		
	7	100	**2300**	FREE	ON
DAY PLAN2					
	1	1	**0600**		
	2	5	**0700**		
	3	2	**0900**		
	4	5	**1900**		
	5	6	**2200**		
	6	100	**2300**	FREE	ON

Notes: BACK UP TBC FOR ADAPTIVE

SEE NEXT PAGE

NON CNA OPERATION

PLAN 1= AM 134
PLAN 2= AM PEAK 190
PLAN 3= PM PEAK 204
PLAN 4= PM OFF PEAK 190
PLAN 5= PM EVENING 156
PLAN 6= LATE EVENING 134

RUNS VEH EXT 2 DURING COORDINATION

APPENDIX G:
FDOT Access Management Guidebook,
FDM Exhib 212-1, and
NCHRP Report 745

When Not to Consider Exclusive Right-Turn Lanes

- Dense or built-out corridors with limited space
- Right-turn lane that would negatively impact pedestrians or bicyclists
- Vehicular movements from driveways or median openings that cross the right-turn lane resulting in multiple threat crashes
- Context classifications C2T, C4, C5, or C6

When Exclusive Right-Turn Lanes are Beneficial

There are instances when adding an exclusive right-turn lane for unsignalized driveways are beneficial to traffic operations and safety. ***Table 27*** provides some guidance for this situation based on the speed limit of the roadway and how many right turns occur per hour. Locations where the Auto and Truck Modal Emphasis is "High" may be appropriate for consideration of Exclusive Right Turn Lanes.

Table 27 – Recommended Guidelines for Exclusive Right-Turn Lanes to Unsignalized Driveway[10]

Roadway Posted Speed Limit	Number of Right Turns Per Hour
45 mph or less	80 – 125[1]
Over 45 mph	35 – 55[2]
Note: A posted speed limit of 45 mph may be used with these thresholds if the operating speeds are known to be over 45 mph during the time of peak right turn demand.	
Note on traffic projections: Projecting turning volumes is, at best, a knowledgeable estimate. Keep this in mind especially if the projections of right turns are close to meeting the guidelines. In that case, consider requiring the turn lane.	
[1] The lower threshold of 80 right-turn vehicles per hour would be most used for higher volume (greater than 600 vehicles per hour, per lane in one direction on the major roadway) or two-lane roads where lateral movement is restricted. The 125 right-turn vehicles per hour upper threshold would be most appropriate on lower volume roadways, multilane highways, or driveways with a large entry radius (50 feet or greater).	
[2] The lower threshold of 35 right-turn vehicles per hour would be most appropriately used on higher volume two-lane roadways where lateral movement is restricted. The 55 right-turn vehicles per hour upper threshold would be most appropriate on lower volume roadways, multilane highways, or driveways with large entry radius (50 feet or greater).	

Source: NCHRP Report 420 (Impacts of Access Management Techniques)

These recommendations are primarily based on the research done in NCHRP Report 420, Impacts of Access Management Techniques, Chapter 4 – Unsignalized Access Spacing (Technique 1B), and Use of Speed Differential as a Measure to Evaluate the Need for Right-Turn Deceleration Lane at Unsignalized Intersections.

In the *NCHRP Report 420*, the observed high-speed roads, 30 to 40 right-turn vehicles per hour caused evasive maneuvers on 5 - 10 percent of the following through vehicles. For lower speed roadways, 80 to 110 right-turn vehicles caused 15 - 20 percent of the following through vehicles to make evasive maneuvers. The choice of acceptable percentages of through vehicles impacted is a decision based on reasonable expectations of the different roadways.

In this study, by modeling speed differentials, a better understanding of the impacts of through volume and driveway radius was discovered.

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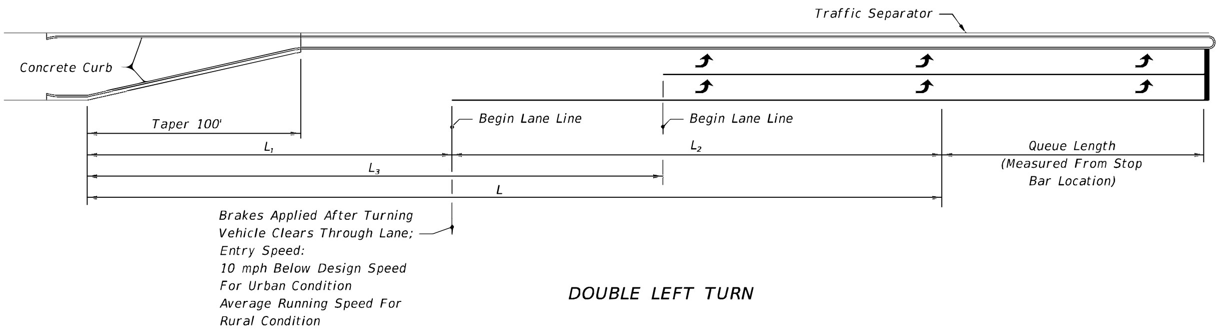
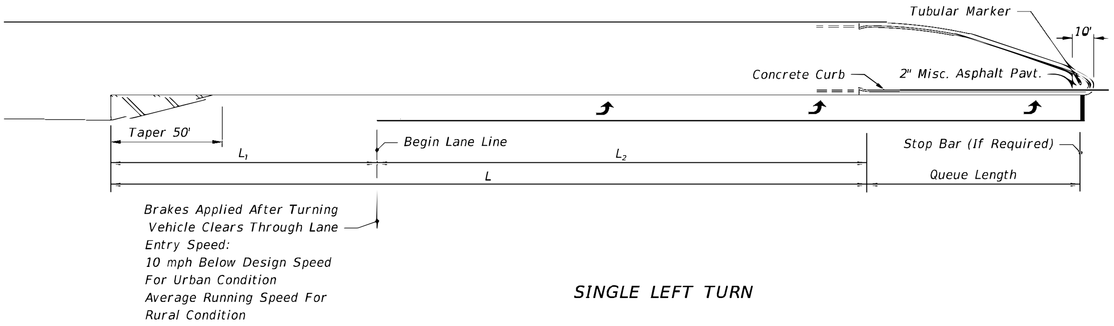
[10] May not be appropriate for signalized locations where signal phasing plays an important role in determining the need for right turn lanes.

MEDIAN TURN LANES
MINIMUM DECELERATION LENGTHS



DOUBLE LEFT TURN



SINGLE LEFT TURN

MEDIAN TURN LANES								
Design Speed (mph)	Entry Speed (mph)	Clearance Distance L_1 (ft.)	URBAN CONDITIONS			RURAL CONDITIONS		
			Brake To Stop Distance L_2 (ft.)	Total Decel. Distance L (ft.)	Clearance Distance L_3 (ft.)	Brake To Stop Distance L_2 (ft.)	Total Decel. Distance L (ft.)	Clearance Distance L_3 (ft.)
35	25	70	75	145	110	——	——	——
40	30	80	75	155	120	——	——	——
45	35	85	100	185	135	——	——	——
50	40/44	105	135	240	160	185	290	160
55	48	125	——	——	——	225	350	195
60	52	145	——	——	——	260	405	230
65	55	170	——	——	——	290	460	270

NOT TO SCALE

EXHIBIT 212-1
01/01/2023

of the steps a designer could take to determine whether a left-turn lane is appropriate for a particular location. Where there are no applicable access management guidelines, adequate spacing and design consistency are both essential requirements to consider.

Apply Left-Turn Lane Warrants

Warrants

After compiling all of the relevant information pertaining to a particular intersection, it is necessary to determine whether that information indicates that a left-turn lane is indeed necessary or beneficial. Left-turn lanes can reduce the potential for collisions and improve capacity by removing stopped vehicles from the main travel lane. The recommended left-turn lane warrants developed based on the NCHRP Project 3-91 research (*1*) are:

- Rural, two-lane highways (see Table 1),
- Rural, four-lane highways (see Table 2), and
- Urban and suburban roadways (see Table 3).

Table 1 also present warrants for a bypass lane treatment on two-lane rural highways. Given a peak-hour left-turn volume and a particular intersection configuration (i.e., number of legs, number of lanes on the major highway), the tables show the minimum peak-hour volume on the major highway that warrants a left-turn lane or bypass lane. Figure 2 displays the warrants for rural two-lane highways graphically. Figure 3 shows graphical warrants for four-lane rural highways, and Figure 4 shows the recommended warrants for urban and suburban arterials.

Technical warrants are an important element of the decision-making process; however, other factors should also be considered when deciding whether to install a left-turn lane, including:

- Sight distance relative to the position of the driver and
- Design consistency within the corridor.

These factors should be considered in conjunction with the numerical warrants. For example, if volumes indicate that a left-turn lane is not warranted but there is insufficient sight distance at the location for the left-turning vehicles, then the left-turn lane should be considered along with other potential changes (e.g., remove sight obstructions, realign the highway, etc.).

Source of Warrants—Benefit-Cost Approach

A benefit-cost approach was conducted as part of NCHRP Project 3-91 (*1*) to determine when a left-turn lane would be justified. Economic analysis can provide a useful method for combining traffic operations and safety benefits of left-turn lanes to identify situations in which left-turn lanes are and are not justified economically. The development steps included:

- Simulation to determine delay savings from installing a left-turn lane,
- Crash costs,
- Crash reduction savings determined from safety performance functions available in the AASHTO *Highway Safety Manual* (Chapter 10 discusses rural two-lane, two-way roads; Chapter 11 discusses rural multilane highways; and Chapter 12 discusses urban and suburban arterials) (*4*),

Table 1. Recommended left-turn treatment warrants for rural two-lane highways.

Left-Turn Lane Peak-Hour Volume (veh/hr)	Three-Leg Intersection, Major Two-Lane Highway Peak-Hour Volume (veh/hr/ln) That Warrants a Bypass Lane	Three-Leg Intersection, Major Two-Lane Highway Peak-Hour Volume (veh/hr/ln) That Warrants a Left-Turn Lane	Four-Leg Intersection, Major Two-Lane Highway Peak-Hour Volume (veh/hr/ln) That Warrants a Bypass Lane	Four-Leg Intersection, Major Two-Lane Highway Peak-Hour Volume (veh/hr/ln) That Warrants a Left-Turn Lane
5	50	200	50	150
10	50	100	< 50	50
15	< 50	100	< 50	50
20	< 50	50	< 50	< 50
25	< 50	50	< 50	< 50
30	< 50	50	< 50	< 50
35	< 50	50	< 50	< 50
40	< 50	50	< 50	< 50
45	< 50	50	< 50	< 50
50 or More	< 50	50	< 50	< 50

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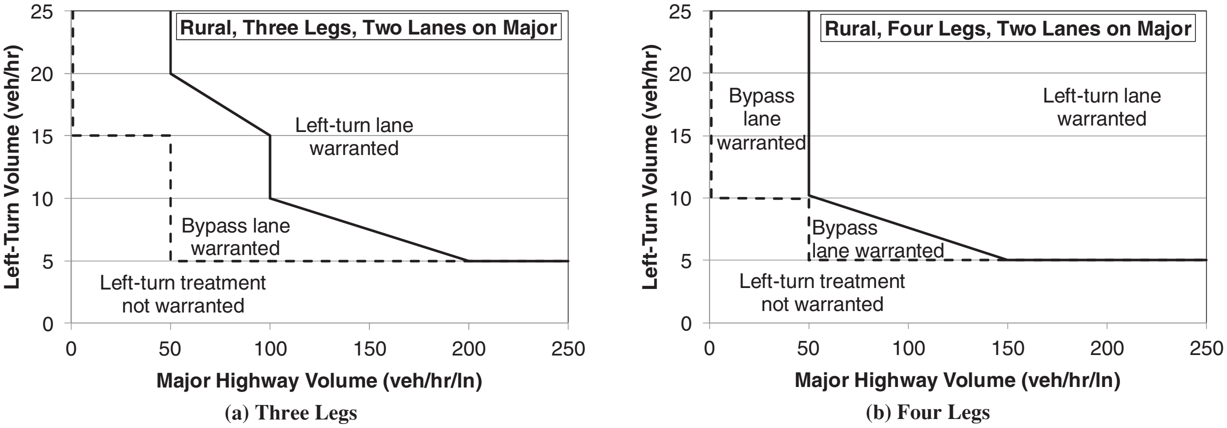
Table 2. Recommended left-turn lane warrants for rural four-lane highways.

Left-Turn Lane Peak-Hour Volume (veh/hr)	Three-Leg Intersection, Major Four-Lane Highway Peak-Hour Volume (veh/hr/ln) That Warrants a Left-Turn Lane	Four-Leg Intersection, Major Four-Lane Highway Peak-Hour Volume (veh/hr/ln) That Warrants a Left-Turn Lane
5	75	50
10	75	25
15	50	25
20	50	25
25	50	< 25
30	50	< 25
35	50	< 25
40	50	< 25
45	50	< 25
50 or More	50	< 25

Table 3. Recommended left-turn lane warrants for urban and suburban arterials.

Left-Turn Lane Peak-Hour Volume (veh/hr)	Three-Leg Intersection, Major Urban and Suburban Arterial Volume (veh/hr/ln) That Warrants a Left-Turn Lane	Four-Leg Intersection, Major Urban and Suburban Arterial Volume (veh/hr/ln) That Warrants a Left-Turn Lane
5	450	50
10	300	50
15	250	50
20	200	50
25	200	50
30	150	50
35	150	50
40	150	50
45	150	< 50
50 or More	100	< 50



(a) Three Legs (b) Four Legs

Figure 2. Recommended left-turn treatment warrants for intersections on rural two-lane highways.

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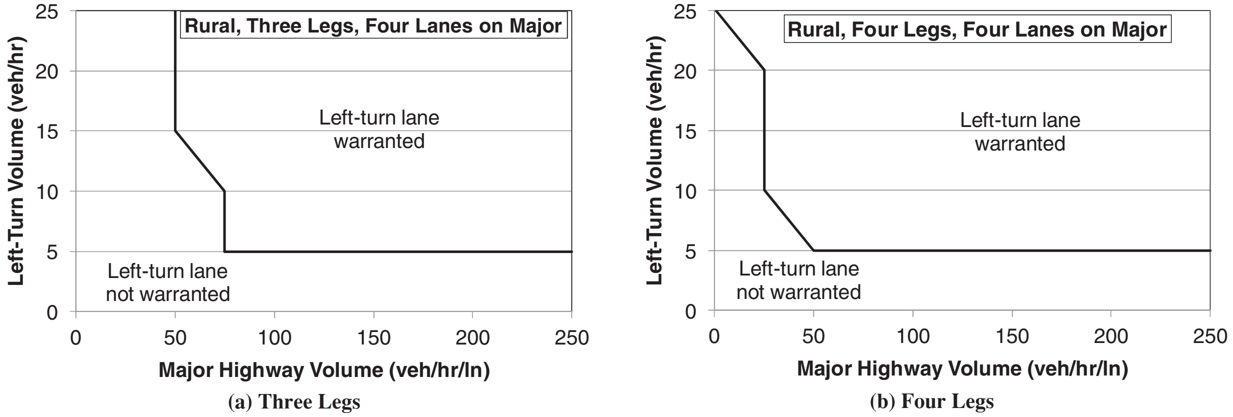


(a) Three Legs (b) Four Legs

Figure 3. Recommended left-turn lane warrants for intersections on rural four-lane highways.

- Crash modification factors available in the AASHTO *Highway Safety Manual* (*4*), and
- Construction costs.

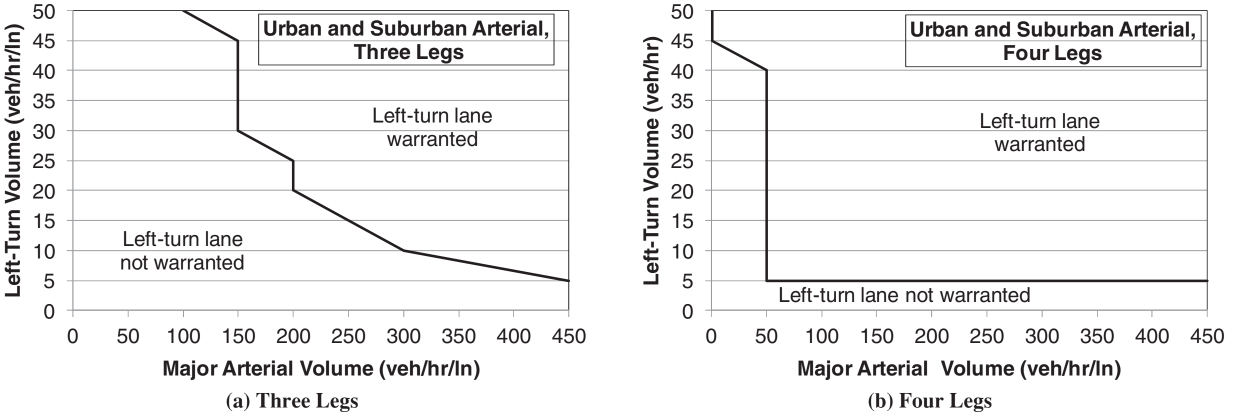
For rural conditions, different safety performance functions are provided for two- and four-lane highways and for three- and four-leg intersections. For urban and suburban arterials, prediction equations are provided for three-leg and four-leg intersections. Separate urban and suburban prediction equations are not provided based on the number of lanes on the major road approach. The prediction equations are not a function of speed limit; therefore, the developed warrants also are not a function of speed limit.

A range of values was used in the benefit-cost evaluation to identify volume conditions when the installation of a left-turn lane at unsignalized intersections and major driveways would be cost-effective. Plots and tables were developed that indicate combinations of major road traffic and left-turn lane volume where a left-turn lane would be recommended. Warrants were developed using the following:

- A range of values for the economic value of a statistical life,
- Crash costs based on values in the *Highway Safety Manual*,
- A range of construction costs, and
- A benefit-cost ratio of 1.0 and 2.0.

The research team suggested a benefit-cost ratio of 1.0 along with the mid-range economic value of a statistical life and moderate construction cost to identify the warrants for a left-turn treatment. For urban and suburban areas, that is a left-turn lane. For rural areas, that is a bypass lane. Benefit-cost ratio of 2.0 has been argued as being a more practical value to use to offset the potential variability in other assumptions. The warrants based on a benefit-cost ratio of 2.0 were selected for a left-turn lane on rural highways. These values were similar to the warrants that resulted when the lower crash costs based on older *Highway Safety Manual* costs were used.

Left-turn lanes can reduce the potential for collisions and improve capacity by removing stopped vehicles from the main travel lane. Left-turn lane warrants were developed as part of NCHRP Project 3-91 using an economic analysis procedure for rural, two-lane highways; rural, four-lane highways; and urban and suburban roadways. The methodology presented in the NCHRP Project 3-91 report (*1*) could also be used if a transportation agency has available local values for delay



(a) Three Legs (b) Four Legs

Figure 4. Recommended left-turn lane warrants for intersections on urban and suburban arterials.

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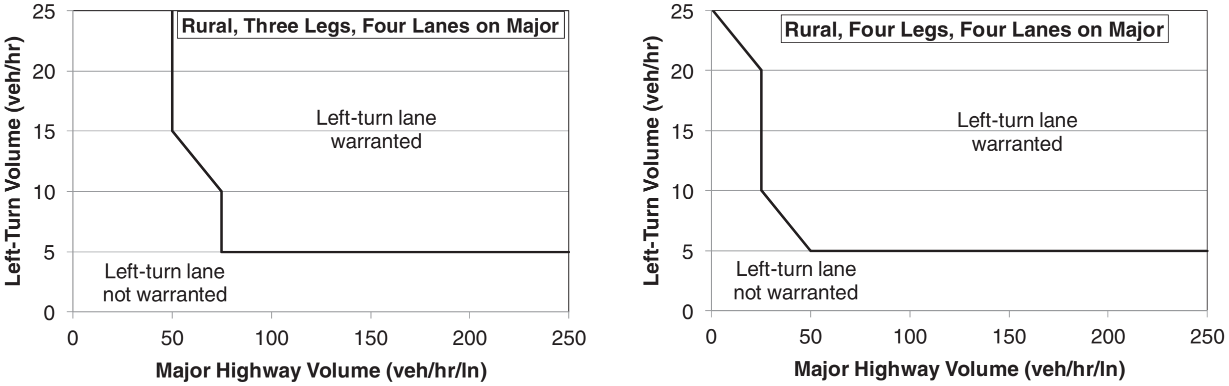


(a) Three Legs (b) Four Legs

Figure 3. Recommended left-turn lane warrants for intersections on rural four-lane highways.

- Crash modification factors available in the AASHTO *Highway Safety Manual* (*4*), and
- Construction costs.

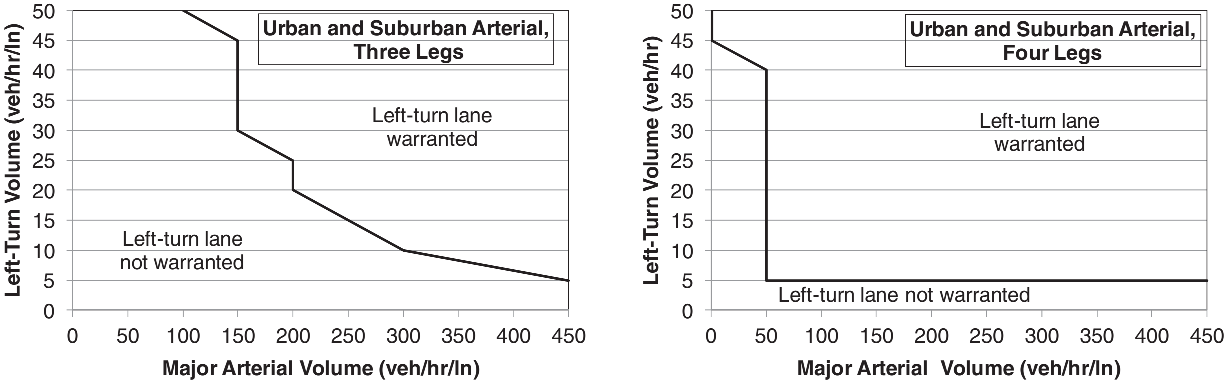
For rural conditions, different safety performance functions are provided for two- and four-lane highways and for three- and four-leg intersections. For urban and suburban arterials, prediction equations are provided for three-leg and four-leg intersections. Separate urban and suburban prediction equations are not provided based on the number of lanes on the major road approach. The prediction equations are not a function of speed limit; therefore, the developed warrants also are not a function of speed limit.

A range of values was used in the benefit-cost evaluation to identify volume conditions when the installation of a left-turn lane at unsignalized intersections and major driveways would be cost-effective. Plots and tables were developed that indicate combinations of major road traffic and left-turn lane volume where a left-turn lane would be recommended. Warrants were developed using the following:

- A range of values for the economic value of a statistical life,
- Crash costs based on values in the *Highway Safety Manual,*
- A range of construction costs, and
- A benefit-cost ratio of 1.0 and 2.0.

The research team suggested a benefit-cost ratio of 1.0 along with the mid-range economic value of a statistical life and moderate construction cost to identify the warrants for a left-turn treatment. For urban and suburban areas, that is a left-turn lane. For rural areas, that is a bypass lane. Benefit-cost ratio of 2.0 has been argued as being a more practical value to use to offset the potential variability in other assumptions. The warrants based on a benefit-cost ratio of 2.0 were selected for a left-turn lane on rural highways. These values were similar to the warrants that resulted when the lower crash costs based on older *Highway Safety Manual* costs were used.

Left-turn lanes can reduce the potential for collisions and improve capacity by removing stopped vehicles from the main travel lane. Left-turn lane warrants were developed as part of NCHRP Project 3-91 using an economic analysis procedure for rural, two-lane highways; rural, four-lane highways; and urban and suburban roadways. The methodology presented in the NCHRP Project 3-91 report (*1*) could also be used if a transportation agency has available local values for delay



(a) Three Legs (b) Four Legs

Figure 4. Recommended left-turn lane warrants for intersections on urban and suburban arterials.

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