Application No.: FLUM-2015-015

Appendix "D"

Transportation/Roadway Analysis

Arc/Treo, LLC

Amending the Future Land Use Map (FLUM) within the Town's Comprehensive Plan from Mixed-Use to Medium Density.

TRAFFIC IMPACT STUDY

For

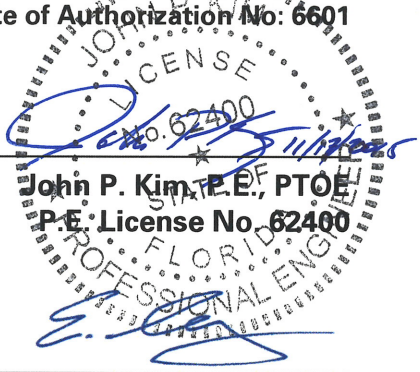
Vista Del Lago
Town of Cutler Bay
Miami-Dade County, Florida

Prepared For:

Lennar Homes LLC
730 NW 107 Avenue
Miami, FL 33172

Prepared By:

Langan Engineering & Environmental Services, Inc.
15150 NW 79 Court
Miami Lakes, FL 33016
FL Certificate of Authorization No: 6601



John P. Kim, P.E., PTOE
P.E. License No. 62400

Eric Schwarz, P.E., LEED AP
Principal/Vice President

November 17, 2015
300188501

LANGAN

Table of Contents

List of Figures

List of Tables

Appendices

EXECUTIVE SUMMARY

Langan was retained by Lennar Homes LLC to prepare a traffic impact analysis for the Vista Del Lago townhome development. The undeveloped site is located at the southwest corner of SW 216th Street and SW 89th Place in the Town of Cutler Bay, Miami-Dade County, Florida. The project consists of 180 townhomes and is expected to be built out in 2018.

Langan estimated the number of additional trips that the project would generate using the equations from the Institute of Transportation Engineer's (ITE), Trip Generation, 9th Edition. The project is expected to increase traffic on the roadway network by approximately 83 new trips (14 enter, 69 exit) during the weekday morning peak hour and 97 new trips (65 enter, 32 exit) during the weekday afternoon peak hour.

We determined the directional distribution of site-generated trips based on the cardinal distribution for the corresponding traffic analysis zone from the Miami-Dade County 2040 Transportation Model and the surrounding roadway network. We conducted capacity analyses for the existing, no build and build conditions at the following intersections:

- Old Cutler Road at SW 216th Street (signalized)
- SW 216th Street at SW 87th Avenue (signalized)
- Old Cutler Road at SW 87th Avenue (roundabout)

All of the analyzed intersections are expected to operate within an acceptable LOS for the 2018 build conditions during the morning and afternoon peak hours. Traffic signal timing modifications were made to the intersection of SW 216th Street and SW 87th Avenue to optimize its operation for the 2018 build condition. Roadway capacity analysis was performed on Old Cutler Road, SW 216th Street and SW 87th Avenue for the morning and afternoon peak hours. These roadways are expected to operate within their adopted LOS for the 2018 build condition.

INTRODUCTION

Lennar Homes LLC retained Langan Engineering and Environmental Services to prepare a traffic impact analysis for the Vista Del Lago (Project) townhome development. The Project is located at the southwest corner of SW 216th Street and SW 89th Place in the Town of Cutler Bay, Miami-Dade County, Florida.

Project Description

The project consists of 180 townhomes and is expected to be built out in 2018. Primary access to the site will be through one driveway connection to SW 216th Street. Figure 1 shows the site location. The site plan is included in Appendix B.

Study Area

We conducted capacity analyses at the following intersections:

- Old Cutler Road at SW 216th Street (signalized)
- SW 216th Street at SW 87th Avenue (signalized)
- Old Cutler Road at SW 87th Avenue (roundabout)

Roadway capacity analysis was performed for the following roadway segments:

- Old Cutler Road between SW 216th Street and SW 87th Avenue
- SW 216th Street between Old Cutler Road and SW 87th Avenue
- SW 87th Avenue between SW 216th Street and Old Cutler Road

An inventory of the physical road conditions is presented in the section "Description of Existing Conditions."

Scope of Study

Langan undertook the following steps to prepare this study in accordance with the methodology accepted by the Town of Cutler Bay and Miami-Dade County.

1. Conducted a series of manual turning movement traffic counts at the intersections identified in the previous section. We conducted counts on a typical weekday from 7:00 am to 9:00 A.M. and 4:00 P.M. to 6:00 P.M.
2. Identified the existing weekday morning and afternoon peak hour traffic volumes based on the manual traffic count data
3. Established 2015 Existing traffic volumes using the obtained turning movement traffic counts
4. Established 2018 No-Build traffic volumes by applying the Florida Department of Transportation (FDOT) peak season conversion factor to existing traffic volumes and a 0.50 percent compound annual growth rate
5. Prepared trip generation estimates for the proposed development based on accepted trip rates developed by the Institute of Transportation Engineers (ITE)
6. Developed trip distribution for the project based on the cardinal distribution for the corresponding Traffic Analysis Zone (TAZ) of the Miami-Dade County 2040 Transportation Model for this location
7. Assigned site-generated trips to the driveways based on likely travel routes motorists will use to travel to and from the site
8. Established future 2018 Build traffic volumes by adding site-generated trips to the 2018 No-Build traffic volumes
9. Performed intersection capacity analyses for the weekday morning and afternoon peak hours using Highway Capacity Software
10. Performed roadway capacity analysis for the weekday morning and afternoon peak hour 2018 Build conditions

A copy of the methodology letter accepted by the Town of Cutler Bay is included in Appendix C. This report presents the database collected by this firm and the traffic analysis of the Project.

DESCRIPTION OF EXISTING CONDITIONS

Langan performed field visits to determine existing conditions of the study intersections and roadways.

Roads

Old Cutler Road

Old Cutler Road is a county maintained arterial roadway under with a northeast/southwest orientation. The roadway is divided and provides one lane in each direction in the vicinity of site. The posted speed limit is 40 MPH. There is curbing and sidewalk along both sides of the roadway.

SW 216th Street

SW 216th Street is a county maintained collector roadway under with an east/west orientation. The roadway is divided and provides two lanes in each direction in the vicinity of the site. The posted speed limit is 30 mph. There is sidewalk and curbing along both sides of the roadway.

SW 87th Avenue

SW 87th Avenue is a county maintained collector roadway with a north/south orientation. The roadway is undivided and provides one lane in each direction in the vicinity of the site. The posted speed limit is 40 mph. There is sidewalk on both sides of the roadway.

Intersections

The two intersections on SW 216th Street are signalized and the intersection of Old Cutler Road and SW 87th Avenue is a roundabout. Field surveys were made to verify the intersection lane configurations. The Miami-Dade County signal timing data for the two signalized intersections are included in Appendix D. Existing intersection lane configurations for the analyzed intersections are shown in Figure 2.

Traffic Volumes

Traffic volume data was obtained through manual turning movement counts conducted on Thursday, November 5, 2015 from 7:00 A.M. to 9:00 A.M. and 4:00 P.M. to 6:00 P.M. at the study intersections. The data was adjusted to reflect peak season volumes using FDOT peak season adjustment factors.

Based on a review of the count data, it was determined that the adjacent weekday morning peak street hour occurs between 7:30 AM and 8:30 AM and the weekday afternoon peak street hour occurs between 5:00 PM and 6:00 PM. Figure 3 illustrates the existing weekday morning and afternoon peak hour traffic volumes. The traffic data and seasonal adjustment factors are contained in Appendix E.

Capacity Analysis

Capacity analysis provides an indication of the adequacy of road facilities to serve traffic demand. The evaluation criteria used to analyze the study area intersections are based on the 2010 Highway Capacity Manual (HCM), published by the Transportation Research Board and the latest version of the Highway Capacity Software (HCS). We conducted capacity analyses for the intersections in the study area and found that the intersections currently operate within an acceptable Level of Service (LOS) during the morning and afternoon peak hours with the exception of the intersection of SW 216th Street and SW 87th Avenue. Table 1 summarizes the existing conditions analysis. The intersection volume development spreadsheets are included in Appendix F. The capacity analyses worksheets are contained in Appendix G.

Table 1 - 2015 Existing Intersection Capacity Analysis Summary

Location	Level of Service		
	A.M.	P.M.	Adopted Standard
Old Cutler Road at SW 216th Street	D	C	D
SW 216th Street at SW 87th Avenue	E	F	D
Old Cutler Road at SW 87th Avenue	D	D	D

FUTURE CONDITIONS

This section of the report covers background traffic growth, site-generated trips, trip distribution, and future traffic volumes. We anticipate the project will be completed by the end of 2018. Accordingly, we projected traffic volumes to include existing traffic and new traffic created by background growth to derive the 2018 No-Build traffic volumes. The site generated trips were added to the 2018 No-Build traffic volumes to derive the 2018 Build traffic volumes.

Background Traffic

The Town of Cutler Bay indicated that there are no approved and unbuilt developments that need to be included in this analysis. Five years of FDOT historical traffic volumes, included in Appendix E, were used to calculate an area growth rate. The calculation resulted in a negative growth rate, so a growth rate of 0.5 percent was used. The existing traffic volumes were increased by a compounded annual growth rate of 0.5 percent to derive the 2018 projected traffic volumes. Figure 4 illustrates the 2018 No-Build traffic volumes. We conducted capacity analyses for the intersections in the study area and found that the intersections are expected to operate within an acceptable LOS during the morning and afternoon peak hours with the exception of the intersection of SW 216th Street and SW 87th Avenue. Table 2 summarizes the No-Build conditions analysis. The capacity analyses worksheets are contained in Appendix G.

Table 2 - 2018 No Build Intersection Capacity Analysis Summary

Location	Level of Service		
	A.M.	P.M.	Adopted Standard
Old Cutler Road at SW 216th Street	D	C	D
SW 216th Street at SW 87th Avenue	E	F	D
Old Cutler Road at SW 87th Avenue	D	D	D

Site-Generated Trips

We prepared daily, morning peak hour and afternoon peak hour vehicle trip estimates for the proposed development using the equations from the 9th Edition of ITE, Trip Generation. The trip generation estimates for the proposed land uses are summarized in Table 3. This project is estimated to generate 83 net new vehicle trips during the morning peak hour and 97 vehicles during the afternoon peak hour. The trip generation analysis is included in Figure 5.

Table 3 - Trip Generation Estimates

Land Use	Daily	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
		In	Out	Total	In	Out	Total
Condominium/Townhomes	1,073	14	69	83	65	32	97

Trip Distribution

We determined the directional distribution of site-generated trips based on the cardinal distribution for the corresponding Traffic Analysis Zone (TAZ) 1362 from the Miami-Dade County 2040 Transportation Model and the surrounding roadway network. The cardinal distributions were adjusted to estimate year 2018 percentages. Table 4 shows the development's trip distributions. Figure 6 shows the arrival and departure distribution assigned to each of the study intersections.

Table 4 - Cardinal Distribution

Year	NNE	ENE	ESE	SSE	SSW	WSW	WNW	NNW
2010	28.10%	6.10%	0.00%	0.00%	2.20%	8.10%	20.60%	35.00%
2040	21.20%	6.20%	0.00%	0.00%	4.40%	20.30%	18.40%	29.40%
2018	**26.26%**	**6.13%**	**0.00%**	**0.00%**	**2.79%**	**11.35%**	**20.01%**	**33.51%**

Build Traffic Volumes

The 2018 Build traffic volumes were derived by adding the total site-generated trips to the 2018 No-Build traffic volumes. Figure 7 illustrates the 2018 Build weekday morning and afternoon peak hour traffic volumes. The intersections are expected to operate within an acceptable LOS during the morning and afternoon peak hours for the 2018 Build conditions with the exception of the intersection of SW 216th Street and SW 87th Avenue. Traffic signal timing modifications were made to achieve an acceptable LOS for this intersection. Signal timing cycle lengths were not changed. Table 5 summarizes the 2018 Build LOS for the weekday morning and afternoon peak hours with the traffic signal timing modifications. The capacity analyses worksheets are contained in Appendix G.

Table 5 - 2018 Build Intersection Capacity Analysis Summary

Location	Level of Service		
	AM	PM	Adopted Standard
Old Cutler Road at SW 216th Street	D	C	D
SW 216th Street at SW 87th Avenue	D*	D*	D
Old Cutler Road at SW 87th Avenue	D	D	D

**Results based on modified signal timing*

Driveway Analysis

The project driveway intersection was analyzed for 2018 Build conditions and is expected to operate at LOS B during the peak hours. Figure 8 shows the project traffic volumes for the driveway intersection. This project proposes a full median opening on SW 216th Street and an exclusive left-turn lane for the project's driveway. The number of eastbound vehicles that are expected to turn right at the project driveway during the peak hour is 44. The 2008 FDOT driveway information guide recommends right-turn deceleration lanes for driveways where the number of right-turns is 80 or more. Therefore, a right-turn deceleration lane is not required.

Roadway Capacity Analysis

Two-way roadway volumes were derived from the intersection count data. The volumes were adjusted by the seasonal adjustment factor and an annual growth rate to develop 2018 volumes. Project trips were added to develop 2018 total traffic volumes. Table 6 summarizes the results of the capacity analysis and indicates that the roadways will operate within their adopted LOS for the 2018 Build conditions.

Table 6 - 2018 Peak Hour Roadway Capacity Analysis Summary

Roadway	From	To	LOS D Capacity	Peak Hour	2015 Volume	2018 Volume	Project Trips	2018 Total Traffic	Meets Capacity
Old Cutler Road	SW 216 St.	SW 87 Ave.	1,330	A.M.	1,159	1,176	8	1,184	Yes
			1,330	P.M.	1,254	1,273	10	1,283	Yes
SW 216th Street	Old Cutler Rd.	SW 87 Ave.	2,920	A.M.	1,052	1,068	56	1,124	Yes
			2,920	P.M.	1,101	1,118	67	1,185	Yes
SW 87th Avenue	SW 216 St.	Old Cutler Rd.	1,330	A.M.	964	979	23	1,002	Yes
			1,330	P.M.	1,030	1,046	27	1,073	Yes

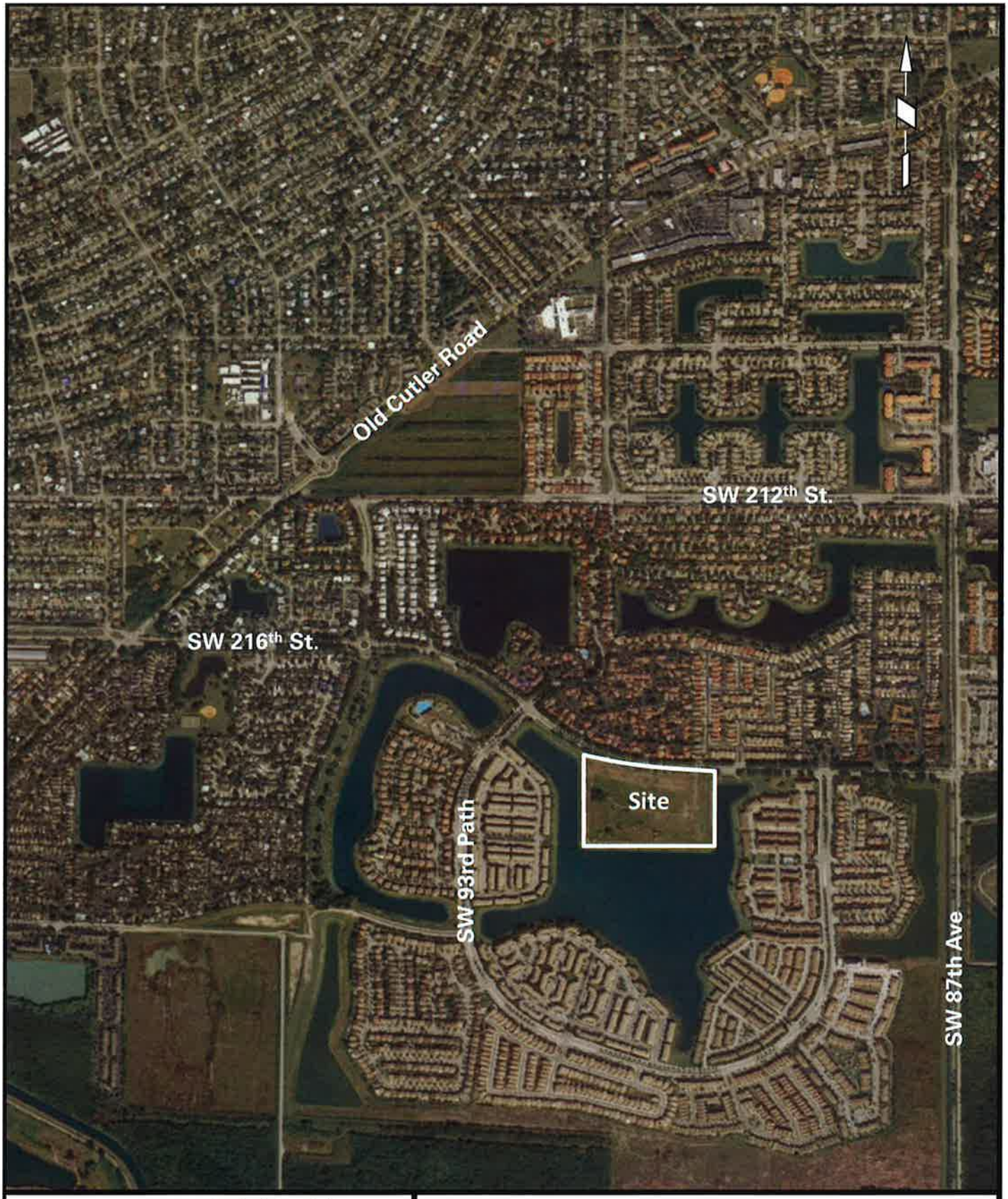
ALTERNATIVE TRANSPORTATION MODES

A Miami-Dade Transit (MDT) bus stop is located at the southeast corner of SW 216th Street and SW 92nd Avenue, less than 1,000 feet west of the Project. Route 287 of the MDT Metrobus system and the Cutler Bay Town Circulator provide service to this stop. The site plan shows a network of pedestrian walkways throughout the development and includes eight sidewalk connections to the existing sidewalk on SW 216th Street. The project will provide parking for 36 bicycles within the development.

CONCLUSIONS

Langan performed a traffic impact analysis for the Vista Del Lago townhome development. The project is expected to be built out in 2018. Morning and afternoon peak hour intersection capacity analysis was performed for the study intersections and the project driveway intersection. The analysis shows that all of the study intersections and roadways will operate at an acceptable LOS for the 2018 build out conditions.

APPENDIX A
FIGURES



LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES
15150 NW 79th Court, Suite 200 Miami Lakes, FL 33016
P: 786.264.7221 F: 786.264.7201
www.langan.com
FLORIDA PENNSYLVANIA NEW YORK NEW JERSEY CONNECTICUT

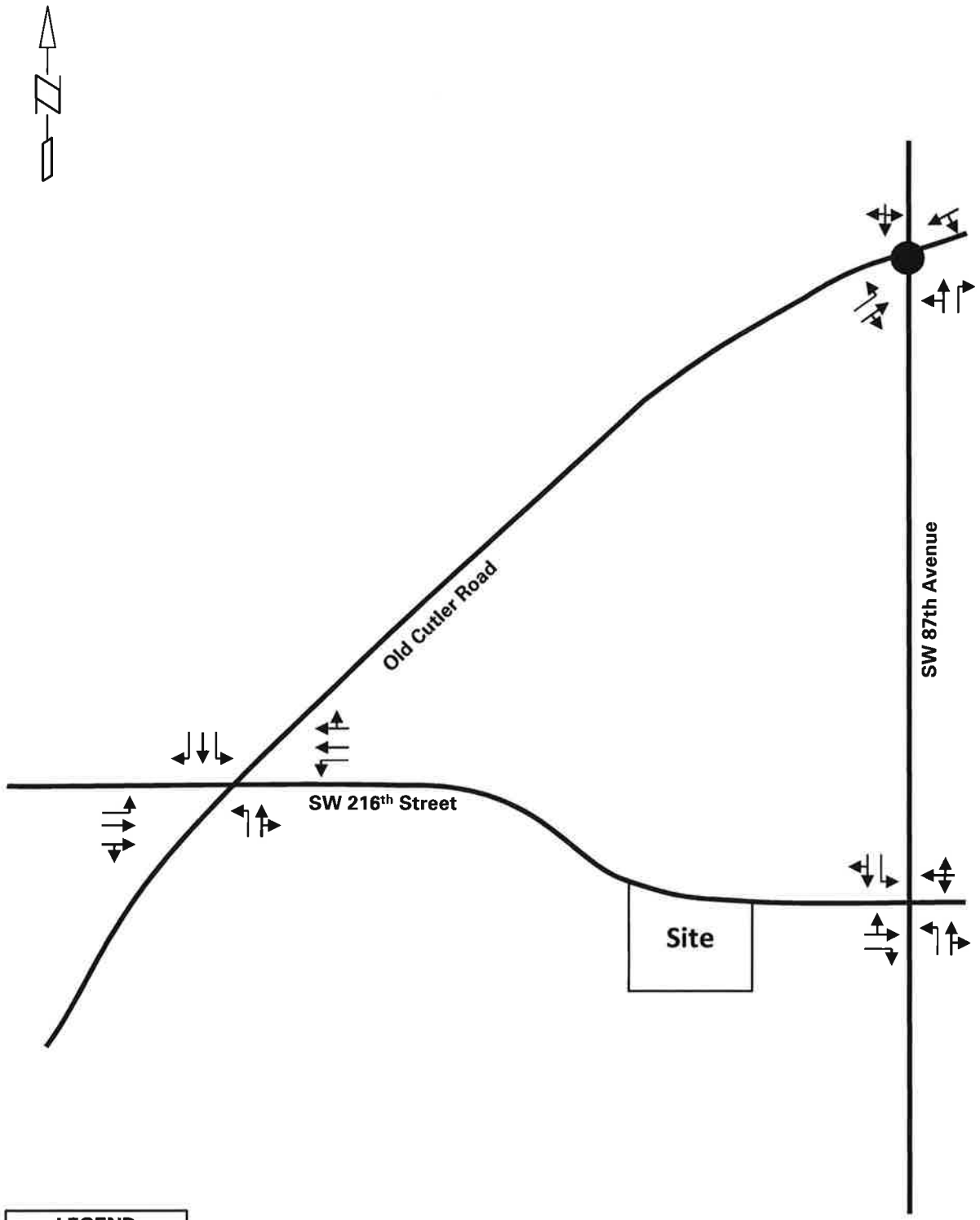
Vista Del Lago

Site Location Map

Town of Cutler Bay

Miami-Dade County Florida

Project No.	Date	Scale	
300188501	11/12/2015	Not to Scale	Figure 1



LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES
15150 NW 79th Court, Suite 200 Miami Lakes, FL 33016
P: 786.264.7221 F: 786.264.7201
www.langan.com
FLORIDA PENNSYLVANIA NEW YORK NEW JERSEY CONNECTICUT

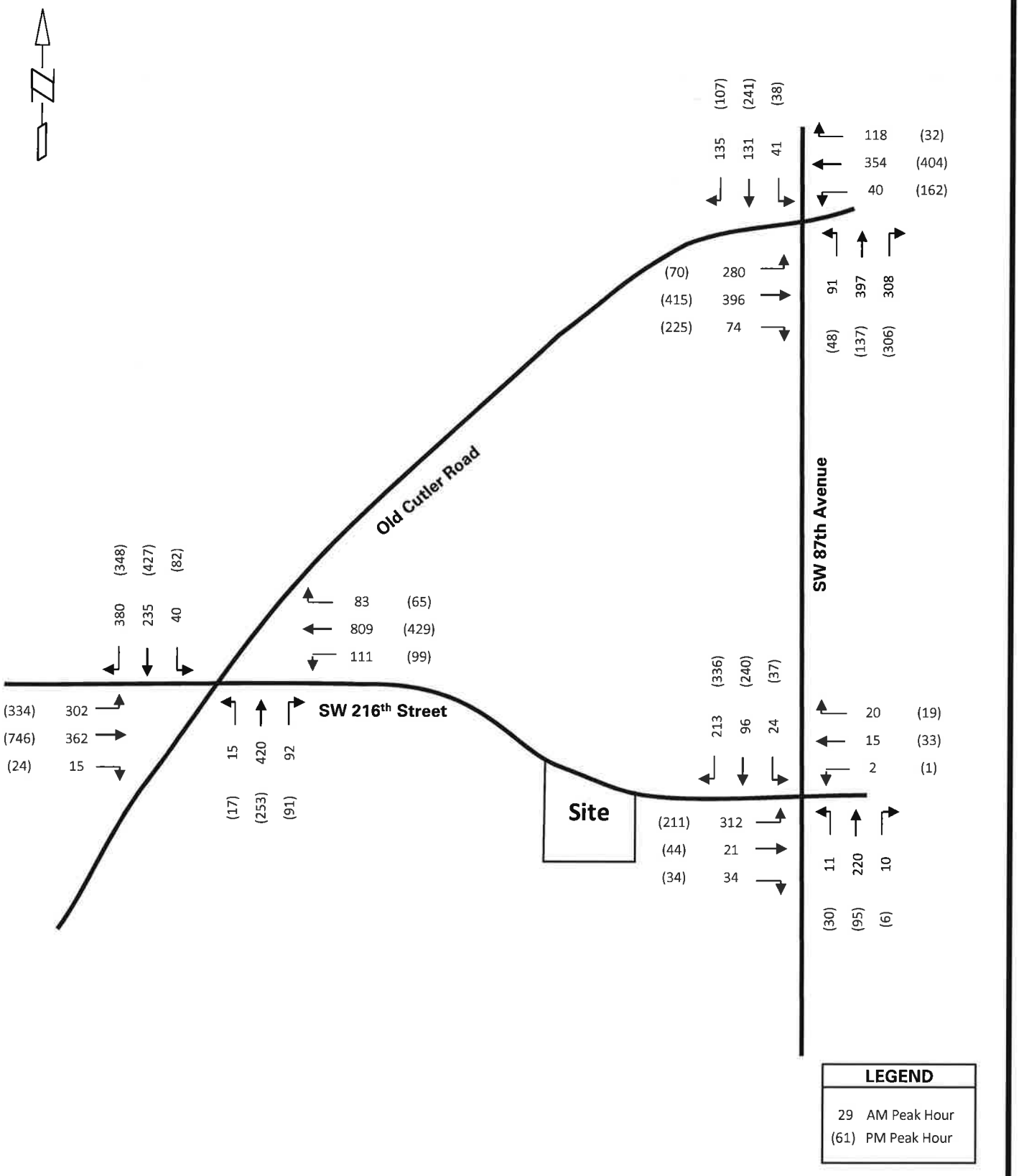
Vista Del Lago

Intersection Lane Configurations

Town of Cutler Bay

Miami-Dade County Florida

Project No.	Date	Scale	
300188501	11/12/2015	Not to Scale	Figure 2



LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES
15150 NW 79th Court, Suite 200 Miami Lakes, FL 33016
P: 786.264.7221 F: 786.264.7201
www.langan.com
FLORIDA PENNSYLVANIA NEW YORK NEW JERSEY CONNECTICUT

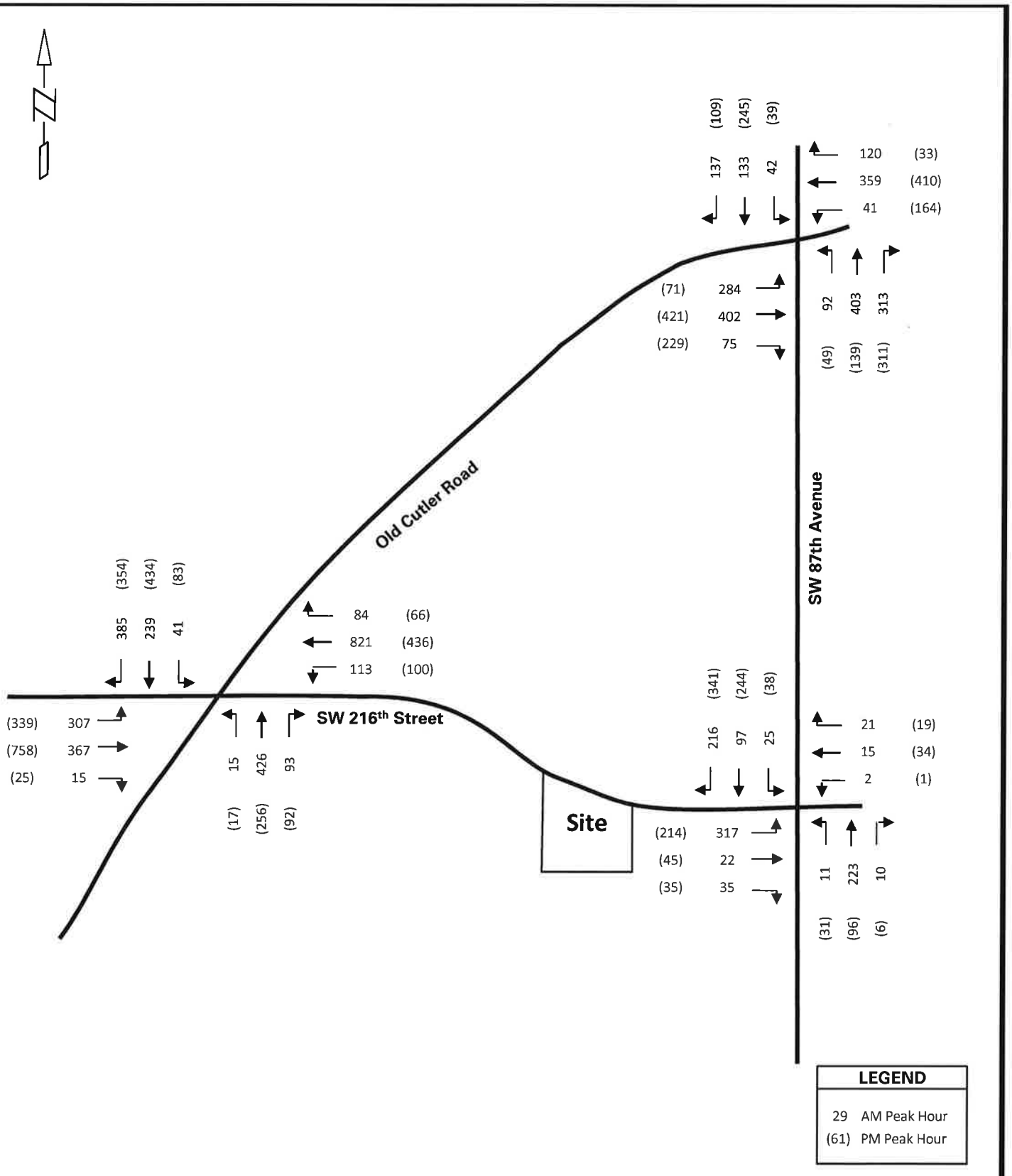
Vista Del Lago

2015 Existing Peak Hour Traffic Volumes

Town of Cutler Bay

Miami-Dade County Florida

Project No.	Date	Scale	
300188501	11/12/2015	Not to Scale	Figure 3



LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES
15150 NW 79th Court, Suite 200 Miami Lakes, FL 33016
P: 786.264.7221 F: 786.264.7201
www.langan.com
FLORIDA PENNSYLVANIA NEW YORK NEW JERSEY CONNECTICUT

Vista Del Lago

2018 No Build TrafficVolumes

Town of Cutler Bay

Miami-Dade County Florida

Project No.	Date	Scale	
300188501	11/12/2015	Not to Scale	Figure 4

FIGURE 3 - TRIP GENERATION ESTIMATES
VISTA DEL LAGO

DAILY

Land Use	ITE Code	Intensity	Trip Generation Rate	In	Out	Total Trips		
						In	Out	Total
Condominium/Townhomes	230	180 DU	T = 0.87 Ln(X) + 2.46	50%	50%	537	536	1,073

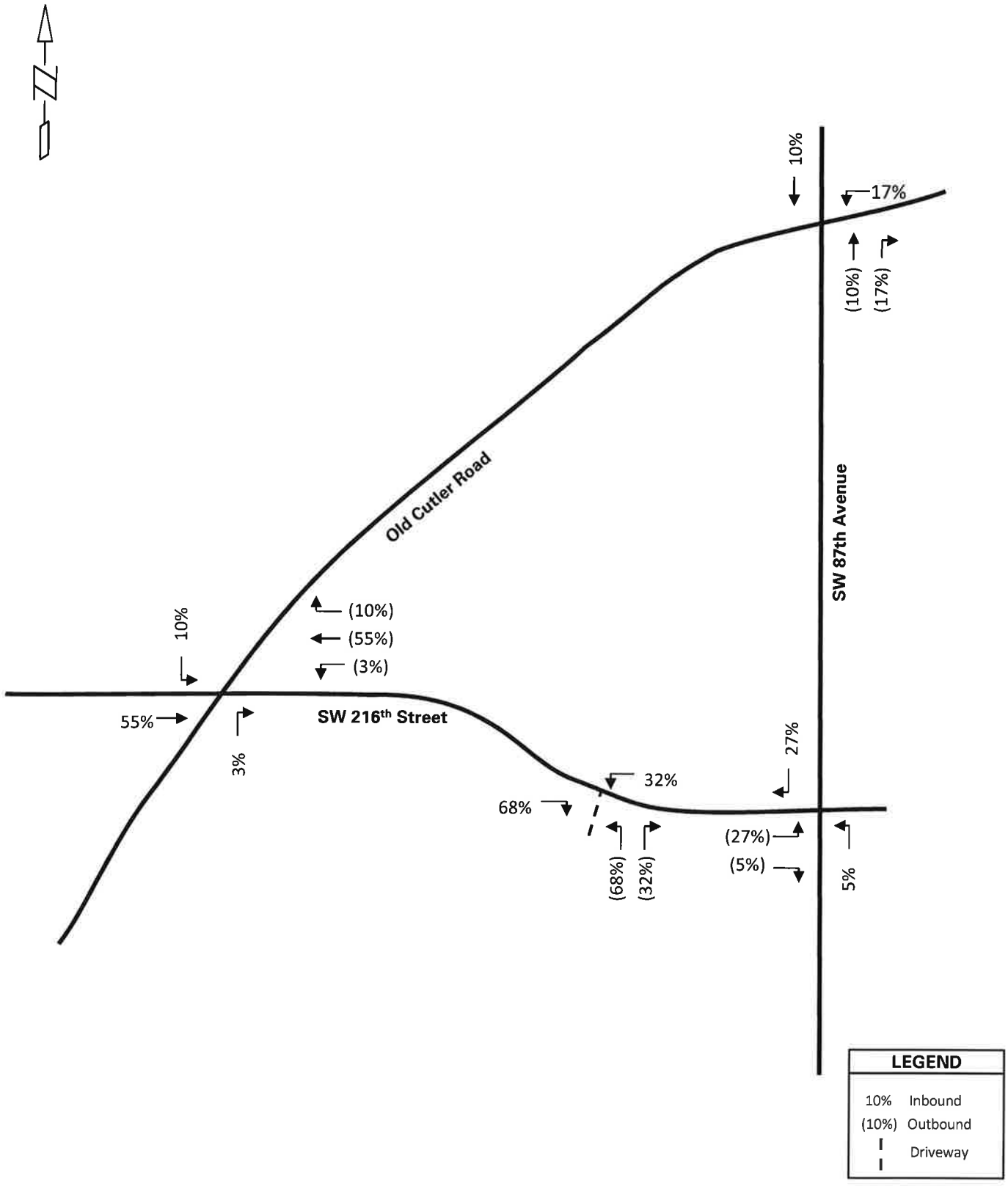
MORNING PEAK HOUR

Land Use	ITE Code	Intensity	Trip Generation Rate	In	Out	Total Trips		
						In	Out	Total
Condominium/Townhomes	230	180 DU	T= 0.8 Ln(X) + 0.26	17%	83%	14	69	83

AFTERNOON PEAK HOUR

Land Use	ITE Code	Intensity	Trip Generation Rate	In	Out	Total Trips		
						In	Out	Total
Condominium/Townhomes	230	180 DU	T= 0.82 Ln(X) + 0.32	67%	33%	65	32	97

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES



LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES
15150 NW 79th Court, Suite 200 Miami Lakes, FL 33016
P: 786.264.7221 F: 786.264.7201
www.langan.com
FLORIDA PENNSYLVANIA NEW YORK NEW JERSEY CONNECTICUT

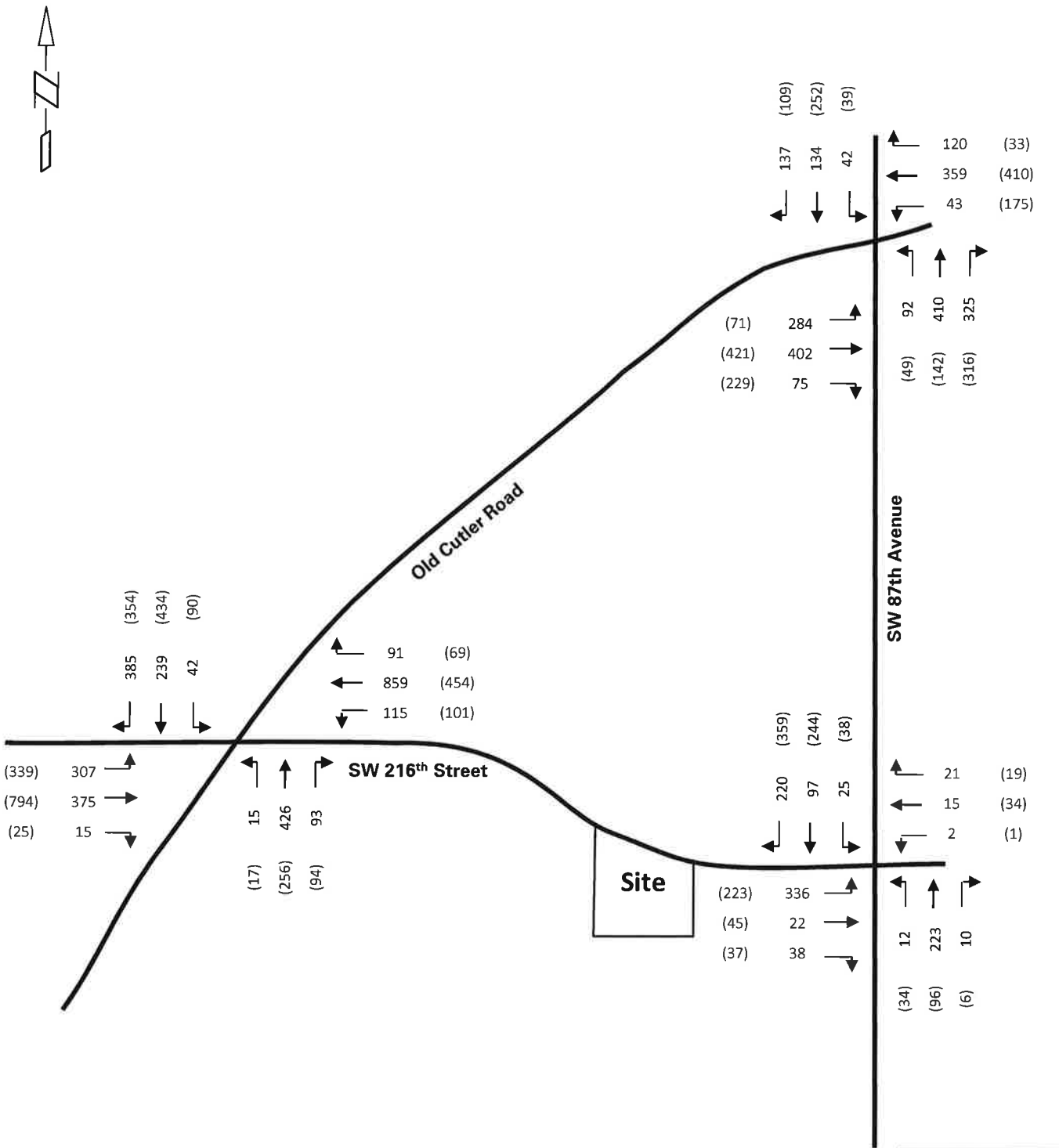
Vista Del Lago

Project Trip Distribution

Town of Cutler Bay

Miami-Dade County Florida

Project No.	Date	Scale	
300188501	11/12/2015	Not to Scale	Figure 6



LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES
15150 NW 79th Court, Suite 200 Miami Lakes, FL 33016
P: 786.264.7221 F: 786.264.7201
www.langan.com
FLORIDA PENNSYLVANIA NEW YORK NEW JERSEY CONNECTICUT

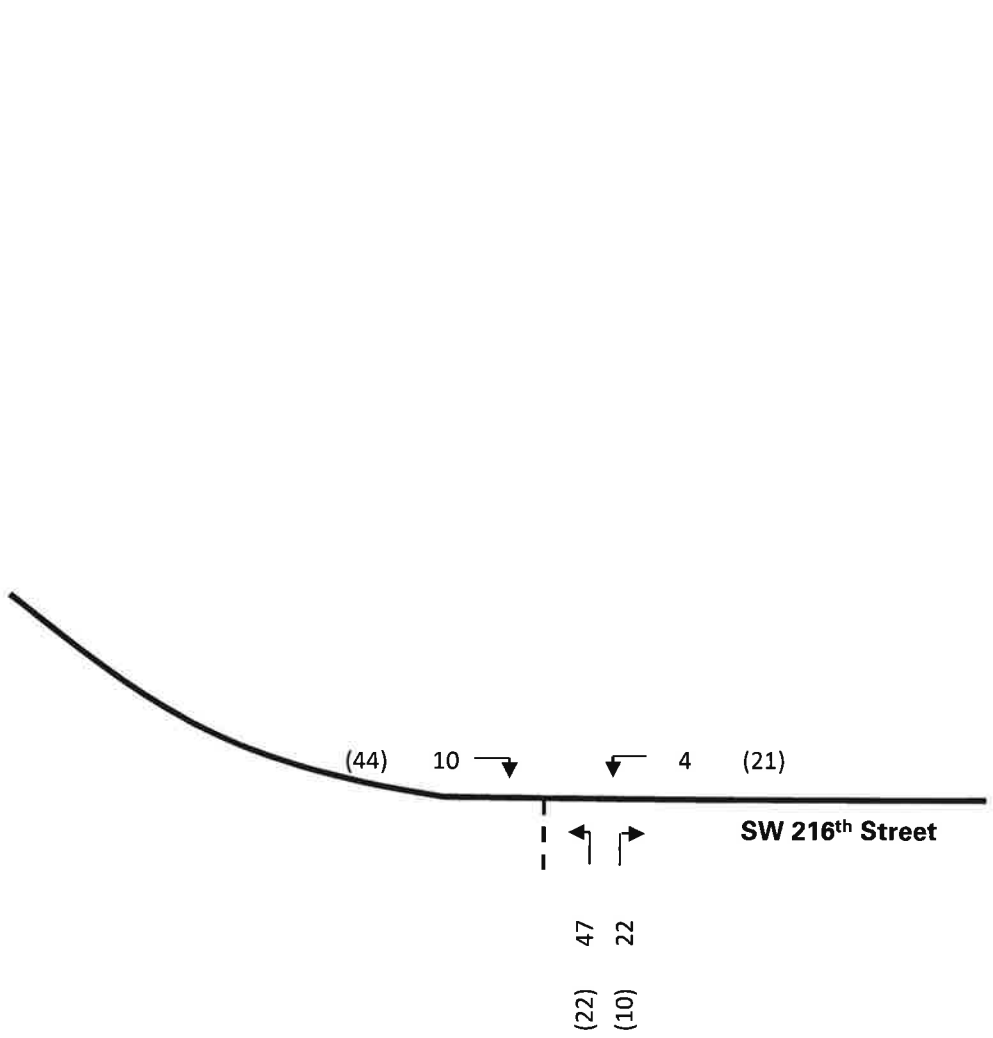
Vista Del Lago

2018 Build Traffic Volumes

Town of Cutler Bay

Miami-Dade County Florida

Project No.	Date	Scale	
300188501	11/12/2015	Not to Scale	Figure 7



LEGEND	
29	AM Peak Hour
(61)	PM Peak Hour
	Driveway

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES
15150 NW 79th Court, Suite 200 Miami Lakes, FL 33016
P: 786.264.7221 F: 786.264.7201
www.langan.com
FLORIDA PENNSYLVANIA NEW YORK NEW JERSEY CONNECTICUT

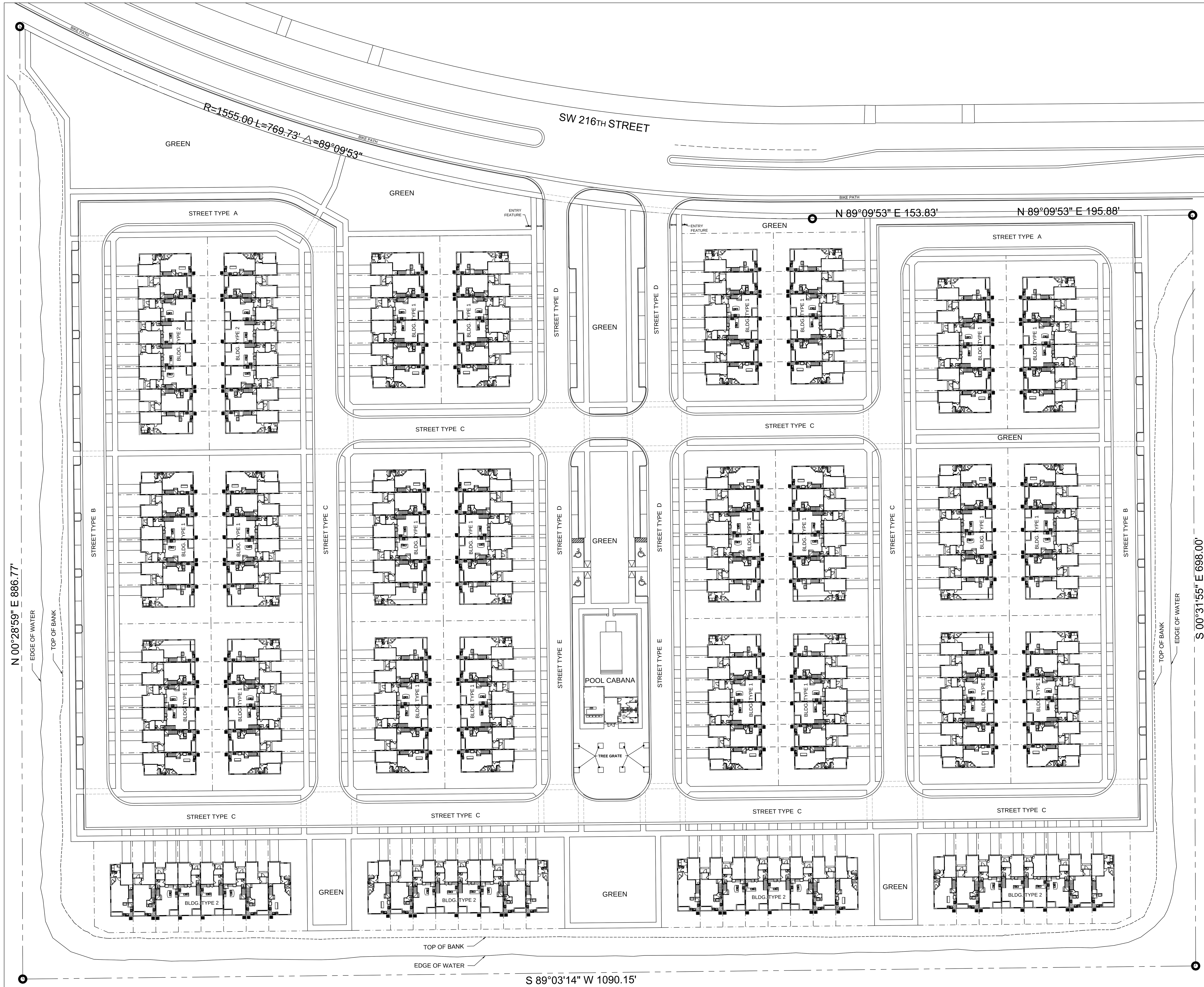
Vista Del Lago

Driveway Volumes
Town of Cutler Bay

Miami-Dade County Florida

Project No.	Date	Scale	
300188501	11/12/2015	Not to Scale	Figure 8

APPENDIX B
SITE PLAN



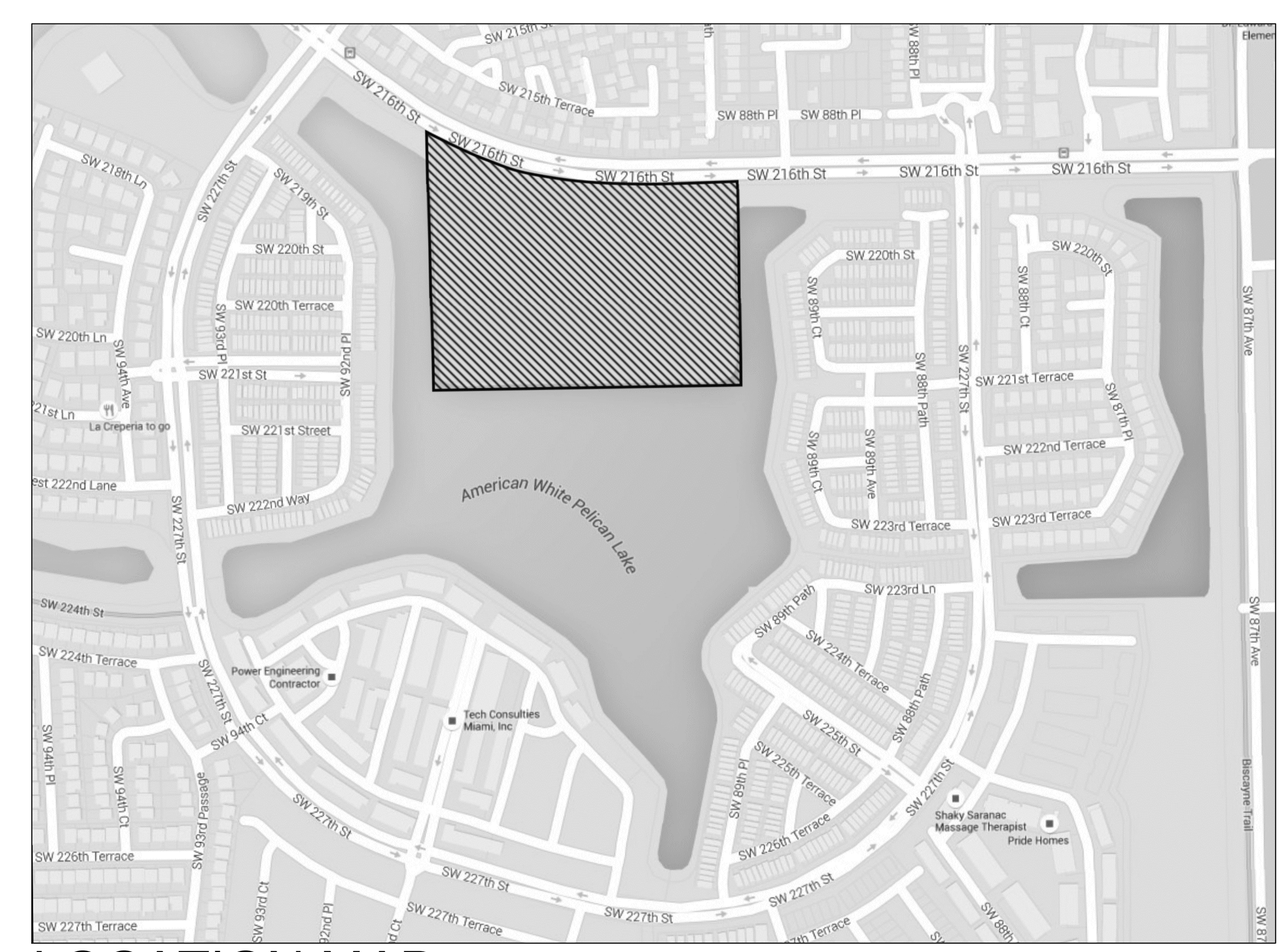
GENERAL SITE PLAN SCALE:1"=50'

SITE DATA TABLE

ZONING:		Existing	Proposed
		NC-2	**MR-13**
TOTAL SITE AREA:			**18.57 acres**
TOTAL DWELLING:			**180 units**
FLOOR AREA RATO:		Maximum	Proposed
		4	**0.45**
DENSITY:		Allowed	Proposed
		10	**9.69 units/acre**
BUILDING HEIGHT:		Maximum	Proposed
		3 stories(45')	**2 stories (29'-10")**
BUILDING SETBACK(Each Townhouse Lot):		Minimum	Proposed
	Front Yard	20'	**20'**
	Street Side Yard	15'	**15'**
	Interior Side Yard	15'	**15'**
	Rear Yard	25'	**15'**
SPACING BETWEEN BUILDINGS:		Minimum	Proposed
		25'	**30'**
IMPERVIOUS SURFACE COVERAGE:		Maximum	Proposed
		12.07 acres(65%)	**11.60acres (62.47 %)**
LOT WIDTH		Minimum	Proposed
		25'-0"	**21'-0"**
LOT AREA		Minimum	Proposed
		1,500 sq.ft.	**1,785 sq.ft.**
OPEN SPACE:		Minimum	Proposed
	Landscaped	6.50 acres(35%)	**6.97acres (37.53 %)**
	Common	3.71 acres(20%)	**4.29 (23.10 %)**
DWELLING UNIT :			
	Townhouse		**180**units
UNIT SIZE :		Minimum	Proposed
	3 Bedroom	1,000 sq.ft.	**1,546 sq.ft.**
ACCESSORY STRUCTURE SETBACK:		Minimum	Proposed
	(only permitted in rear yard)	2.5'	n/a
COMMON RECREATIONAL FACILITY SETBACK:		Minimum	Proposed
	Front Yard	50	**374'**
	Street Side Yard	15'	**n/a**
	Interior Side Yard	15'	**517'**
	Rear Yard	20	**229'**

PARKING CALCULATION:

			Required	Provided off-street	Provided on-street	Sub-total
Townhouse:	180 units	x2.00 =	360	360		**360**
Guest:					51	**51**
handicapped:					4	**4**
		Total Required:	360	Total Provided:		**415**



LOCATION MAP N.T.S.

VALLE VALLE INC.

Valle Valle and Partners
194 Minorca Ave.
Coral Gables, Fl 33134
305.476.9212
305.476.9219
www.urbanism.com

CLIENT / OWNER:

LENNAR CORPORATION
730 NW 107th Ave., 3rd Fl.Miami, FL 33146
305.559.1951

CONSULTANTS:

SURVEYOR:
Ford Engineers
1950 NW 94th Ave., 2nd Floor
Miami, Fl 33172
305.477.6472

CIVIL ENGINEER:
Ford Engineers
1950 NW 94th Ave., 2nd Floor
Miami, Fl 33172
305.477.6472

LANDSCAPE ARCHITECT:
Witkin Hults Design Group
307 South 21st Ave.
Hollywood, Fl 33020
954.923.9681

PROJECT:

VISTA DEL LAGO
Cutler Bay, Florida

REVISIONS

DATE: 09-23-15

DISCIPLINE / SHEET TITLE:

SCALE: AS SHOWN

SHEET NO:

AS- 01

APPENDIX C
METHODOLOGY LETTER

30 October 2015

Mr. Eric Czerniejewski, P.E.
Calvin, Giordano & Associates, Inc.
1800 Eller Drive, Suite 600
Fort Lauderdale, Florida 33316

Re: Traffic Analysis Methodology
Vista Del Lago
Cutler Bay, Florida

Dear Mr. Czerniejewski:

Please accept this letter as the proposed traffic impact analysis methodology for the Vista Del Lago, 180-unit townhome residential development. The project will be located directly south of SW 216th Street at theoretical SW 90th Avenue in the Town of Cutler Bay. A copy of the preliminary site plan is included as Attachment 1. **Figure 1** below shows the site location. Langan Engineering and Environmental Services, Inc. (Langan) has been retained to prepare a traffic impact study for this project. We propose the following methodology.

Figure 1 – Aerial Photograph

Trip Generation

Trip generation will be based on information contained in the Institute of Transportation Engineer's (ITE), Trip Generation Manual, 9th Edition. Land Use Code 230 Residential Condominium and Townhouse will use to estimate the project's trip generation. Table 1 below summarizes the trip generation analysis. The 180 townhomes are expected to generate 1,073 daily, 83 morning peak hour and 97 afternoon peak hour trips as summarized in Table 1 below

Table 1 - Trip Generation Estimates

LAND USE	Daily	Peak Hour			Peak Hour		
		In	Out	Total	In	Out	Total
Condominium/Townhomes	1,073	14	69	83	65	32	97

Data Collection

Morning and afternoon peak hour turning movement data will be collected on a typical weekday at the following intersections:

- SW 216th Street at Old Cutler Road (signalized)
- SW 216th Street at SW 87th Avenue (signalized)
- SW 87th Avenue at Old Cutler Road (roundabout)

Data will be collected for four hours between 7:00 and 9:00 AM and between 4:00 and to 6:00 PM and will be adjusted to reflect peak season peak hour traffic volumes by applying a peak season, conversion factor obtained from the *Florida Department of Transportation (FDOT) Peak Season Factor Category Report* available online.

Project Distribution

Project trip distribution will be based on the cardinal distribution for Traffic Analysis Zone 1362 of the Miami-Dade County 2040 Transportation Model. Table 2 below shows the interpolated cardinal distribution based on a 2017 build out year. Attachment 2 is an aerial photograph that shows the prosed project distribution.

Table 2 - Cardinal Distribution

Year	NNE	ENE	ESE	SSE	SSW	WSW	WNW	NNW
2010	28.10%	6.10%	0.00%	0.00%	2.20%	8.10%	20.60%	35.00%
2040	21.20%	6.20%	0.00%	0.00%	4.40%	20.30%	18.40%	29.40%
2017	**26.49%**	**6.12%**	**0.00%**	**0.00%**	**2.71%**	**10.95%**	**20.09%**	**33.69%**

Future Traffic

Future traffic volumes will be developed by applying a compound growth rate to the collected traffic data. The growth rate will be based on a five years of FDOT historical data from traffic count stations in the vicinity of the project. A one-half percent annual growth rate will be used if a negative growth rate is determined. Traffic from approved unbuilt developments will be included in the analysis.

Intersection Analysis
Intersection capacity analysis will be performed for the study intersections and the proposed driveway connection using software based on the Highway Capacity Manual (HCM) methodology. The analysis will be performed for morning and afternoon peak hour conditions using the HCS or Synchro Software. The analysis scenarios will include the existing year (2015) and build out year (2017).

Roadway Link Analysis
Link capacity analysis will be performed using the LOS criteria outlined in the town's code of ordinances. Morning and afternoon peak hour link volumes will be derived from intersection data for the following roadways:

- Old Cutler Road from SW 216th Street to SW 87th Avenue
- SW 216th Street from Old Cutler Road to SW 87th Avenue
- SW 87th Avenue from SW 216th Street to Old Cutler Road

Report
The study methodology, analysis and findings will be summarized in a report that will be signed and sealed by a Florida registered professional engineer. The report will address multimodal improvements and coordination with Miami-Dade County and FDOT as necessary.

A copy of this methodology letter will be provided to the Miami-Dade County Traffic Engineering Division after it is approved. If you have any questions regarding the information contained herein, please do not hesitate to contact me at (786) 264-7226.

Sincerely,

Langan Engineering and Environmental Services, Inc.

John P. Kim, P.E., PTOE
Senior Project Manager

Eric Schwarz, P.E., LEED AP
Principal/Vice President

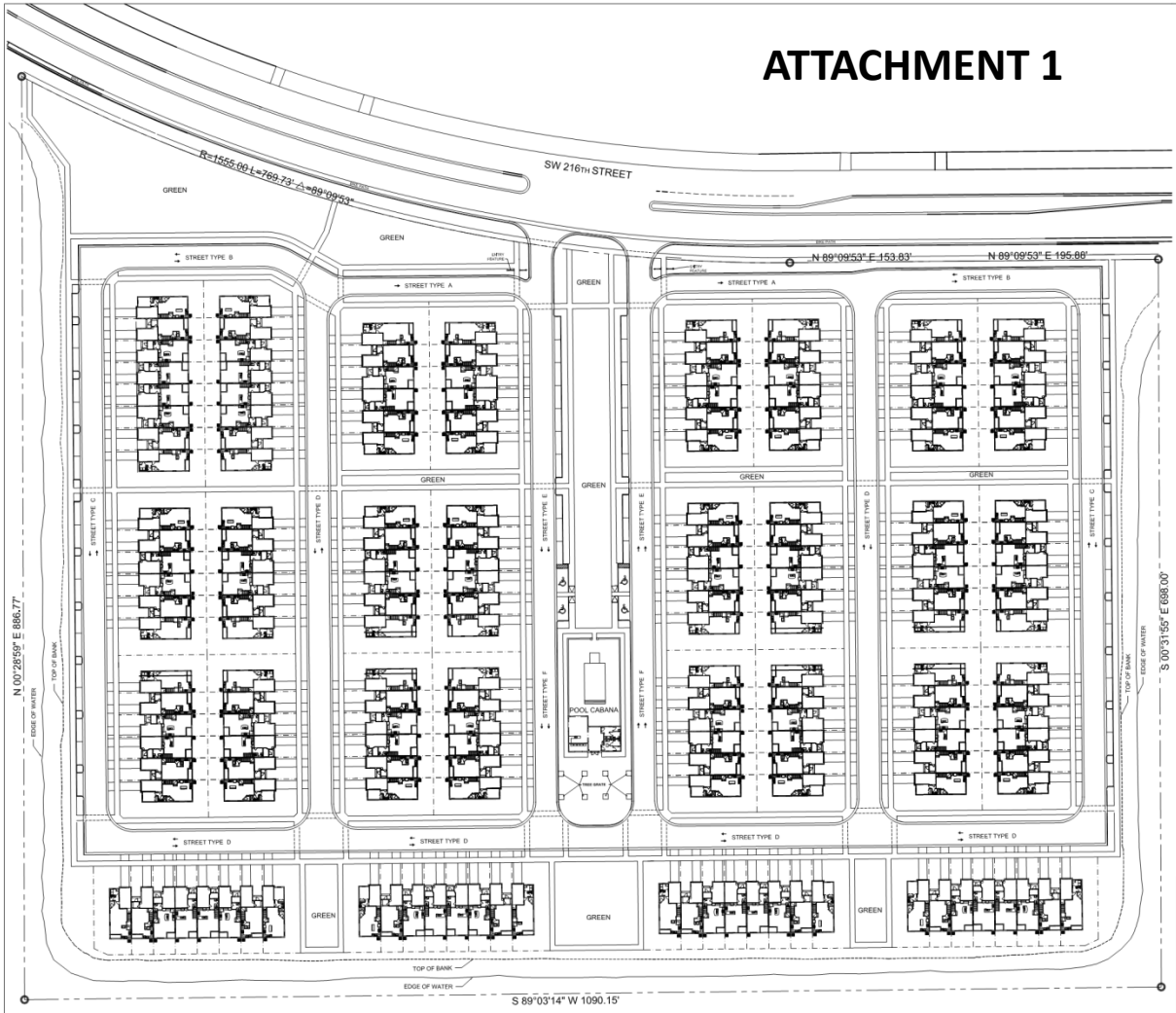
Attachments
Attachment 1 – Preliminary Site Plan
Attachment 2 – Project Distribution

Cc: Mohammad Khan, P.E., PTP, PTOE

Florida Certificate of Authorization No. 6601

C:\JPK\Langan\Lennar Vista Del Lago\2015-10-30 Vista Del Lago Traffic Methodology.docx

ATTACHMENT 1



GENERAL SITE PLAN SCALE:1"=50'

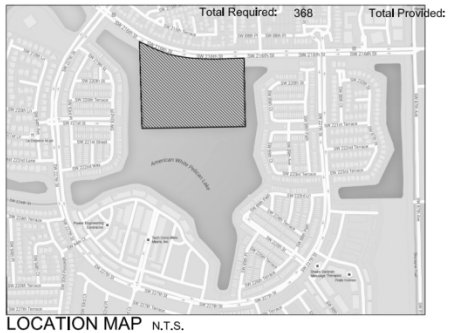
SITE DATA TABLE

ZONING:		Existing	Proposed
		NC-2	**MR-13**
TOTAL SITE AREA:			**18.57 acres**
TOTAL DWELLING:			**180 units**
FLOOR AREA RATO:		Maximum	Proposed
		4	**0.45**
DENSITY:		Allowed	Proposed
		10	**9.69 units/acre**
BUILDING HEIGHT:		Maximum	Proposed
		3 stories(45')	**2 stories (29'-10")**
BUILDING SETBACK(Each Townhouse Lot):		Minimum	Proposed
	Front Yard	20'	**20'**
	Street Side Yard	15'	**15'**
	Interior Side Yard	15'	**15'**
	Rear Yard	25'	**15'**
SPACING BETWEEN BUILDINGS:		Minimum	Proposed
		25'	**30'**
IMPERVIOUS SURFACE COVERAGE:		Maximum	Proposed
		12.07 acres(65%)	**11.45acres (61.66 %)**
LOT WIDTH		Minimum	Proposed
		25'-0"	21'-0"
LOT AREA		Minimum	Proposed
		1,500 sq.ft.	1,785 sq.ft.
OPEN SPACE:		Minimum	Proposed
	Landscaped	6.50 acres(35%)	**7.12 (38.34 %)**
	Common	3.71 acres(20%)	4,39acres **(23.64 %)**
DWELLING UNIT :			
	Townhouse		180units
UNIT SIZE :		Minimum	Proposed
	3 Bedroom	1,000 sq.ft.	1,546 sq.ft.
ACCESSORY STRUCTURE SETBACK:		Minimum	Proposed
	(only permitted in rear yard)	2.5'	n/a
COMMON RECREATIONAL FACILITY SETBACK:		Minimum	Proposed
	Front Yard	50	374'
	Street Side Yard	15'	n/a
	Interior Side Yard	15'	517'
	Rear Yard	20	229'

PARKING CALCULATION:

			Required	off-street	Provided on-street	Sub-total
Townhouse:	180 units	x2.00 =	360	360		**360**
Guest:			n/a		72	**72**
handicapped:			8		8	**8**

Total Required: 368 Total Provided: **440**



LOCATION MAP N.T.S.

VALLE VALLE INC.

Valle Valle and Partners
194 Minorca Ave,
Coral Gables, Fl 33134
305.476.9212
305.476.9219
www.urbanism.com

CLIENT / OWNER:

ARC TREO
2950 SW 27th Avenue, Suite 300
MIAMI, FL 33133
305.xxx.xxx

CONSULTANTS:

SURVEYOR:
Ford Engineers
1950 NW 94th Ave., 2nd Floor
Miami, Fl 33172
305.477.6472

CIVIL ENGINEER:
Ford Engineers
1950 NW 94th Ave., 2nd Floor
Miami, Fl 33172
305.477.6472

LANDSCAPE ARCHITECT:
Within Hults Design Group
307 South 21st Ave,
Hollywood, Fl 33020
954.823.9681

PROJECT:

VISTA DEL LAGO
Cutler Bay, Florida

REVISIONS

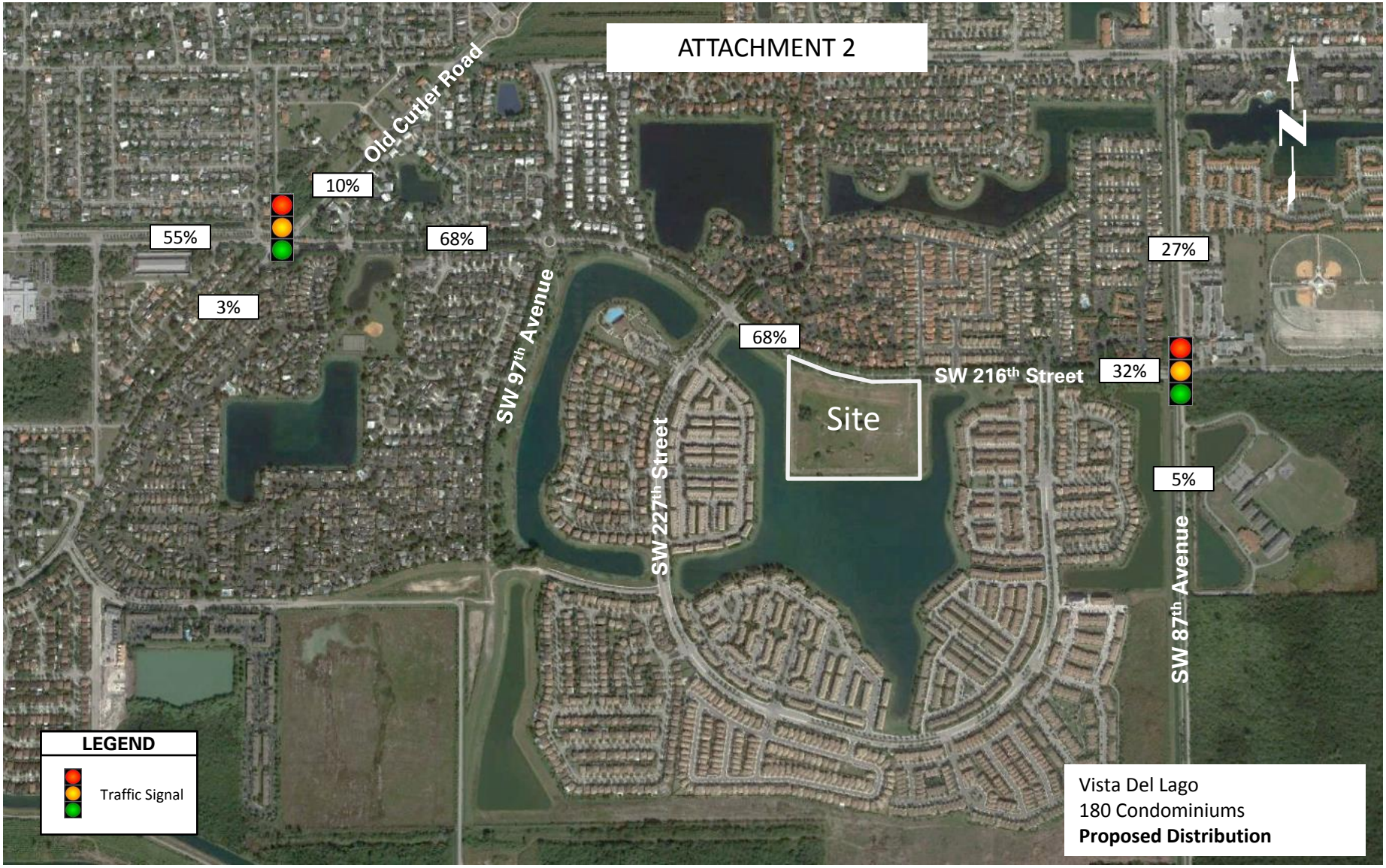
DATE: 03-27-15

DISCIPLINE / SHEET TITLE:

SCALE: AS SHOWN

SHEET NO.

AS- 01


ATTACHMENT 2
Old Cutler Road
SW 97th Avenue
SW 227th Street
SW 216th Street
SW 87th Avenue
Site
10%
55%
68%
3%
68%
27%
32%
5%
LEGEND
Traffic Signal
Vista Del Lago
180 Condominiums
Proposed Distribution

APPENDIX D
SIGNAL TIMING DATA

TOD Schedule Report

for 4184: Old Cutler Rd&SW 216 St

Print Date: 3/5/2014

Print Time: 8:24 AM

Asset	Intersection	TOD Schedule	Op Mode	Plan #	Cycle	Offset	TOD Setting	Active PhaseBank	Active Maximum
4184	Old Cutler Rd&SW 216 St	DOW-4		N/A	0	0	N/A	0	Max 0

Splits

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

Active Phase Bank: Phase Bank 1

Phase	Walk Phase Bank 1 2 3	Don't Walk 1 2 3	Min Initial 1 2 3	Veh Ext 1 2 3	Max Limit 1 2 3	Max 2 1 2 3	Yellow	Red
1 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
2 SBT	0 - 0 - 0	0 - 0 - 0	16 - 16 - 16	1 - 1 - 1	35 - 35 - 40	0 - 50 - 43	5	1.1
3 EBL	0 - 0 - 0	0 - 0 - 0	5 - 5 - 5	2 - 4 - 2	7 - 20 - 15	15 - 25 - 20	4	0
4 WBT	0 - 0 - 0	0 - 0 - 0	7 - 7 - 7	3.5 - 3.5 - 2.5	25 - 30 - 25	40 - 47 - 22	4	0.5
5 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
6 NBT	0 - 0 - 0	0 - 0 - 0	16 - 16 - 16	1 - 1 - 1	35 - 35 - 40	0 - 50 - 43	5	1.1
7 WBL	0 - 0 - 0	0 - 0 - 0	5 - 5 - 5	2 - 2 - 2	7 - 20 - 15	15 - 25 - 20	4	0
8 EBT	0 - 0 - 0	0 - 0 - 0	7 - 7 - 7	3.5 - 3.5 - 2.5	25 - 30 - 25	40 - 47 - 22	4	0.5

Last In Service Date: unknown

Permitted Phases

	12345678
Default	-234-678
External Permit 0	--------
External Permit 1	-2-4-6-8
External Permit 2	-2-4-6-8

Current TOD Schedule	Plan	Cycle	Green Time 1	2	3	4	5	6	7	8	Ring Offset	Offset
			-	SBT	EBL	WBT	-	NBT	WBL	EBT		
	2	90	0	30	9	36	0	30	9	36	0	0
	4	110	0	38	19	38	0	38	9	48	0	0
	6	80	0	40	6	19	0	40	6	19	0	0
	9	90	0	40	14	21	0	40	14	21	0	0
	12	110	0	45	14	36	0	45	14	36	0	0
	19	90	0	50	6	19	0	50	6	19	0	0
	20	80	0	40	6	19	0	40	6	19	0	0
	21	90	0	39	14	22	0	39	14	22	0	0

Local TOD Schedule

Time	Plan	DOW
0000	Flash	M T W Th F
0000	Free	Su S
0100	Flash	Su S
0530	Free	M T W Th F
0600	2	M T W Th F
0600	Free	Su S
0700	19	Su S
0715	4	M T W Th F
0900	Free	M T W Th F
0900	Free	Su S
1330	9	M T W Th F
1530	12	M T W Th F
1600	21	Su S
1900	Free	Su S
1930	Free	M T W Th F

Current Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	--------	M T W ThF
0500	TOD OUTPUTS	-------1	M T W ThF
0600	TOD OUTPUTS	--------	M T W ThF
0600	VEH MAX RECALL	8---4---	M T W ThF
0715	TOD OUTPUTS	------2-	M T W ThF
0900	VEH MAX RECALL	--------	M T W ThF
0900	TOD OUTPUTS	-------1	M T W ThF
1530	TOD OUTPUTS	------2-	M T W ThF
1530	VEH MAX RECALL	8---4---	M T W ThF
1930	VEH MAX RECALL	--------	M T W ThF
1930	TOD OUTPUTS	-------1	M T W ThF

Local Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	--------	M T W ThF
0000	TOD OUTPUTS	-------1	Su S
0100	TOD OUTPUTS	--------	Su S
0500	TOD OUTPUTS	-------1	M T W ThF
0600	TOD OUTPUTS	--------	M T W ThF
0600	VEH MAX RECALL	8---4---	M T W ThF
0600	TOD OUTPUTS	--------	Su S
0715	TOD OUTPUTS	------2-	M T W ThF
0730	TOD OUTPUTS	-------1	Su S
0900	VEH MAX RECALL	--------	M T W ThF
0900	TOD OUTPUTS	-------1	M T W ThF
1530	TOD OUTPUTS	------2-	M T W ThF
1530	VEH MAX RECALL	8---4---	M T W ThF
1930	VEH MAX RECALL	--------	M T W ThF
1930	TOD OUTPUTS	-------1	M T W ThF

*** Settings**

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

No Calendar Defined/Enabled

TOD Schedule Report

for 5811: Galloway Rd&SW 216 St

Print Date: 10/15/2013

Print Time: 8:06 AM

Asset	Intersection	TOD Schedule	Op Mode	Plan #	Cycle	Offset	TOD Setting	Active PhaseBank	Active Maximum
5811	Galloway Rd&SW 216 St	DOW-3		N/A	0	0	N/A	0	Max 0

Splits

PH 1	PH 2	PH 3	PH 4	PH 5	PH 6	PH 7	PH 8
NBL	SBT	EBT	WBT	SBL	NBT	-	-
0	0	0	0	0	0	0	0

Active Phase Bank: Phase Bank 1

Phase		Walk			Don't Walk			Min Initial			Veh Ext			Max Limit			Max 2			Yellow	Red
		Phase Bank 1																			
1	NBL	0	0	0	0	0	0	5	5	5	2	2	2	7	13	7	0	10	0	3	0
2	SBT	0	0	7	0	0	17	15	15	7	1	1	1	30	40	30	0	55	0	4	1
3	EBT	0	0	0	0	0	0	7	7	7	3.5	3.5	3.5	35	70	25	0	60	0	4	1
4	WBT	0	0	7	0	0	9	7	7	7	2.5	3.5	2.5	25	25	18	0	30	0	4	1
5	SBL	0	0	0	0	0	0	5	5	5	2	2	2	7	13	7	0	10	0	3	0
6	NBT	0	0	7	0	0	17	15	15	7	1	1	1	30	40	30	0	55	0	4	1
7	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Current TOD Schedule	Plan	Cycle	1 NBL	2 SBT	3 EBT	4 WBT	5 SBL	6 NBT	7 -	8 -	Ring Offset	Offset

Last In Service Date: unknown

Permitted Phases

	12345678
Default	123456--
External Permit 0	--------
External Permit 1	123456--
External Permit 2	123456--

Local TOD Schedule

Time	Plan	DOW
0000	Free	Su M T W Th F S

Current Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	--------	SuM T W ThF S
0730	TOD OUTPUTS	-------1	M T W ThF
0900	TOD OUTPUTS	--------	M T W ThF
1330	TOD OUTPUTS	------2-	M T W ThF
1530	TOD OUTPUTS	--------	M T W ThF

Local Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	--------	SuM T W ThF S
0730	TOD OUTPUTS	-------1	M T W ThF
0900	TOD OUTPUTS	--------	M T W ThF
1330	TOD OUTPUTS	------2-	M T W ThF
1530	TOD OUTPUTS	--------	M T W ThF

*** Settings**

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

No Calendar Defined/Enabled

APPENDIX E
TRAFFIC DATA

Traffic Survey Specialists, Inc.
85 SE 4th Avenue, Unit 109
Delray Beach, Florida 33483
Phone (561) 272-3255

SW 216TH STREET & OLD CUTLER ROAD
CUTLER BAY, FLORIDA
COUNTED BY: ROLANDO MARTINEZ
SIGNALIZED

Site Code : 00150226
Start Date: 11/05/15
File I.D. : 216SOLDC
Page : 1

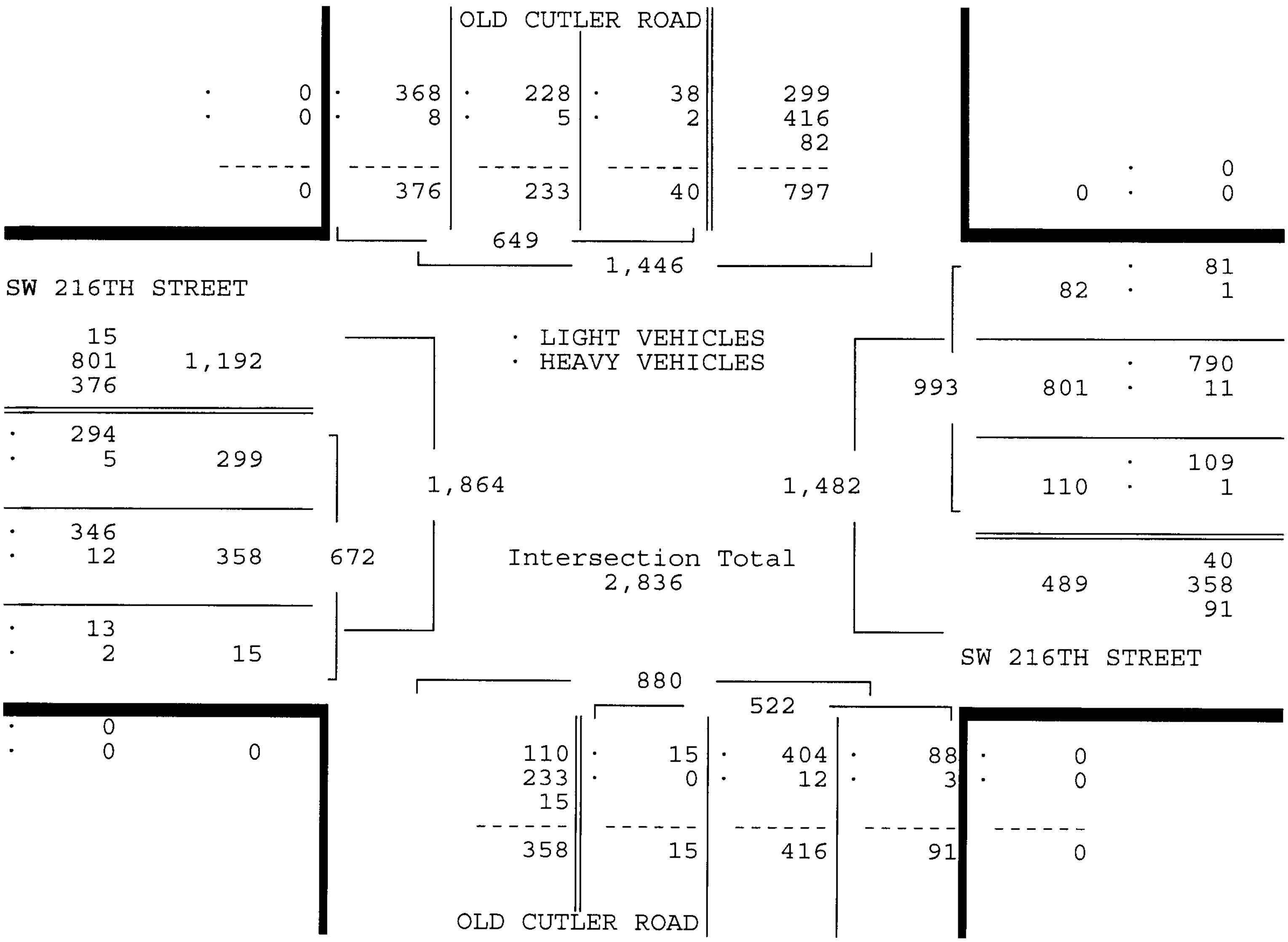
LIGHT VEHICLES, HEAVY VEHICLES

	OLD CUTLER ROAD From North				SW 216TH STREET From East				OLD CUTLER ROAD From South				SW 216TH STREET From West				
	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	Total
Date 11/05/15																	
07:00	0	5	34	68	0	33	168	18	0	5	110	13	0	59	41	8	562
07:15	0	8	38	72	0	22	174	16	0	4	107	12	0	56	85	5	599
07:30	0	6	49	68	0	29	187	23	0	2	106	17	1	66	116	5	675
07:45	0	9	49	71	0	46	201	21	0	0	99	23	0	71	86	3	679
Hr Total	0	28	170	279	0	130	730	78	0	11	422	65	1	252	328	21	2515
08:00	0	9	58	121	0	18	202	15	0	8	108	26	0	75	79	5	724
08:15	0	16	77	116	0	17	211	23	0	5	103	25	0	86	77	2	758
08:30	0	17	62	88	0	12	147	13	0	2	73	14	0	82	79	2	591
08:45	0	12	47	76	0	14	149	17	0	3	80	12	0	76	73	2	561
Hr Total	0	54	244	401	0	61	709	68	0	18	364	77	0	319	308	11	2634
---------- * BREAK * ----------																	
16:00	0	16	90	101	0	13	106	10	0	11	68	22	0	67	115	7	626
16:15	0	19	111	85	0	17	113	9	0	4	53	16	0	75	129	4	635
16:30	0	15	107	86	0	21	107	15	1	4	53	23	1	78	147	3	661
16:45	0	17	91	85	0	27	100	11	0	3	58	19	0	85	149	6	651
Hr Total	0	67	399	357	0	78	426	45	1	22	232	80	1	305	540	20	2573
17:00	0	11	98	81	0	18	110	10	0	1	70	27	0	78	186	10	700
17:15	0	25	101	72	0	33	110	23	0	5	48	19	0	74	175	2	687
17:30	0	26	112	89	0	19	94	14	0	5	66	24	0	76	188	6	719
17:45	0	19	112	103	0	28	111	17	0	6	66	20	1	102	190	6	781
Hr Total	0	81	423	345	0	98	425	64	0	17	250	90	1	330	739	24	2887
TOTAL	0	230	1236	1382	0	367	2290	255	1	68	1268	312	3	1206	1915	76	10609

SW 216TH STREET & OLD CUTLER ROAD	Traffic Survey Specialists, Inc.	Site Code : 00150226
CUTLER BAY, FLORIDA	85 SE 4th Avenue, Unit 109	Start Date: 11/05/15
COUNTED BY: ROLANDO MARTINEZ	Delray Beach, Florida 33483	File I.D. : 216SOLDC
SIGNALIZED	Phone (561) 272-3255	Page : 2

LIGHT VEHICLES, HEAVY VEHICLES

	OLD CUTLER ROAD From North				SW 216TH STREET From East				OLD CUTLER ROAD From South				SW 216TH STREET From West				
	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	Total
Date 11/05/15																	
Peak Hour Analysis By Entire Intersection for the Period: 07:00 to 09:00 on 11/05/15																	
Peak start	07:30				07:30				07:30				07:30				
Volume	0	40	233	376	0	110	801	82	0	15	416	91	1	298	358	15	
Percent	0%	6%	36%	58%	0%	11%	81%	8%	0%	3%	80%	17%	0%	44%	53%	2%	
Pk total	649				993				522				672				
Highest	08:15				07:45				08:00				07:30				
Volume	0	16	77	116	0	46	201	21	0	8	108	26	1	66	116	5	



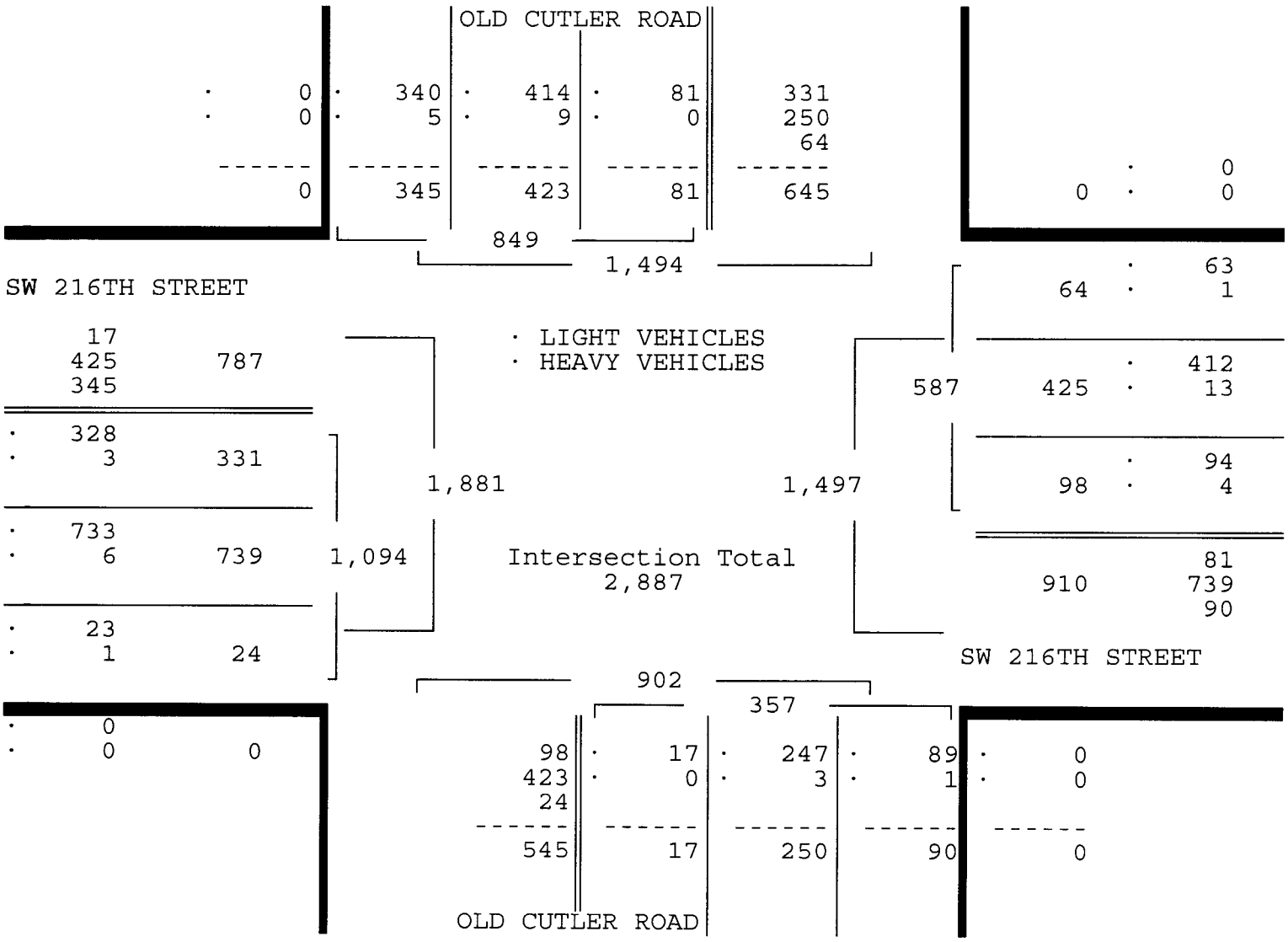
Traffic Survey Specialists, Inc.
85 SE 4th Avenue, Unit 109
Delray Beach, Florida 33483
Phone (561) 272-3255

SW 216TH STREET & OLD CUTLER ROAD
CUTLER BAY, FLORIDA
COUNTED BY: ROLANDO MARTINEZ
SIGNALIZED

Site Code : 00150226
Start Date: 11/05/15
File I.D. : 216SOLDC

LIGHT VEHICLES, HEAVY VEHICLES

	OLD CUTLER ROAD From North				SW 216TH STREET From East				OLD CUTLER ROAD From South				SW 216TH STREET From West				
	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	Total
Date 11/05/15																	
Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 11/05/15																	
Peak start 17:00					17:00				17:00				17:00				
Volume	0	81	423	345	0	98	425	64	0	17	250	90	1	330	739	24	
Percent	0%	10%	50%	41%	0%	17%	72%	11%	0%	5%	70%	25%	0%	30%	68%	2%	
Pk total	849				587				357				1094				
Highest	17:45				17:15				17:00				17:45				
Volume	0	19	112	103	0	33	110	23	0	1	70	27	1	102	190	6	



Traffic Survey Specialists, Inc.
85 SE 4th Avenue, Unit 109
Delray Beach, Florida 33483
Phone (561) 272-3255

SW 216TH STREET & SW 87TH STREET
CUTLER BAY, FLORIDA
COUNTED BY: ANDREW GONZALEZ
SIGNALIZED

Site Code : 00150226
Start Date: 11/05/15
File I.D. : 216S87AV
Page : 1

LIGHT VEHICLES, HEAVY VEHICLES

	SW 87TH AVENUE From North				SW 216TH STREET From East				SW 87TH AVENUE From South				SW 216TH STREET From West				
	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	Total
Date 11/05/15																	
07:00	0	4	21	10	0	1	0	1	0	4	65	1	0	79	1	5	192
07:15	0	6	18	20	0	0	1	5	0	6	60	1	0	78	7	2	204
07:30	0	5	22	31	0	1	0	5	0	4	58	3	0	83	0	5	217
07:45	0	7	22	47	0	0	4	2	0	4	52	1	0	86	1	6	232
Hr Total	0	22	83	108	0	2	5	13	0	18	235	6	0	326	9	18	845
08:00	1	8	27	68	0	0	4	8	0	1	62	2	0	75	10	14	280
08:15	0	3	24	65	0	1	7	5	0	2	46	4	0	65	10	9	241
08:30	0	1	27	42	0	1	3	4	0	2	22	0	0	43	0	8	153
08:45	0	1	13	27	0	0	2	3	0	7	31	0	0	48	2	5	139
Hr Total	1	13	91	202	0	2	16	20	0	12	161	6	0	231	22	36	813
---------- * BREAK * ----------																	
16:00	0	1	40	58	0	0	0	5	0	8	19	0	0	39	2	5	177
16:15	0	1	41	81	0	0	2	1	0	10	29	0	0	39	3	3	210
16:30	0	2	51	70	0	0	4	0	0	9	25	2	0	44	1	13	221
16:45	0	3	75	78	0	1	3	4	0	9	14	1	0	48	8	8	252
Hr Total	0	7	207	287	0	1	9	10	0	36	87	3	0	170	14	29	860
17:00	0	6	54	68	0	1	2	3	0	7	27	2	0	35	5	6	216
17:15	0	11	58	78	0	0	17	5	0	12	24	1	0	53	20	6	285
17:30	1	6	69	87	0	0	9	5	0	6	22	2	0	59	10	12	288
17:45	0	13	57	100	0	0	5	6	0	5	21	1	1	61	9	10	289
Hr Total	1	36	238	333	0	1	33	19	0	30	94	6	1	208	44	34	1078
TOTAL	2	78	619	930	0	6	63	62	0	96	577	21	1	935	89	117	3596

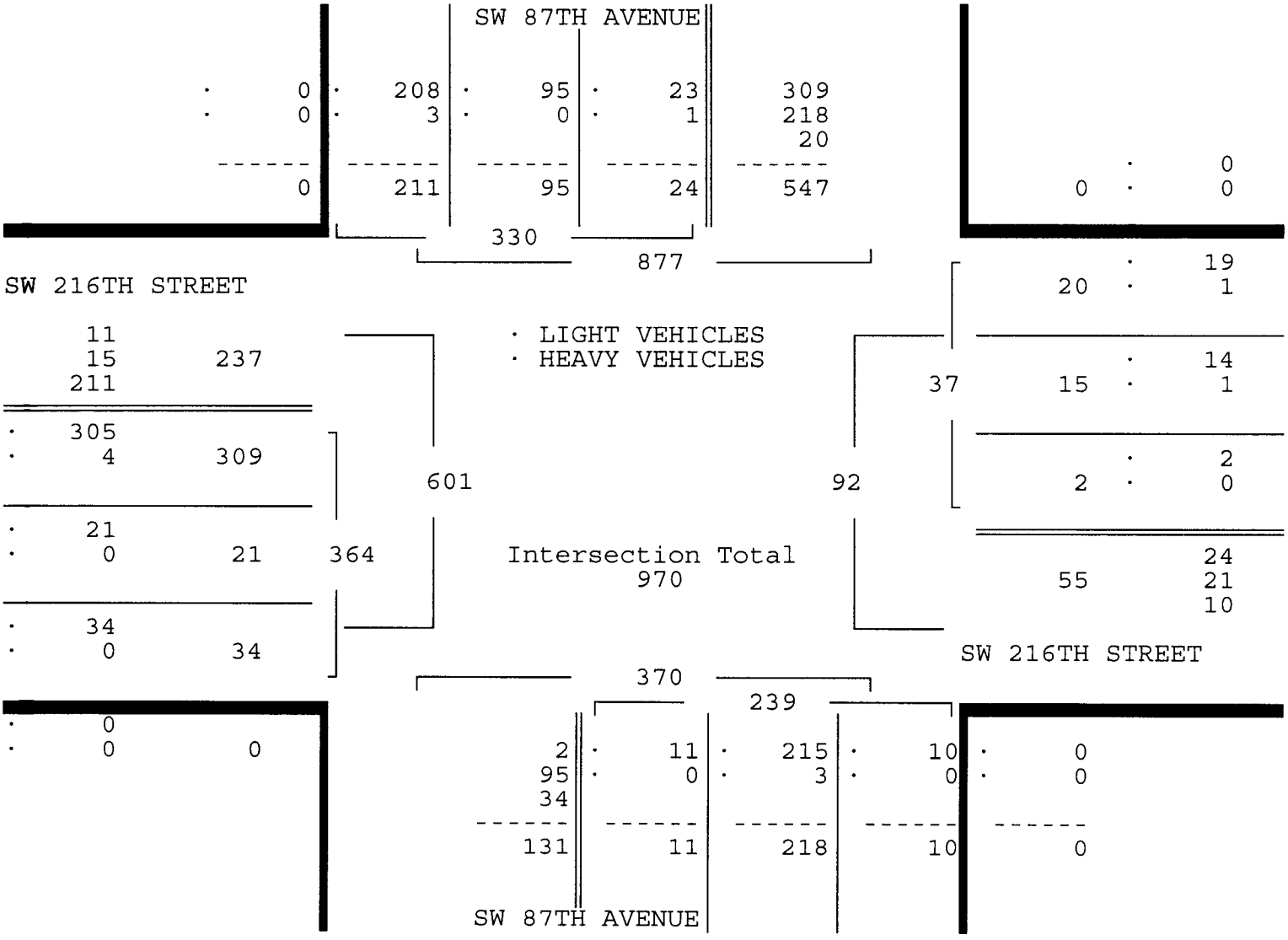
Traffic Survey Specialists, Inc.
85 SE 4th Avenue, Unit 109
Delray Beach, Florida 33483
Phone (561) 272-3255

SW 216TH STREET & SW 87TH STREET
CUTLER BAY, FLORIDA
COUNTED BY: ANDREW GONZALEZ
SIGNALIZED

Site Code : 00150226
Start Date: 11/05/15
File I.D. : 216S87AV

LIGHT VEHICLES, HEAVY VEHICLES

	SW 87TH AVENUE From North				SW 216TH STREET From East				SW 87TH AVENUE From South				SW 216TH STREET From West				
	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	Total
Date 11/05/15																	
Peak Hour Analysis By Entire Intersection for the Period: 07:00 to 09:00 on 11/05/15																	
Peak start 07:30					07:30				07:30				07:30				
Volume	1	23	95	211	0	2	15	20	0	11	218	10	0	309	21	34	
Percent	0%	7%	29%	64%	0%	5%	41%	54%	0%	5%	91%	4%	0%	85%	6%	9%	
Pk total	330				37				239				364				
Highest	08:00				08:15				07:30				08:00				
Volume	1	8	27	68	0	1	7	5	0	4	58	3	0	75	10	14	



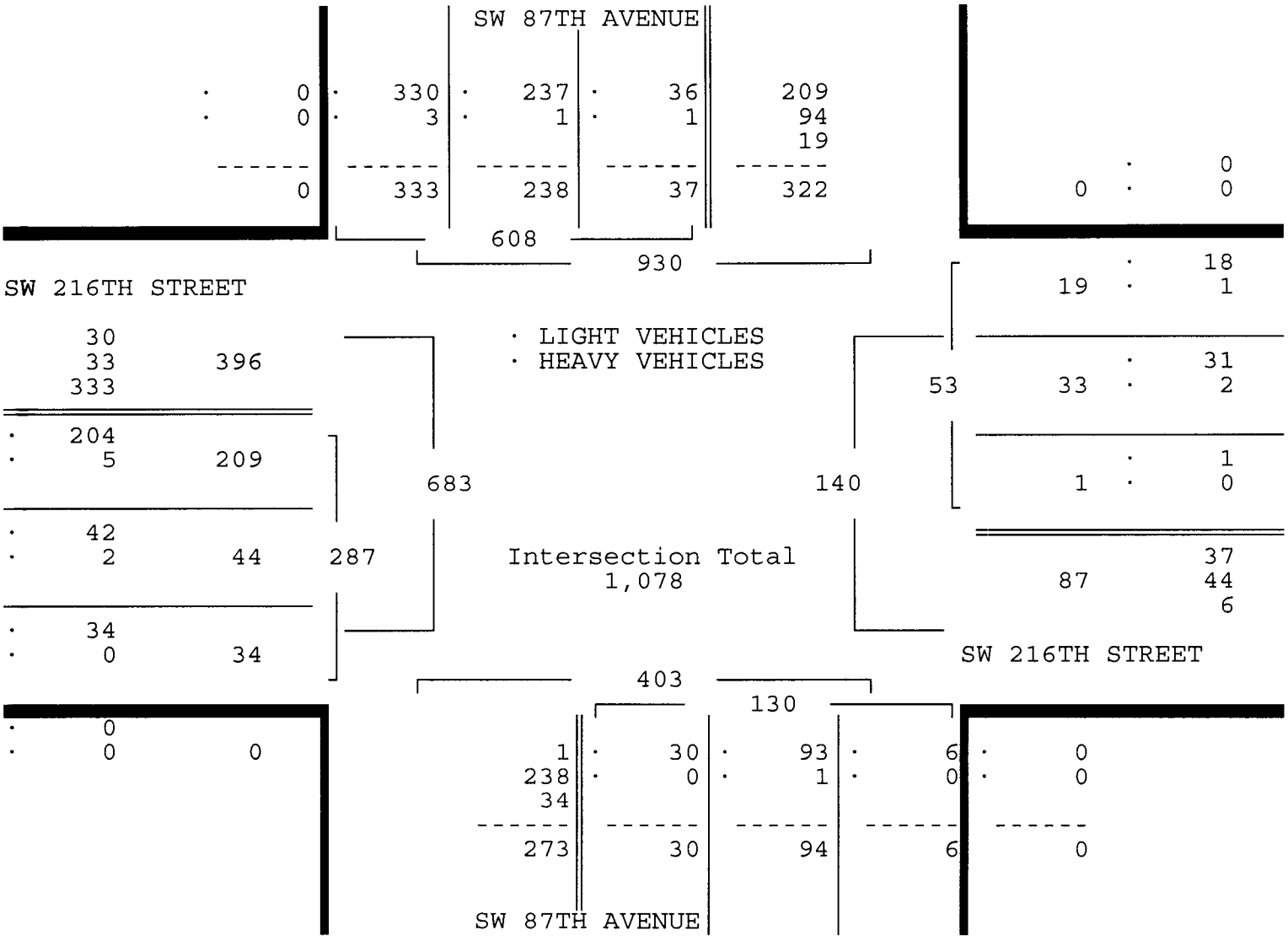
SW 216TH STREET & SW 87TH STREET
CUTLER BAY, FLORIDA
COUNTED BY: ANDREW GONZALEZ
SIGNALIZED

Traffic Survey Specialists, Inc.
85 SE 4th Avenue, Unit 109
Delray Beach, Florida 33483
Phone (561) 272-3255

Site Code : 00150226
Start Date: 11/05/15
File I.D. : 216S87AV

LIGHT VEHICLES, HEAVY VEHICLES

	SW 87TH AVENUE From North				SW 216TH STREET From East				SW 87TH AVENUE From South				SW 216TH STREET From West				
	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	Total
Date 11/05/15																	
Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 11/05/15																	
Peak start 17:00					17:00				17:00				17:00				
Volume	1	36	238	333	0	1	33	19	0	30	94	6	1	208	44	34	
Percent	0%	6%	39%	55%	0%	2%	62%	36%	0%	23%	72%	5%	0%	72%	15%	12%	
Pk total	608				53				130				287				
Highest	17:45				17:15				17:15				17:30				
Volume	0	13	57	100	0	0	17	5	0	12	24	1	0	59	10	12	



OLD CUTLER ROAD & SW 87TH AVENUE
CUTLER BAY, FLORIDA
COUNTED BY:M. CRUZ, C. PALOMINO. S. SALVO & A. PALOMINO

Traffic Survey Specialists, Inc.
85 SE 4th Avenue, Unit 109
Delray Beach, Florida 33483
Phone (561) 272-3255

Site Code : 00150226
Start Date: 11/05/15
File I.D. : OLDC87AV
Page : 1

LIGHT VEHICLES, HEAVY VEHICLES

	SW 87TH AVENUE From North				OLD CUTLER ROAD From East				SW 87TH AVENUE From South				OLD CUTLER ROAD From West				
	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	Total
Date 11/05/15																	
07:00	0	5	25	13	0	8	43	18	1	19	127	62	0	58	101	5	485
07:15	0	10	22	15	0	7	71	23	1	22	94	71	0	59	99	15	509
07:30	0	3	28	17	0	9	69	40	2	32	116	64	0	55	85	16	536
07:45	0	12	34	24	0	6	87	28	0	21	102	85	0	75	108	13	595
Hr Total	0	30	109	69	0	30	270	109	4	94	439	282	0	247	393	49	2125
08:00	0	15	30	46	0	14	106	28	1	20	95	66	1	74	80	15	591
08:15	0	11	38	47	0	11	88	21	0	14	80	90	1	71	119	29	620
08:30	1	2	20	37	0	18	78	16	0	4	44	84	0	61	105	27	497
08:45	0	8	26	28	0	12	79	20	0	4	47	101	0	32	115	28	500
Hr Total	1	36	114	158	0	55	351	85	1	42	266	341	2	238	419	99	2208
---------- * BREAK * ----------																	
16:00	0	20	44	38	0	40	109	7	0	7	27	35	3	14	69	39	452
16:15	0	14	62	23	0	43	117	8	0	8	35	93	1	15	90	42	551
16:30	0	11	63	30	0	37	102	10	0	7	27	78	0	11	86	38	500
16:45	0	13	55	26	0	47	94	4	0	5	25	60	0	15	81	46	471
Hr Total	0	58	224	117	0	167	422	29	0	27	114	266	4	55	326	165	1974
17:00	0	10	57	37	0	45	96	10	0	5	37	86	1	8	109	50	551
17:15	0	10	62	19	0	32	96	5	0	9	37	81	1	8	99	54	513
17:30	0	9	54	31	0	41	102	9	0	16	37	62	2	18	89	42	512
17:45	0	9	66	19	0	42	106	8	0	18	25	74	3	28	114	77	589
Hr Total	0	38	239	106	0	160	400	32	0	48	136	303	7	62	411	223	2165
TOTAL	1	162	686	450	0	412	1443	255	5	211	955	1192	13	602	1549	536	8472

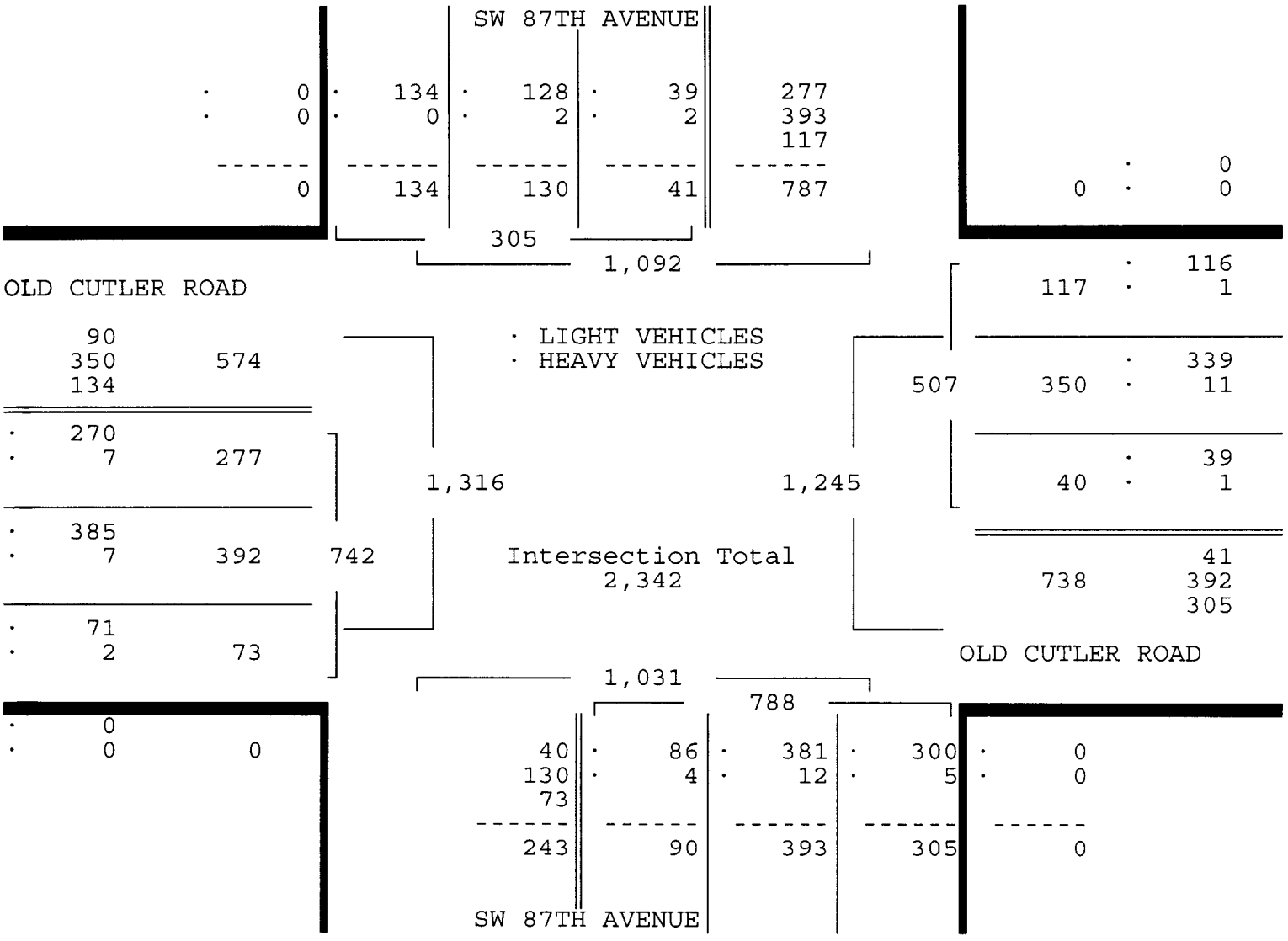
OLD CUTLER ROAD & SW 87TH AVENUE
CUTLER BAY, FLORIDA
COUNTED BY:M. CRUZ, C. PALOMINO. S. SALVO & A. PALOMINO

Traffic Survey Specialists, Inc.
85 SE 4th Avenue, Unit 109
Delray Beach, Florida 33483
Phone (561) 272-3255

Site Code : 00150226
Start Date: 11/05/15
File I.D. : OLDC87AV
Page : 2

LIGHT VEHICLES, HEAVY VEHICLES

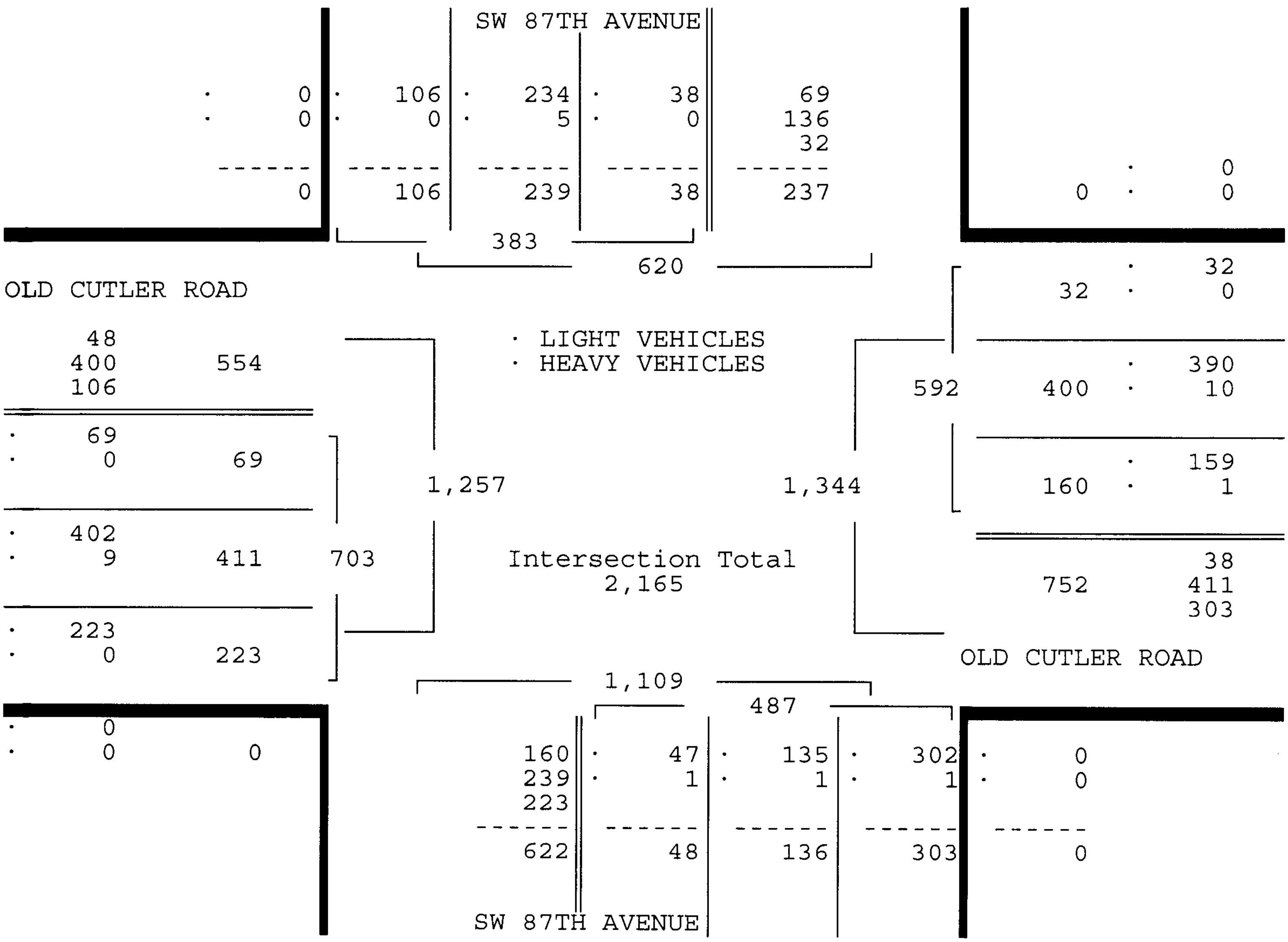
	SW 87TH AVENUE From North				OLD CUTLER ROAD From East				SW 87TH AVENUE From South				OLD CUTLER ROAD From West				
	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	Total
Date 11/05/15																	
Peak Hour Analysis By Entire Intersection for the Period: 07:00 to 09:00 on 11/05/15																	
Peak start 07:30					07:30				07:30				07:30				
Volume	0	41	130	134	0	40	350	117	3	87	393	305	2	275	392	73	
Percent	0%	13%	43%	44%	0%	8%	69%	23%	0%	11%	50%	39%	0%	37%	53%	10%	
Pk total	305				507				788				742				
Highest	08:15				08:00				07:30				08:15				
Volume	0	11	38	47	0	14	106	28	2	32	116	64	1	71	119	29	



Traffic Survey Specialists, Inc.
85 SE 4th Avenue, Unit 109
Delray Beach, Florida 33483
Phone (561) 272-3255

LIGHT VEHICLES, HEAVY VEHICLES

	SW 87TH AVENUE From North				OLD CUTLER ROAD From East				SW 87TH AVENUE From South				OLD CUTLER ROAD From West				
	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	Total
Date 11/05/15																	
Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 11/05/15																	
Peak start	17:00				17:00				17:00				17:00				
Volume	0	38	239	106	0	160	400	32	0	48	136	303	7	62	411	223	
Percent	0%	10%	62%	28%	0%	27%	68%	5%	0%	10%	28%	62%	1%	9%	58%	32%	
Pk total	383				592				487				703				
Highest	17:00				17:45				17:00				17:45				
Volume	0	10	57	37	0	42	106	8	0	5	37	86	3	28	114	77	



FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2014 HISTORICAL AADT REPORT

COUNTY: 87 - MIAMI-DADE

SITE: 1095 - SR 989/ALLAPATTAH DR, 200' N SW 216 ST

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2014	31000 C	N 15000	S 16000	9.00	59.30	5.20
2013	30500 C	N 15000	S 15500	9.00	58.90	4.40
2012	28000 C	N 14000	S 14000	9.00	59.70	6.10
2011	30500 C	N 15000	S 15500	9.00	58.20	5.20
2010	32500 C	N 16000	S 16500	7.87	58.27	5.20
2009	30500 C	N 14000	S 16500	7.98	59.96	5.40
2008	30000 C	N 15500	S 14500	8.07	66.31	5.90
2007	29000 C	N 13500	S 15500	7.90	63.12	7.20
2006	31500 C	N 16000	S 15500	7.39	58.66	13.10
2005	24500 C	N 12500	S 12000	7.70	65.70	8.90
2004	24500 C	N 12500	S 12000	8.20	67.10	8.90
2003	29000 C	N 14500	S 14500	8.10	72.30	4.50
2002	24000 C	N 12000	S 12000	9.80	52.30	1.00
2001	21500 C	N 10500	S 11000	8.20	53.50	7.40
2000	17300 C	N 9100	S 8200	8.20	53.10	1.40
1999	22000 C	N 10000	S 12000	9.10	52.70	4.10

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

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2014 HISTORICAL AADT REPORT

COUNTY: 87 - MIAMI-DADE

SITE: 0346 - SR 5/US-1, 100' N ALLAPATTAH RD/SW 112 AV

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2014	48000 C	N 27000	S 21000	9.00	59.30	7.80
2013	46000 C	N 25000	S 21000	9.00	58.90	5.30
2012	46000 C	N 23000	S 23000	9.00	59.70	5.70
2011	48000 C	N 24500	S 23500	9.00	58.20	5.80
2010	48500 C	N 25000	S 23500	7.87	58.27	5.80
2009	46500 C	N 25000	S 21500	7.98	59.96	4.80
2008	49000 C	N 26500	S 22500	8.07	66.31	5.60
2007	58000 F	N 34500	S 23500	7.90	63.12	4.80
2006	49500 C	N 29500	S 20000	7.39	58.66	4.80
2005	48500 C	N 26000	S 22500	7.70	65.70	11.80
2004	52500 C	N 27000	S 25500	8.20	67.10	11.80
2003	49500 C	N 25000	S 24500	8.10	72.30	3.10
2002	46500 C	N 24000	S 22500	9.20	68.00	3.20
2001	48500 C	N 25000	S 23500	8.20	53.50	4.90
2000	44500 C	N 21500	S 23000	8.20	53.10	1.80
1999	45000 C	N 25500	S 19500	9.10	52.70	5.20

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

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2014 HISTORICAL AADT REPORT

COUNTY: 87 - MIAMI-DADE

SITE: 0008 - SR 5/US-1, 100' S SILVER PALM DR/SW 232 ST

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2014	36000 C	N 19500	S 16500	9.00	59.30	5.80
2013	34500 C	N 17500	S 17000	9.00	58.90	5.40
2012	29500 C	N 13000	S 16500	9.00	59.70	5.70
2011	29000 C	N 16500	S 12500	9.00	58.20	6.10
2010	40000 C	N 21000	S 19000	7.87	58.27	6.90
2009	41000 C	N 21000	S 20000	7.98	59.96	6.30
2008	40500 C	N 21000	S 19500	8.07	66.31	7.10
2007	39500 C	N 20000	S 19500	7.90	63.12	8.00
2006	42000 C	N 21500	S 20500	7.39	58.66	6.10
2005	35500 C	N 18500	S 17000	7.70	65.70	5.50
2004	41500 F	N 21000	S 20500	8.20	67.10	8.50
2003	38500 C	N 19500	S 19000	8.10	72.30	5.40
2002	38500 C	N 20000	S 18500	9.20	68.00	3.80
2001	42500 C	N 22000	S 20500	8.20	53.50	6.70
2000	41500 C	N 21500	S 20000	8.20	53.10	3.60
1999	43500 C	N 22000	S 21500	9.10	52.70	4.90

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

2014 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
CATEGORY: 8701 MIAMI-DADE SOUTH

MOCF: 0.99

WEEK	DATES	SF	PSCF
1	01/01/2014 - 01/04/2014	0.98	0.99
2	01/05/2014 - 01/11/2014	1.01	1.02
3	01/12/2014 - 01/18/2014	1.03	1.04
4	01/19/2014 - 01/25/2014	1.02	1.03
5	01/26/2014 - 02/01/2014	1.01	1.02
6	02/02/2014 - 02/08/2014	1.00	1.01
7	02/09/2014 - 02/15/2014	1.00	1.01
8	02/16/2014 - 02/22/2014	0.99	1.00
* 9	02/23/2014 - 03/01/2014	0.99	1.00
*10	03/02/2014 - 03/08/2014	0.99	1.00
*11	03/09/2014 - 03/15/2014	0.99	1.00
*12	03/16/2014 - 03/22/2014	0.99	1.00
*13	03/23/2014 - 03/29/2014	0.99	1.00
*14	03/30/2014 - 04/05/2014	0.99	1.00
*15	04/06/2014 - 04/12/2014	0.99	1.00
*16	04/13/2014 - 04/19/2014	0.99	1.00
*17	04/20/2014 - 04/26/2014	0.99	1.00
*18	04/27/2014 - 05/03/2014	0.99	1.00
*19	05/04/2014 - 05/10/2014	0.99	1.00
*20	05/11/2014 - 05/17/2014	0.99	1.00
*21	05/18/2014 - 05/24/2014	0.99	1.00
22	05/25/2014 - 05/31/2014	1.00	1.01
23	06/01/2014 - 06/07/2014	1.01	1.02
24	06/08/2014 - 06/14/2014	1.01	1.02
25	06/15/2014 - 06/21/2014	1.02	1.03
26	06/22/2014 - 06/28/2014	1.02	1.03
27	06/29/2014 - 07/05/2014	1.03	1.04
28	07/06/2014 - 07/12/2014	1.03	1.04
29	07/13/2014 - 07/19/2014	1.04	1.05
30	07/20/2014 - 07/26/2014	1.03	1.04
31	07/27/2014 - 08/02/2014	1.02	1.03
32	08/03/2014 - 08/09/2014	1.02	1.03
33	08/10/2014 - 08/16/2014	1.01	1.02
34	08/17/2014 - 08/23/2014	1.00	1.01
35	08/24/2014 - 08/30/2014	1.01	1.02
36	08/31/2014 - 09/06/2014	1.01	1.02
37	09/07/2014 - 09/13/2014	1.01	1.02
38	09/14/2014 - 09/20/2014	1.01	1.02
39	09/21/2014 - 09/27/2014	1.01	1.02
40	09/28/2014 - 10/04/2014	1.00	1.01
41	10/05/2014 - 10/11/2014	1.00	1.01
42	10/12/2014 - 10/18/2014	0.99	1.00
43	10/19/2014 - 10/25/2014	0.99	1.00
44	10/26/2014 - 11/01/2014	1.00	1.01
45	11/02/2014 - 11/08/2014	1.00	1.01
46	11/09/2014 - 11/15/2014	1.00	1.01
47	11/16/2014 - 11/22/2014	1.00	1.01
48	11/23/2014 - 11/29/2014	1.00	1.01
49	11/30/2014 - 12/06/2014	0.99	1.00
50	12/07/2014 - 12/13/2014	0.99	1.00
51	12/14/2014 - 12/20/2014	0.98	0.99
52	12/21/2014 - 12/27/2014	1.01	1.02
53	12/28/2014 - 12/31/2014	1.03	1.04

* PEAK SEASON

GROWTH RATE CALCULATION
VISTA DEL LAGO

Roadway	FDOT Site	2009	2014
US-1 n/o SW 112 Ave	0346	46,500	48,000
US-1 s/o SW 232 St.	0008	41,000	36,000
SW 112 Ave. n/o SW 216 St.	1095	30,500	31,000
Total		118,000	115,000
Annual Growth Rate		**-0.51%**	

APPENDIX F
INTERSECTION VOLUME DEVELOPMENT SPREADSHEETS

A.M. PEAK HOUR TRAFFIC VOLUME CALCULATIONS

VISTA DEL LAGO

Intersection	Scenario	Traffic Volumes											
		EBLT	EBT	EBRT	WBLT	WBT	WBRT	NBLT	NBT	NBRT	SBLT	SBT	SBRT
Old Cutler Road at SW 216th Street	Traffic Count (11/5/2015)	299	358	15	110	801	82	15	416	91	40	233	376
	Peak Season Conversion Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
	2015 Peak Season Traffic	**302**	**362**	**15**	**111**	**809**	**83**	**15**	**420**	**92**	**40**	**235**	**380**
	Compound Growth Rate	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
	2018 Background Traffic	**307**	**367**	**15**	**113**	**821**	**84**	**15**	**426**	**93**	**41**	**239**	**385**
	In/Out		In		Out	Out	Out			In	In		
	Project Assignment		55%		3%	55%	10%			3%	10%		
	Net New Project Trips	0	8	0	2	38	7	0	0	0	1	0	0
	2018 Total Traffic	**307**	**375**	**15**	**115**	**859**	**91**	**15**	**426**	**93**	**42**	**239**	**385**
SW 216th Street at SW 87th Avenue	Traffic Count (11/5/2015)	309	21	34	2	15	20	11	218	10	24	95	211
	Peak Season Conversion Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
	2015 Peak Season Traffic	**312**	**21**	**34**	**2**	**15**	**20**	**11**	**220**	**10**	**24**	**96**	**213**
	Compound Growth Rate	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
	2018 Background Traffic	**317**	**22**	**35**	**2**	**15**	**21**	**11**	**223**	**10**	**25**	**97**	**216**
	In/Out	Out		Out				In					In
	Project Assignment	27%		5%				5%					27%
	Net New Project Trips	19	0	3	0	0	0	1	0	0	0	0	4
	2018 Total Traffic	**336**	**22**	**38**	**2**	**15**	**21**	**12**	**223**	**10**	**25**	**97**	**220**
Old Cutler Road at SW 87th Avenue	Traffic Count (11/5/2015)	277	392	73	40	350	117	90	393	305	41	130	134
	Peak Season Conversion Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
	2015 Peak Season Traffic	**280**	**396**	**74**	**40**	**354**	**118**	**91**	**397**	**308**	**41**	**131**	**135**
	Compound Growth Rate	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
	2018 Background Traffic	**284**	**402**	**75**	**41**	**359**	**120**	**92**	**403**	**313**	**42**	**133**	**137**
	In/Out				In				Out	Out		In	
	Project Assignment				17%				10%	17%		10%	
	Net New Project Trips	0	0	0	2	0	0	0	7	12	0	1	0
	2018 Total Traffic	**284**	**402**	**75**	**43**	**359**	**120**	**92**	**410**	**325**	**42**	**134**	**137**

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

P.M. PEAK HOUR TRAFFIC VOLUME CALCULATIONS

VISTA DEL LAGO

Intersection	Scenario	Traffic Volumes											
		EBLT	EBT	EBRT	WBLT	WBT	WBRT	NBLT	NBT	NBRT	SBLT	SBT	SBRT
Old Cutler Road at SW 216th Street	Traffic Count (11/5/2015)	331	739	24	98	425	64	17	250	90	81	423	345
	Peak Season Conversion Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
	2015 Peak Season Traffic	**334**	**746**	**24**	**99**	**429**	**65**	**17**	**253**	**91**	**82**	**427**	**348**
	Compound Growth Rate	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
	2018 Background Traffic	**339**	**758**	**25**	**100**	**436**	**66**	**17**	**256**	**92**	**83**	**434**	**354**
	In/Out		In		Out	Out	Out			In	In		
	Project Assignment		55%		3%	55%	10%			3%	10%		
	Net New Project Trips	0	36	0	1	18	3	0	0	2	7	0	0
	2018 Total Traffic	**339**	**794**	**25**	**101**	**454**	**69**	**17**	**256**	**94**	**90**	**434**	**354**
SW 216th Street at SW 87th Avenue	Traffic Count (11/5/2015)	209	44	34	1	33	19	30	94	6	37	238	333
	Peak Season Conversion Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
	2015 Peak Season Traffic	**211**	**44**	**34**	**1**	**33**	**19**	**30**	**95**	**6**	**37**	**240**	**336**
	Compound Growth Rate	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
	2018 Background Traffic	**214**	**45**	**35**	**1**	**34**	**19**	**31**	**96**	**6**	**38**	**244**	**341**
	In/Out	Out		Out				In					In
	Project Assignment	27%		5%				5%					27%
	Net New Project Trips	9	0	2	0	0	0	3	0	0	0	0	18
	2018 Total Traffic	**223**	**45**	**37**	**1**	**34**	**19**	**34**	**96**	**6**	**38**	**244**	**359**
Old Cutler Road at SW 87th Avenue	Traffic Count (11/5/2015)	69	411	223	160	400	32	48	136	303	38	239	106
	Peak Season Conversion Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
	2015 Peak Season Traffic	**70**	**415**	**225**	**162**	**404**	**32**	**48**	**137**	**306**	**38**	**241**	**107**
	Compound Growth Rate	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
	2018 Background Traffic	**71**	**421**	**229**	**164**	**410**	**33**	**49**	**139**	**311**	**39**	**245**	**109**
	In/Out				In				Out	Out		In	
	Project Assignment				17%				10%	17%		10%	
	Net New Project Trips	0	0	0	11	0	0	0	3	5	0	7	0
	2018 Total Traffic	**71**	**421**	**229**	**175**	**410**	**33**	**49**	**142**	**316**	**39**	**252**	**109**

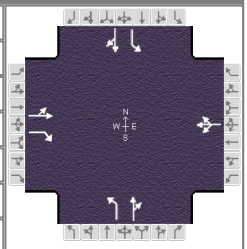
LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

APPENDIX G
INTERSECTION CAPACITY REPORTS

EXISTING CONDITIONS

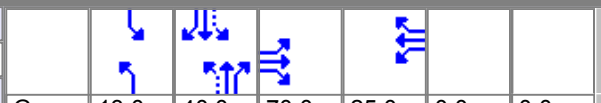
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	AM Peak Hour	PHF	0.87
Intersection	SW 216 Street	Analysis Year	2015	Analysis Period	1> 7:00
File Name	AM 87 Ave at 216 St Existing.xus				
Project Description	Vista Del Lago 2015 Existing				

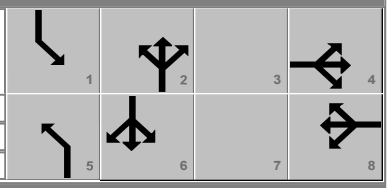


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	312	21	34	2	15	20	11	220	10	24	96	213

Signal Information			
Cycle, s	166.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	13.0	40.0	70.0	25.0	0.0	0.0
Yellow	3.0	4.0	4.0	4.0	0.0	0.0
Red	0.0	1.0	1.0	1.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		11.0		12.0	1.1	4.0	1.1	4.0
Phase Duration, s		75.0		30.0	16.0	45.0	16.0	45.0
Change Period, (Y+R_c), s		5.0		5.0	3.0	5.0	3.0	5.0
Max Allow Headway (*MAH*), s		3.1		3.2	3.2	3.2	3.2	3.2
Queue Clearance Time (g_s), s		28.3		5.6	2.8	23.0	3.8	36.4
Green Extension Time (g_e), s		0.8		0.0	0.0	1.2	0.0	0.6
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.00		0.00	0.00	0.00	0.00	0.82

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		383	39		43		13	264		28	355	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1779	1579		1693		1774	1848		1774	1657	
Queue Service Time (g_s), s		26.3	2.4		3.6		0.8	21.0		1.8	34.4	
Cycle Queue Clearance Time (g_c), s		26.3	2.4		3.6		0.8	21.0		1.8	34.4	
Green Ratio (*g*/*C*)		0.42	0.42		0.15		0.32	0.24		0.32	0.24	
Capacity (*c*), veh/h		750	666		255		205	445		296	399	
Volume-to-Capacity Ratio (*X*)		0.510	0.059		0.167		0.062	0.594		0.093	0.889	
Available Capacity (c_a), veh/h		750	666		255		205	445		296	399	
Back of Queue (*Q*), veh/ln (50th percentile)		11.9	1.0		1.7		0.4	10.6		0.8	17.2	
Queue Storage Ratio (*RQ*) (50th percentile)		0.00	0.00		0.00		0.12	0.00		0.08	0.00	
Uniform Delay (d_1), s/veh		35.4	28.5		61.4		42.8	55.8		40.7	60.9	
Incremental Delay (d_2), s/veh		2.5	0.2		1.4		0.6	5.7		0.6	24.4	
Initial Queue Delay (d_3), s/veh		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh		37.8	28.6		62.8		43.3	61.5		41.3	85.2	
Level of Service (LOS)		D	C		E		D	E		D	F	
Approach Delay, s/veh / LOS	37.0	D		62.8	E		60.7	E		82.1	F	
Intersection Delay, s/veh / LOS	59.1						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.3	B	2.1	B	2.3	B
Bicycle LOS Score / LOS	1.2	A	0.6	A	0.9	A	1.1	A

ROUNDABOUT REPORT

General Information		Site Information	
Analyst	John Kim	Intersection	Old Cutler Road/SW 87 Avenue
Agency or Co.	Langan Engineering	E/W Street Name	Old Cutler Road
Date Performed	11/10/2015	N/S Street Name	SW 87 Avenue
Time Period	AM Peak Hour	Analysis Year	2015 Existing
Peak Hour Factor	0.95	Project ID	Vista Del Lago

Project Description:

Volume Adjustment and Site Characteristics

	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes (N)	1	1	0		0	1	1		0	1	1		0	1	0	
Lane Assignment	L		TR		LT		R		LT		R				LTR	
Right-Turn Bypass	None				Yielding				None				None			
Conflicting Lanes	1				1				1				1			
Volume (V), veh/h	280	396	74	0	40	354	118	0	91	397	308	0	41	131	135	0
Heavy Veh. Adj. (f_{HV}), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929
Follow-Up Headway (sec)	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858

Flow Computations

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Circulating Flow (V_c), pc/h	228			825			770			521		
Exiting Flow (V_{ex}), pc/h	800			623			727			263		
Entry Flow (V_e), pc/h	301	505		423	0	127	524	331			330	
Entry Volume veh/h	295	495		415	0	125	514	325			324	

Capacity and v/c Ratios

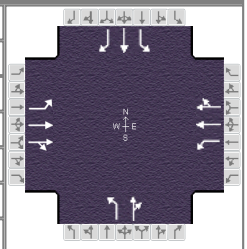
	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Capacity (c_{PCE}), pc/h	900	900		495	495	546	523	523			671	
Capacity (c), veh/h	882	882		486	486	536	513	513			658	
v/c Ratio (X)	0.33	0.56		0.85	0.00	0.23	1.00	0.63			0.49	

Delay and Level of Service

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	7.8	12.0		41.4	7.4	9.9	68.6	21.5			13.1	
Lane LOS	A	B		E	A	A	F	C			B	
Lane 95% Queue	1.5	3.6		8.8	0.0	0.9	13.9	4.4			2.7	
Approach Delay, s/veh	10.42			34.10			50.33			13.10		
Approach LOS, s/veh	B			D			F			B		
Intersection Delay, s/veh	29.33											
Intersection LOS	D											

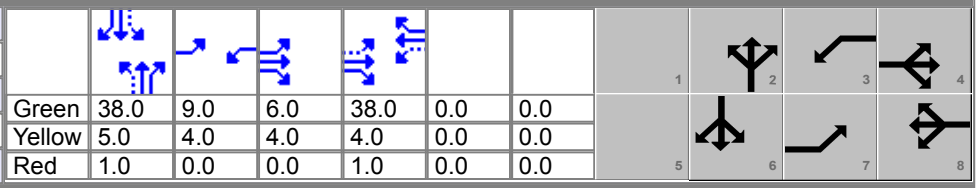
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	AM Peak Hour	PHF	0.94
Intersection	SW 216 Street	Analysis Year	2015	Analysis Period	1> 7:00
File Name	AM Old Cutler at 216 St Existing.xus				
Project Description	Vista Del Lago 2015 Existing				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	302	362	15	111	809	83	15	420	92	40	235	380

Signal Information			
Cycle, s	110.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	38.0	9.0	6.0	38.0	0.0	0.0
Yellow	5.0	4.0	4.0	4.0	0.0	0.0
Red	1.0	0.0	0.0	1.0	0.0	0.0

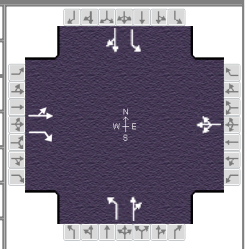
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8		2		6
Case Number	1.1	4.0	1.1	4.0		6.0		5.0
Phase Duration, s	23.0	53.0	13.0	43.0		44.0		44.0
Change Period, (*Y*+*Rc*), s	4.0	5.0	4.0	5.0		6.0		6.0
Max Allow Headway (*MAH*), s	3.2	3.1	3.2	3.1		3.2		3.2
Queue Clearance Time (g_s), s	13.3	9.6	6.5	27.2		33.1		38.5
Green Extension Time (g_e), s	0.4	2.8	0.0	2.4		1.6		0.0
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.14	0.00	1.00	0.15		0.67		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	321	201	200	118	482	467	16	545		43	250	404
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1774	1863	1836	1774	1863	1801	1125	1804		858	1863	1579
Queue Service Time (g_s), s	11.3	7.5	7.6	4.5	25.2	25.2	1.2	31.1		5.4	11.2	24.8
Cycle Queue Clearance Time (g_c), s	11.3	7.5	7.6	4.5	25.2	25.2	12.4	31.1		36.5	11.2	24.8
Green Ratio (*g*/*C*)	0.54	0.44	0.44	0.43	0.35	0.35	0.35	0.35		0.35	0.35	0.35
Capacity (*c*), veh/h	441	813	801	549	643	622	340	623		119	643	545
Volume-to-Capacity Ratio (*X*)	0.729	0.248	0.249	0.215	0.750	0.750	0.047	0.874		0.357	0.389	0.741
Available Capacity (c_a), veh/h	441	813	801	549	643	622	340	623		119	643	545
Back of Queue (*Q*), veh/ln (50th percentile)	5.6	3.4	3.4	2.0	12.5	12.2	0.3	15.9		1.4	5.2	10.5
Queue Storage Ratio (*RQ*) (50th percentile)	0.57	0.00	0.00	0.44	0.00	0.00	0.06	0.00		0.24	0.00	0.00
Uniform Delay (d_1), s/veh	20.3	19.6	19.6	19.3	31.8	31.8	31.9	33.8		50.9	27.2	31.7
Incremental Delay (d_2), s/veh	10.2	0.7	0.7	0.9	7.8	8.1	0.3	15.7		8.2	1.8	8.8
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	30.5	20.3	20.3	20.2	39.6	39.9	32.1	49.4		59.0	29.0	40.5
Level of Service (LOS)	C	C	C	C	D	D	C	D		E	C	D
Approach Delay, s/veh / LOS	24.9	C		37.6	D		48.9	D		37.5	D	
Intersection Delay, s/veh / LOS	36.6						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.4	B	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.1	A	1.4	A	1.4	A	1.6	A

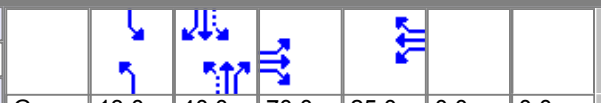
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	PM Peak Hour	PHF	0.93
Intersection	SW 216 Street	Analysis Year	2015	Analysis Period	1> 5:00
File Name	PM 87 Ave at 216 St Existing.xus				
Project Description	Vista Del Lago 2015 Existing				

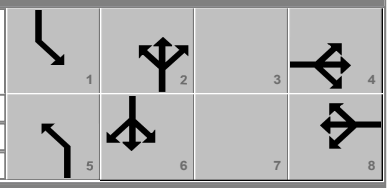


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	211	44	34	1	33	19	30	95	6	37	240	336

Signal Information			
Cycle, s	166.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	13.0	40.0	70.0	25.0	0.0	0.0
Yellow	3.0	4.0	4.0	4.0	0.0	0.0
Red	0.0	1.0	1.0	1.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		11.0		12.0	1.1	4.0	1.1	4.0
Phase Duration, s		75.0		30.0	16.0	45.0	16.0	45.0
Change Period, (*Y*+*Rc*), s		5.0		5.0	3.0	5.0	3.0	5.0
Max Allow Headway (*MAH*), s		3.1		3.1	3.2	3.3	3.2	3.3
Queue Clearance Time (g_s), s		19.4		6.8	4.1	9.9	4.6	42.0
Green Extension Time (g_e), s		0.6		0.1	0.0	1.7	0.0	0.0
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.00		0.00	0.00	0.00	0.00	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		274	37		57		32	109		40	619	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1789	1579		1748		1774	1843		1774	1686	
Queue Service Time (g_s), s		17.4	2.3		4.8		2.1	7.9		2.6	40.0	
Cycle Queue Clearance Time (g_c), s		17.4	2.3		4.8		2.1	7.9		2.6	40.0	
Green Ratio (*g*/*C*)		0.42	0.42		0.15		0.32	0.24		0.32	0.24	
Capacity (*c*), veh/h		754	666		263		182	444		414	406	
Volume-to-Capacity Ratio (*X*)		0.364	0.055		0.216		0.177	0.245		0.096	1.525	
Available Capacity (c_a), veh/h		754	666		263		182	444		414	406	
Back of Queue (*Q*), veh/ln (50th percentile)		7.8	0.9		2.2		1.0	3.9		1.2	45.2	
Queue Storage Ratio (*RQ*) (50th percentile)		0.00	0.00		0.00		0.31	0.00		0.12	0.00	
Uniform Delay (d_1), s/veh		32.8	28.4		61.9		44.0	50.8		39.6	63.0	
Incremental Delay (d_2), s/veh		1.4	0.2		1.9		2.1	1.3		0.5	248.4	
Initial Queue Delay (d_3), s/veh		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh		34.1	28.6		63.8		46.1	52.1		40.1	311.4	
Level of Service (LOS)		C	C		E		D	D		D	F	
Approach Delay, s/veh / LOS	33.5	C		63.8	E		50.7	D		295.0	F	
Intersection Delay, s/veh / LOS	184.7						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.3	B	2.1	B	2.3	B
Bicycle LOS Score / LOS	1.0	A	0.6	A	0.7	A	1.6	A

ROUNDABOUT REPORT

General Information		Site Information	
Analyst	John Kim	Intersection	Old Cutler Road/SW 87 Avenue
Agency or Co.	Langan Engineering	E/W Street Name	Old Cutler Road
Date Performed	11/10/2015	N/S Street Name	
Time Period	PM Peak Hour	Analysis Year	2015 Existing
Peak Hour Factor	0.94	Project ID	Vista Del Lago

Project Description:

Volume Adjustment and Site Characteristics

	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes (N)	1	1	0		0	1	1		0	1	1		0	1	0	
Lane Assignment	L		TR		LT		R		LT		R				LTR	
Right-Turn Bypass	None				Yielding				None				None			
Conflicting Lanes	1				1				1				1			
Volume (V), veh/h	70	415	225	0	162	404	32	0	48	137	306	0	38	241	107	0
Heavy Veh. Adj. (f_{HV}), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929
Follow-Up Headway (sec)	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858

Flow Computations

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Circulating Flow (V_c), pc/h	479			277			567			666		
Exiting Flow (V_{ex}), pc/h	824			607			225			681		
Entry Flow (V_e), pc/h	76	694		614	0	35	201	332			419	
Entry Volume veh/h	75	680		602	0	34	197	325			411	

Capacity and v/c Ratios

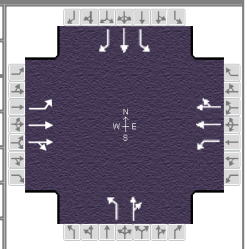
	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Capacity (c_{PCE}), pc/h	700	700		857	857	903	641	641			580	
Capacity (c), veh/h	687	687		840	840	885	628	628			569	
v/c Ratio (X)	0.11	0.99		0.72	0.00	0.04	0.31	0.52			0.72	

Delay and Level of Service

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	6.4	56.4		17.9	4.3	4.4	9.9	14.3			24.6	
Lane LOS	A	F		C	A	A	A	B			C	
Lane 95% Queue	0.4	15.6		6.3	0.0	0.1	1.3	3.0			6.0	
Approach Delay, s/veh	51.44			17.19			12.66			24.64		
Approach LOS, s/veh	F			C			B			C		
Intersection Delay, s/veh	28.62											
Intersection LOS	D											

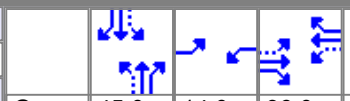
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	PM Peak Hour	PHF	0.92
Intersection	SW 216 Street	Analysis Year	2015	Analysis Period	1> 7:00
File Name	PM Old Cutler at 216 St Existing.xus				
Project Description	Vista Del Lago 2015 Existing				

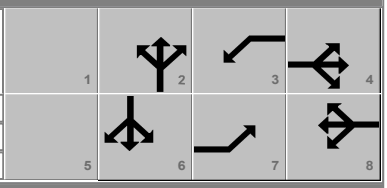


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	334	746	24	99	429	65	17	253	91	82	427	348

Signal Information			
Cycle, s	110.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	45.0	14.0	36.0	0.0	0.0	0.0
Yellow	5.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	0.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8		2		6
Case Number	1.1	4.0	1.1	4.0		6.0		5.0
Phase Duration, s	18.0	41.0	18.0	41.0		51.0		51.0
Change Period, (Y+R_c), s	4.0	5.0	4.0	5.0		6.0		6.0
Max Allow Headway (*MAH*), s	3.2	3.1	3.2	3.1		3.2		3.2
Queue Clearance Time (g_s), s	16.0	23.6	5.9	14.9		25.3		27.3
Green Extension Time (g_e), s	0.0	2.5	0.1	2.8		3.0		2.9
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	1.00	0.11	0.00	0.01		0.02		0.04

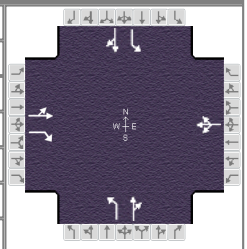
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	363	421	416	108	274	263	18	374		89	464	378
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1774	1863	1842	1774	1863	1777	925	1778		1004	1863	1579
Queue Service Time (g_s), s	14.0	21.6	21.6	3.9	12.7	12.9	1.8	17.3		8.0	21.6	20.5
Cycle Queue Clearance Time (g_c), s	14.0	21.6	21.6	3.9	12.7	12.9	23.3	17.3		25.3	21.6	20.5
Green Ratio (*g*/*C*)	0.45	0.33	0.33	0.45	0.33	0.33	0.41	0.41		0.41	0.41	0.41
Capacity (*c*), veh/h	457	610	603	365	610	582	262	727		318	762	646
Volume-to-Capacity Ratio (*X*)	0.794	0.690	0.690	0.295	0.449	0.453	0.070	0.514		0.280	0.609	0.586
Available Capacity (c_a), veh/h	457	610	603	365	610	582	262	727		318	762	646
Back of Queue (*Q*), veh/ln (50th percentile)	7.9	10.7	10.6	1.8	6.1	5.9	0.4	7.6		2.1	10.0	8.1
Queue Storage Ratio (*RQ*) (50th percentile)	0.81	0.00	0.00	0.39	0.00	0.00	0.07	0.00		0.36	0.00	0.00
Uniform Delay (d_1), s/veh	23.7	32.2	32.2	20.5	29.2	29.2	34.8	24.3		33.8	25.6	25.3
Incremental Delay (d_2), s/veh	13.3	6.3	6.4	2.0	2.4	2.5	0.5	2.6		2.2	3.6	3.9
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	37.0	38.4	38.5	22.5	31.6	31.8	35.3	26.9		36.0	29.2	29.1
Level of Service (LOS)	D	D	D	C	C	C	D	C		D	C	C
Approach Delay, s/veh / LOS	38.0	D		30.1	C		27.3	C		29.8	C	
Intersection Delay, s/veh / LOS	32.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.4	B	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.5	A	1.0	A	1.1	A	2.0	B

FUTURE NO BUILD CONDITIONS

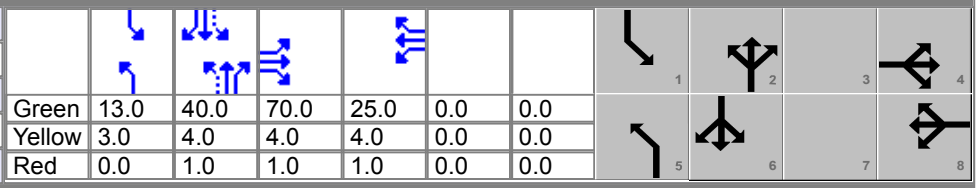
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	AM Peak Hour	PHF	0.87
Intersection	SW 216 Street	Analysis Year	2018	Analysis Period	1> 7:00
File Name	AM 87 Ave at 216 St No Build.xus				
Project Description	Vista Del Lago 2018 No Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	317	22	35	2	15	21	11	223	10	25	97	216

Signal Information			
Cycle, s	166.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	13.0	40.0	70.0	25.0	0.0	0.0
Yellow	3.0	4.0	4.0	4.0	0.0	0.0
Red	0.0	1.0	1.0	1.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		11.0		12.0	1.1	4.0	1.1	4.0
Phase Duration, s		75.0		30.0	16.0	45.0	16.0	45.0
Change Period, ($Y+R_c$), s		5.0		5.0	3.0	5.0	3.0	5.0
Max Allow Headway (*MAH*), s		3.1		3.2	3.2	3.2	3.2	3.2
Queue Clearance Time (g_s), s		28.9		5.7	2.8	23.3	3.9	36.9
Green Extension Time (g_e), s		0.8		0.0	0.0	1.3	0.0	0.5
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.00		0.00	0.00	0.00	0.00	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		390	40		44		13	268		29	360	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1780	1579		1690		1774	1848		1774	1657	
Queue Service Time (g_s), s		26.9	2.5		3.7		0.8	21.3		1.9	34.9	
Cycle Queue Clearance Time (g_c), s		26.9	2.5		3.7		0.8	21.3		1.9	34.9	
Green Ratio (*g*/*C*)		0.42	0.42		0.15		0.32	0.24		0.32	0.24	
Capacity (*c*), veh/h		750	666		255		201	445		293	399	
Volume-to-Capacity Ratio (*X*)		0.519	0.060		0.172		0.063	0.601		0.098	0.901	
Available Capacity (c_a), veh/h		750	666		255		201	445		293	399	
Back of Queue (*Q*), veh/ln (50th percentile)		12.2	1.0		1.7		0.4	10.8		0.9	17.6	
Queue Storage Ratio (*RQ*) (50th percentile)		0.00	0.00		0.00		0.12	0.00		0.09	0.00	
Uniform Delay (d_1), s/veh		35.5	28.5		61.5		42.9	55.9		40.8	61.1	
Incremental Delay (d_2), s/veh		2.6	0.2		1.5		0.6	5.9		0.7	25.9	
Initial Queue Delay (d_3), s/veh		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh		38.1	28.7		62.9		43.5	61.8		41.4	87.0	
Level of Service (LOS)		D	C		E		D	E		D	F	
Approach Delay, s/veh / LOS	37.2	D		62.9	E		61.0	E		83.7	F	
Intersection Delay, s/veh / LOS	59.8						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.3	B	2.1	B	2.3	B
Bicycle LOS Score / LOS	1.2	A	0.6	A	1.0	A	1.1	A

ROUNDABOUT REPORT

General Information		Site Information	
Analyst	John Kim	Intersection	Old Cutler Road/SW 87 Avenue
Agency or Co.	Langan Engineering	E/W Street Name	Old Cutler Road
Date Performed	11/10/2015	N/S Street Name	SW 87 Avenue
Time Period	AM Peak Hour	Analysis Year	2018 No Build
Peak Hour Factor	0.95	Project ID	Vista Del Lago

Project Description:

Volume Adjustment and Site Characteristics

	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes (N)	1	1	0		0	1	1		0	1	1		0	1	0	
Lane Assignment	L		TR		LT		R		LT		R				LTR	
Right-Turn Bypass	None				Yielding				None				None			
Conflicting Lanes	1				1				1				1			
Volume (V), veh/h	284	402	75	0	41	359	120	0	92	403	313	0	42	133	137	0
Heavy Veh. Adj. (f_{HV}), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929
Follow-Up Headway (sec)	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858

Flow Computations

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Circulating Flow (V_c), pc/h	232			837			782			528		
Exiting Flow (V_{ex}), pc/h	813			631			738			267		
Entry Flow (V_e), pc/h	305	512		429	0	129	531	336			335	
Entry Volume veh/h	299	502		421	0	126	521	329			328	

Capacity and v/c Ratios

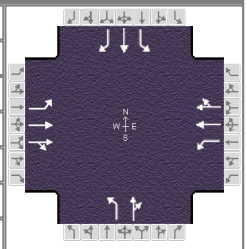
	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Capacity (c_{PCE}), pc/h	896	896		490	490	540	517	517			666	
Capacity (c), veh/h	879	879		480	480	530	507	507			653	
v/c Ratio (X)	0.34	0.57		0.88	0.00	0.24	1.03	0.65			0.50	

Delay and Level of Service

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	7.9	12.3		45.1	7.5	10.1	75.7	22.6			13.5	
Lane LOS	A	B		E	A	B	F	C			B	
Lane 95% Queue	1.5	3.7		9.4	0.0	0.9	14.8	4.6			2.8	
Approach Delay, s/veh	10.63			37.06			55.15			13.47		
Approach LOS, s/veh	B			E			F			B		
Intersection Delay, s/veh	31.70											
Intersection LOS	D											

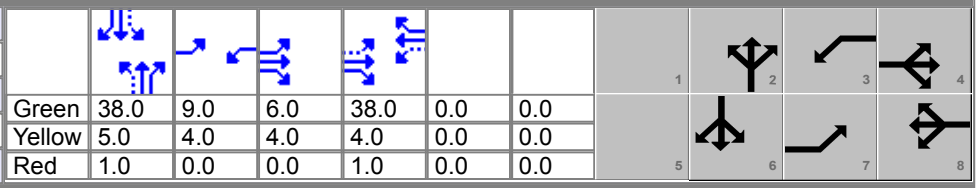
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	AM Peak Hour	PHF	0.94
Intersection	SW 216 Street	Analysis Year	2018	Analysis Period	1> 7:00
File Name	AM Old Cutler at 216 St No Build.xus				
Project Description	Vista Del Lago 2018 No Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	307	367	15	113	821	84	15	426	93	41	239	385

Signal Information			
Cycle, s	110.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	38.0	9.0	6.0	38.0	0.0	0.0
Yellow	5.0	4.0	4.0	4.0	0.0	0.0
Red	1.0	0.0	0.0	1.0	0.0	0.0

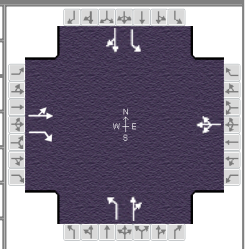
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8		2		6
Case Number	1.1	4.0	1.1	4.0		6.0		5.0
Phase Duration, s	23.0	53.0	13.0	43.0		44.0		44.0
Change Period, (*Y*+*Rc*), s	4.0	5.0	4.0	5.0		6.0		6.0
Max Allow Headway (*MAH*), s	3.2	3.1	3.2	3.1		3.2		3.2
Queue Clearance Time (g_s), s	13.5	9.7	6.6	27.7		33.7		39.3
Green Extension Time (g_e), s	0.4	2.9	0.0	2.4		1.5		0.0
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.17	0.00	1.00	0.18		0.78		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	327	204	202	120	489	473	16	552		44	254	410
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1774	1863	1837	1774	1863	1802	1121	1805		852	1863	1579
Queue Service Time (g_s), s	11.5	7.6	7.7	4.6	25.7	25.7	1.2	31.7		5.6	11.4	25.2
Cycle Queue Clearance Time (g_c), s	11.5	7.6	7.7	4.6	25.7	25.7	12.6	31.7		37.3	11.4	25.2
Green Ratio (*g*/*C*)	0.54	0.44	0.44	0.43	0.35	0.35	0.35	0.35		0.35	0.35	0.35
Capacity (*c*), veh/h	437	813	801	547	643	622	337	623		114	643	545
Volume-to-Capacity Ratio (*X*)	0.747	0.251	0.252	0.220	0.761	0.761	0.047	0.886		0.383	0.395	0.751
Available Capacity (c_a), veh/h	437	813	801	547	643	622	337	623		114	643	545
Back of Queue (*Q*), veh/ln (50th percentile)	5.8	3.5	3.4	2.0	12.8	12.5	0.3	16.4		1.5	5.3	10.7
Queue Storage Ratio (*RQ*) (50th percentile)	0.59	0.00	0.00	0.45	0.00	0.00	0.06	0.00		0.25	0.00	0.00
Uniform Delay (d_1), s/veh	20.5	19.6	19.6	19.4	32.0	32.0	32.1	34.0		51.6	27.3	31.8
Incremental Delay (d_2), s/veh	11.1	0.7	0.8	0.9	8.3	8.5	0.3	16.9		9.5	1.8	9.2
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	31.6	20.4	20.4	20.3	40.2	40.5	32.3	50.8		61.0	29.1	41.0
Level of Service (LOS)	C	C	C	C	D	D	C	D		E	C	D
Approach Delay, s/veh / LOS	25.4	C		38.1	D		50.3	D		38.0	D	
Intersection Delay, s/veh / LOS	37.3						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.4	B	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.1	A	1.4	A	1.4	A	1.7	A

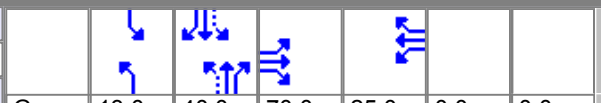
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	PM Peak Hour	PHF	0.93
Intersection	SW 216 Street	Analysis Year	2018	Analysis Period	1> 5:00
File Name	PM 87 Ave at 216 St No Build.xus				
Project Description	Vista Del Lago 2018 No Build				

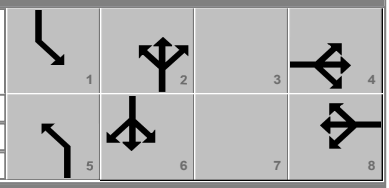


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	214	45	35	1	34	19	31	96	6	38	244	341

Signal Information			
Cycle, s	166.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	13.0	40.0	70.0	25.0	0.0	0.0
Yellow	3.0	4.0	4.0	4.0	0.0	0.0
Red	0.0	1.0	1.0	1.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		11.0		12.0	1.1	4.0	1.1	4.0
Phase Duration, s		75.0		30.0	16.0	45.0	16.0	45.0
Change Period, (*Y*+*Rc*), s		5.0		5.0	3.0	5.0	3.0	5.0
Max Allow Headway (*MAH*), s		3.1		3.1	3.2	3.3	3.2	3.3
Queue Clearance Time (*gs*), s		19.7		6.8	4.2	10.0	4.7	42.0
Green Extension Time (*ge*), s		0.6		0.1	0.0	1.8	0.0	0.0
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.00		0.00	0.00	0.00	0.00	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		278	38		58		33	110		41	629	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1789	1579		1750		1774	1843		1774	1686	
Queue Service Time (*gs*), s		17.7	2.3		4.8		2.2	8.0		2.7	40.0	
Cycle Queue Clearance Time (*gc*), s		17.7	2.3		4.8		2.2	8.0		2.7	40.0	
Green Ratio (*g*/*C*)		0.42	0.42		0.15		0.32	0.24		0.32	0.24	
Capacity (*c*), veh/h		754	666		264		182	444		414	406	
Volume-to-Capacity Ratio (*X*)		0.369	0.057		0.220		0.183	0.247		0.099	1.548	
Available Capacity (*ca*), veh/h		754	666		264		182	444		414	406	
Back of Queue (*Q*), veh/ln (50th percentile)		8.0	0.9		2.3		1.1	3.9		1.2	46.4	
Queue Storage Ratio (*RQ*) (50th percentile)		0.00	0.00		0.00		0.32	0.00		0.12	0.00	
Uniform Delay (*d1*), s/veh		32.9	28.4		61.9		44.0	50.8		39.7	63.0	
Incremental Delay (*d2*), s/veh		1.4	0.2		1.9		2.2	1.3		0.5	258.7	
Initial Queue Delay (*d3*), s/veh		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh		34.3	28.6		63.9		46.2	52.2		40.2	321.7	
Level of Service (LOS)		C	C		E		D	D		D	F	
Approach Delay, s/veh / LOS	33.6	C		63.9	E		50.8	D		304.6	F	
Intersection Delay, s/veh / LOS	190.1						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.3	B	2.1	B	2.3	B
Bicycle LOS Score / LOS	1.0	A	0.6	A	0.7	A	1.6	A

ROUNDABOUT REPORT

General Information		Site Information	
Analyst	John Kim	Intersection	Old Cutler Road/SW 87 Avenue
Agency or Co.	Langan Engineering	E/W Street Name	Old Cutler Road
Date Performed	11/10/2015	N/S Street Name	SW 87 Avenue
Time Period	PM Peak Hour	Analysis Year	2018 No Build
Peak Hour Factor	0.94	Project ID	Vista Del Lago

Project Description:

Volume Adjustment and Site Characteristics

	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes (N)	1	1	0		0	1	1		0	1	1		0	1	0	
Lane Assignment	L		TR		LT		R		LT		R				LTR	
Right-Turn Bypass	None				Yielding				None				None			
Conflicting Lanes	1				1				1				1			
Volume (V), veh/h	71	421	229	0	164	410	33	0	49	139	311	0	39	245	109	0
Heavy Veh. Adj. (f_{HV}), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929
Follow-Up Headway (sec)	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858

Flow Computations

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Circulating Flow (V_c), pc/h	486			281			576			676		
Exiting Flow (V_{ex}), pc/h	837			616			228			692		
Entry Flow (V_e), pc/h	77	705		623	0	36	204	337			426	
Entry Volume veh/h	75	691		611	0	35	200	330			418	

Capacity and v/c Ratios

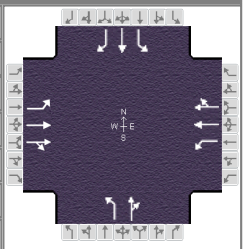
	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Capacity (c_{PCE}), pc/h	695	695		853	853	900	635	635			575	
Capacity (c), veh/h	681	681		836	836	882	623	623			563	
v/c Ratio (X)	0.11	1.01		0.73	0.00	0.04	0.32	0.53			0.74	

Delay and Level of Service

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	6.5	62.9		18.7	4.3	4.5	10.1	14.8			26.2	
Lane LOS	A	F		C	A	A	B	B			D	
Lane 95% Queue	0.4	16.7		6.6	0.0	0.1	1.4	3.1			6.4	
Approach Delay, s/veh	57.38			17.92			13.00			26.24		
Approach LOS, s/veh	F			C			B			D		
Intersection Delay, s/veh	31.09											
Intersection LOS	D											

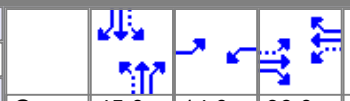
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	PM Peak Hour	PHF	0.92
Intersection	SW 216 Street	Analysis Year	2018	Analysis Period	1> 7:00
File Name	PM Old Cutler at 216 St No Build.xus				
Project Description	Vista Del Lago 2018 No Build				

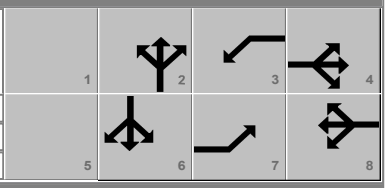


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	339	758	25	100	436	66	17	256	92	83	434	354

Signal Information			
Cycle, s	110.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	45.0	14.0	36.0	0.0	0.0	0.0						
Yellow	5.0	4.0	4.0	0.0	0.0	0.0						
Red	1.0	0.0	1.0	0.0	0.0	0.0						



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8		2		6
Case Number	1.1	4.0	1.1	4.0		6.0		5.0
Phase Duration, s	18.0	41.0	18.0	41.0		51.0		51.0
Change Period, (Y+R_c), s	4.0	5.0	4.0	5.0		6.0		6.0
Max Allow Headway (*MAH*), s	3.2	3.1	3.2	3.1		3.2		3.2
Queue Clearance Time (g_s), s	16.0	24.1	5.9	15.1		25.8		27.7
Green Extension Time (g_e), s	0.0	2.6	0.1	2.9		3.0		3.0
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	1.00	0.12	0.00	0.02		0.03		0.04

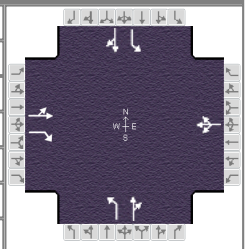
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	368	428	423	109	278	268	18	378		90	472	385
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1774	1863	1841	1774	1863	1777	918	1778		1000	1863	1579
Queue Service Time (g_s), s	14.0	22.1	22.1	3.9	13.0	13.1	1.8	17.6		8.2	22.0	21.0
Cycle Queue Clearance Time (g_c), s	14.0	22.1	22.1	3.9	13.0	13.1	23.8	17.6		25.7	22.0	21.0
Green Ratio (*g*/*C*)	0.45	0.33	0.33	0.45	0.33	0.33	0.41	0.41		0.41	0.41	0.41
Capacity (*c*), veh/h	454	610	603	361	610	582	257	727		315	762	646
Volume-to-Capacity Ratio (*X*)	0.812	0.702	0.702	0.301	0.456	0.460	0.072	0.520		0.286	0.619	0.596
Available Capacity (c_a), veh/h	454	610	603	361	610	582	257	727		315	762	646
Back of Queue (*Q*), veh/ln (50th percentile)	8.2	10.9	10.8	1.8	6.2	6.0	0.4	7.7		2.2	10.2	8.3
Queue Storage Ratio (*RQ*) (50th percentile)	0.83	0.00	0.00	0.40	0.00	0.00	0.07	0.00		0.37	0.00	0.00
Uniform Delay (d_1), s/veh	24.2	32.3	32.3	20.6	29.3	29.3	35.1	24.4		34.1	25.7	25.4
Incremental Delay (d_2), s/veh	14.6	6.6	6.7	2.1	2.5	2.6	0.5	2.6		2.3	3.8	4.0
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	38.7	38.9	39.0	22.7	31.7	31.9	35.7	27.0		36.3	29.5	29.4
Level of Service (LOS)	D	D	D	C	C	C	D	C		D	C	C
Approach Delay, s/veh / LOS	38.9	D		30.3	C		27.4	C		30.1	C	
Intersection Delay, s/veh / LOS	33.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.4	B	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.5	A	1.0	A	1.1	A	2.0	B

FUTURE BUILD CONDITIONS

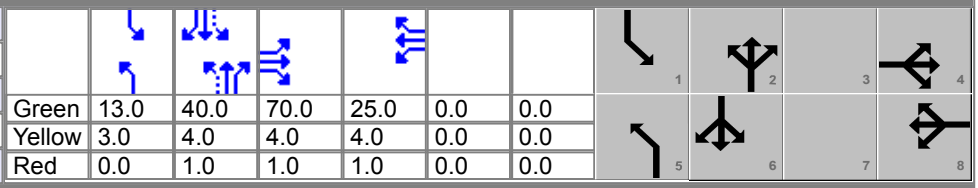
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	AM Peak Hour	PHF	0.87
Intersection	SW 216 Street	Analysis Year	2018	Analysis Period	1> 7:00
File Name	AM 87 Ave at 216 St Build.xus				
Project Description	Vista Del Lago 2018 Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	336	22	38	2	15	21	12	223	10	25	97	220

Signal Information			
Cycle, s	166.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	13.0	40.0	70.0	25.0	0.0	0.0
Yellow	3.0	4.0	4.0	4.0	0.0	0.0
Red	0.0	1.0	1.0	1.0	0.0	0.0

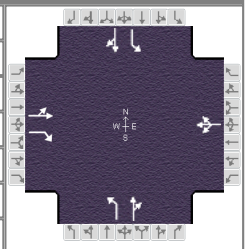
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		11.0		12.0	1.1	4.0	1.1	4.0
Phase Duration, s		75.0		30.0	16.0	45.0	16.0	45.0
Change Period, (Y+R_c), s		5.0		5.0	3.0	5.0	3.0	5.0
Max Allow Headway (*MAH*), s		3.1		3.2	3.2	3.2	3.2	3.2
Queue Clearance Time (g_s), s		30.9		5.7	2.9	23.3	3.9	37.5
Green Extension Time (g_e), s		0.9		0.0	0.0	1.3	0.0	0.5
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.00		0.00	0.00	0.00	0.00	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		411	44		44		14	268		29	364	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1779	1579		1690		1774	1848		1774	1656	
Queue Service Time (g_s), s		28.9	2.7		3.7		0.9	21.3		1.9	35.5	
Cycle Queue Clearance Time (g_c), s		28.9	2.7		3.7		0.9	21.3		1.9	35.5	
Green Ratio (*g*/*C*)		0.42	0.42		0.15		0.32	0.24		0.32	0.24	
Capacity (*c*), veh/h		750	666		255		197	445		293	399	
Volume-to-Capacity Ratio (*X*)		0.548	0.066		0.172		0.070	0.601		0.098	0.913	
Available Capacity (c_a), veh/h		750	666		255		197	445		293	399	
Back of Queue (*Q*), veh/ln (50th percentile)		13.1	1.1		1.7		0.4	10.8		0.9	18.1	
Queue Storage Ratio (*RQ*) (50th percentile)		0.00	0.00		0.00		0.13	0.00		0.09	0.00	
Uniform Delay (d_1), s/veh		36.1	28.5		61.5		43.1	55.9		40.8	61.3	
Incremental Delay (d_2), s/veh		2.9	0.2		1.5		0.7	5.9		0.7	27.7	
Initial Queue Delay (d_3), s/veh		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh		39.0	28.7		62.9		43.8	61.8		41.4	89.1	
Level of Service (LOS)		D	C		E		D	E		D	F	
Approach Delay, s/veh / LOS	38.0	D		62.9	E		60.9	E		85.6	F	
Intersection Delay, s/veh / LOS	60.4						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.3	B	2.1	B	2.3	B
Bicycle LOS Score / LOS	1.2	A	0.6	A	1.0	A	1.1	A

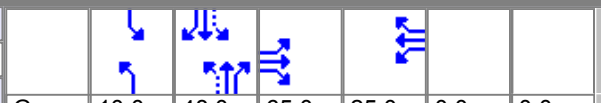
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	AM Peak Hour	PHF	0.87
Intersection	SW 216 Street	Analysis Year	2018	Analysis Period	1> 7:00
File Name	AM 87 Ave at 216 St Build Opt.xus				
Project Description	Vista Del Lago 2018 Build Optimized				

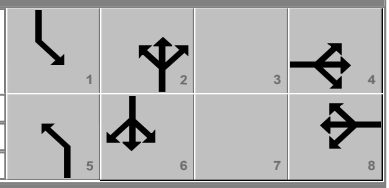


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	336	22	38	2	15	21	12	223	10	25	97	220

Signal Information			
Cycle, s	166.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	10.0	48.0	65.0	25.0	0.0	0.0
Yellow	3.0	4.0	4.0	4.0	0.0	0.0
Red	0.0	1.0	1.0	1.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		11.0		12.0	1.1	4.0	1.1	4.0
Phase Duration, s		70.0		30.0	13.0	53.0	13.0	53.0
Change Period, (Y+R_c), s		5.0		5.0	3.0	5.0	3.0	5.0
Max Allow Headway (*MAH*), s		3.1		3.2	3.2	3.2	3.2	3.2
Queue Clearance Time (g_s), s		32.4		5.7	2.8	22.0	3.8	35.3
Green Extension Time (g_e), s		0.9		0.0	0.0	1.3	0.0	1.2
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.00		0.00	0.00	0.00	0.00	0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		411	44		44		14	268		29	364	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1779	1579		1690		1774	1848		1774	1656	
Queue Service Time (g_s), s		30.4	2.9		3.7		0.8	20.0		1.8	33.3	
Cycle Queue Clearance Time (g_c), s		30.4	2.9		3.7		0.8	20.0		1.8	33.3	
Green Ratio (*g*/*C*)		0.39	0.39		0.15		0.35	0.29		0.35	0.29	
Capacity (*c*), veh/h		697	618		255		228	535		324	479	
Volume-to-Capacity Ratio (*X*)		0.591	0.071		0.172		0.061	0.501		0.089	0.761	
Available Capacity (c_a), veh/h		697	618		255		228	535		324	479	
Back of Queue (*Q*), veh/ln (50th percentile)		13.9	1.1		1.7		0.4	9.9		0.8	15.4	
Queue Storage Ratio (*RQ*) (50th percentile)		0.00	0.00		0.00		0.12	0.00		0.08	0.00	
Uniform Delay (d_1), s/veh		40.0	31.6		61.5		39.2	49.0		37.2	53.8	
Incremental Delay (d_2), s/veh		3.7	0.2		1.5		0.5	3.3		0.5	10.9	
Initial Queue Delay (d_3), s/veh		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh		43.6	31.8		62.9		39.7	52.4		37.7	64.6	
Level of Service (LOS)		D	C		E		D	D		D	E	
Approach Delay, s/veh / LOS	42.5	D		62.9	E		51.8	D		62.7	E	
Intersection Delay, s/veh / LOS	52.2						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.3	B	2.1	B	2.3	B
Bicycle LOS Score / LOS	1.2	A	0.6	A	1.0	A	1.1	A

ROUNDABOUT REPORT

General Information		Site Information	
Analyst	John Kim	Intersection	Old Cutler Road/SW 87 Avenue
Agency or Co.	Langan Engineering	E/W Street Name	Old Cutler Road
Date Performed	11/10/2015	N/S Street Name	
Time Period	AM Peak Hour	Analysis Year	2018 Build
Peak Hour Factor	0.95	Project ID	Vista Del Lago

Project Description:

Volume Adjustment and Site Characteristics

	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes (N)	1	1	0		0	1	0		0	1	1		0	1	0	
Lane Assignment	L		TR				LTR		LT		R				LTR	
Right-Turn Bypass	None				Yielding				None				None			
Conflicting Lanes	1				1				1				1			
Volume (V), veh/h	284	402	75	0	43	359	120	0	92	410	325	0	42	134	137	0
Heavy Veh. Adj. (f_{HV}), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929
Follow-Up Headway (sec)	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858

Flow Computations

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Circulating Flow (V_c), pc/h	235			844			782			530		
Exiting Flow (V_{ex}), pc/h	826			631			745			271		
Entry Flow (V_e), pc/h	305	512			432	129	539	349			336	
Entry Volume veh/h	299	502			424	126	528	342			329	

Capacity and v/c Ratios

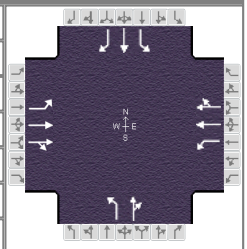
	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Capacity (c_{PCE}), pc/h	893	893			486	536	517	517			665	
Capacity (c), veh/h	876	876			476	526	507	507			652	
v/c Ratio (X)	0.34	0.57			0.89	0.24	1.04	0.67			0.51	

Delay and Level of Service

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	7.9	12.3			47.6	10.2	80.1	24.0			13.5	
Lane LOS	A	B			E	B	F	C			B	
Lane 95% Queue	1.5	3.7			9.7	0.9	15.5	5.0			2.9	
Approach Delay, s/veh	10.69			39.01			58.03			13.55		
Approach LOS, s/veh	B			E			F			B		
Intersection Delay, s/veh	33.32											
Intersection LOS	D											

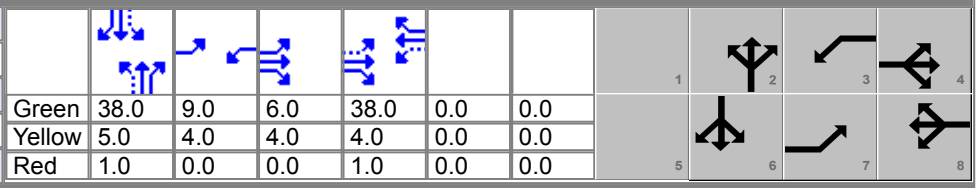
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	AM Peak Hour	PHF	0.94
Intersection	SW 216 Street	Analysis Year	2018	Analysis Period	1> 7:00
File Name	AM Old Cutler at 216 St Build.xus				
Project Description	Vista Del Lago 2018 Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	307	375	15	115	859	91	15	426	93	42	239	385

Signal Information			
Cycle, s	110.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	38.0	9.0	6.0	38.0	0.0	0.0
Yellow	5.0	4.0	4.0	4.0	0.0	0.0
Red	1.0	0.0	0.0	1.0	0.0	0.0

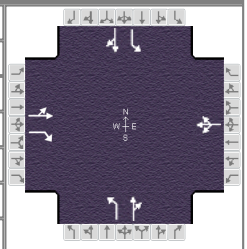
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8		2		6
Case Number	1.1	4.0	1.1	4.0		6.0		5.0
Phase Duration, s	23.0	53.0	13.0	43.0		44.0		44.0
Change Period, (*Y*+*Rc*), s	4.0	5.0	4.0	5.0		6.0		6.0
Max Allow Headway (*MAH*), s	3.2	3.1	3.2	3.1		3.2		3.2
Queue Clearance Time (g_s), s	13.5	9.9	6.7	29.4		33.7		39.5
Green Extension Time (g_e), s	0.4	3.1	0.0	2.4		1.5		0.0
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	0.17	0.00	1.00	0.29		0.78		1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	327	208	206	122	514	497	16	552		45	254	410
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1774	1863	1837	1774	1863	1800	1121	1805		852	1863	1579
Queue Service Time (g_s), s	11.5	7.8	7.9	4.7	27.4	27.4	1.2	31.7		5.7	11.4	25.2
Cycle Queue Clearance Time (g_c), s	11.5	7.8	7.9	4.7	27.4	27.4	12.6	31.7		37.5	11.4	25.2
Green Ratio (*g*/*C*)	0.54	0.44	0.44	0.43	0.35	0.35	0.35	0.35		0.35	0.35	0.35
Capacity (*c*), veh/h	425	813	802	545	643	622	337	623		114	643	545
Volume-to-Capacity Ratio (*X*)	0.768	0.256	0.258	0.225	0.799	0.799	0.047	0.886		0.392	0.395	0.751
Available Capacity (c_a), veh/h	425	813	802	545	643	622	337	623		114	643	545
Back of Queue (*Q*), veh/ln (50th percentile)	6.0	3.5	3.5	2.1	13.9	13.5	0.3	16.4		1.5	5.3	10.7
Queue Storage Ratio (*RQ*) (50th percentile)	0.61	0.00	0.00	0.45	0.00	0.00	0.06	0.00		0.26	0.00	0.00
Uniform Delay (d_1), s/veh	20.9	19.7	19.7	19.4	32.5	32.5	32.1	34.0		51.6	27.3	31.8
Incremental Delay (d_2), s/veh	12.5	0.8	0.8	1.0	10.0	10.3	0.3	16.9		9.8	1.8	9.2
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	33.4	20.4	20.5	20.3	42.5	42.9	32.3	50.8		61.5	29.1	41.0
Level of Service (LOS)	C	C	C	C	D	D	C	D		E	C	D
Approach Delay, s/veh / LOS	26.2	C		40.3	D		50.3	D		38.0	D	
Intersection Delay, s/veh / LOS	38.3						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.4	B	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.1	A	1.4	A	1.4	A	1.7	A

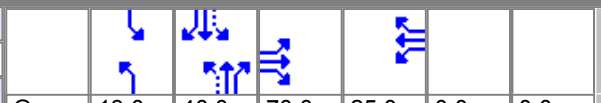
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	PM Peak Hour	PHF	0.93
Intersection	SW 216 Street	Analysis Year	2018	Analysis Period	1> 5:00
File Name	PM 87 Ave at 216 St Build.xus				
Project Description	Vista Del Lago 2018 Build				

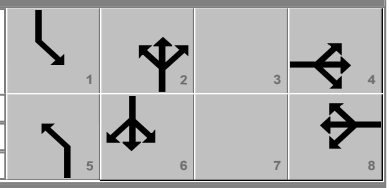


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	223	45	37	1	34	19	34	96	6	38	244	359

Signal Information			
Cycle, s	166.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	13.0	40.0	70.0	25.0	0.0	0.0
Yellow	3.0	4.0	4.0	4.0	0.0	0.0
Red	0.0	1.0	1.0	1.0	0.0	0.0



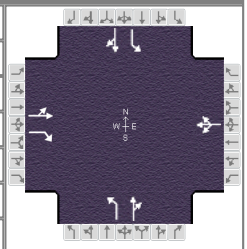
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		11.0		12.0	1.1	4.0	1.1	4.0
Phase Duration, s		75.0		30.0	16.0	45.0	16.0	45.0
Change Period, (*Y*+*Rc*), s		5.0		5.0	3.0	5.0	3.0	5.0
Max Allow Headway (*MAH*), s		3.1		3.1	3.2	3.3	3.2	3.3
Queue Clearance Time (g_s), s		20.4		6.8	4.4	10.0	4.7	42.0
Green Extension Time (g_e), s		0.6		0.1	0.0	1.8	0.0	0.0
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.00		0.00	0.00	0.00	0.00	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		288	40		58		37	110		41	648	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1788	1579		1750		1774	1843		1774	1682	
Queue Service Time (g_s), s		18.4	2.5		4.8		2.4	8.0		2.7	40.0	
Cycle Queue Clearance Time (g_c), s		18.4	2.5		4.8		2.4	8.0		2.7	40.0	
Green Ratio (*g*/*C*)		0.42	0.42		0.15		0.32	0.24		0.32	0.24	
Capacity (*c*), veh/h		754	666		264		182	444		414	405	
Volume-to-Capacity Ratio (*X*)		0.382	0.060		0.220		0.201	0.247		0.099	1.599	
Available Capacity (c_a), veh/h		754	666		264		182	444		414	405	
Back of Queue (*Q*), veh/ln (50th percentile)		8.3	1.0		2.3		1.2	3.9		1.2	48.8	
Queue Storage Ratio (*RQ*) (50th percentile)		0.00	0.00		0.00		0.35	0.00		0.12	0.00	
Uniform Delay (d_1), s/veh		33.1	28.5		61.9		44.1	50.8		39.7	63.0	
Incremental Delay (d_2), s/veh		1.5	0.2		1.9		2.5	1.3		0.5	281.1	
Initial Queue Delay (d_3), s/veh		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh		34.6	28.6		63.9		46.5	52.2		40.2	344.1	
Level of Service (LOS)		C	C		E		D	D		D	F	
Approach Delay, s/veh / LOS	33.8	C		63.9	E		50.8	D		326.0	F	
Intersection Delay, s/veh / LOS	202.2						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.3	B	2.1	B	2.3	B
Bicycle LOS Score / LOS	1.0	A	0.6	A	0.7	A	1.6	A

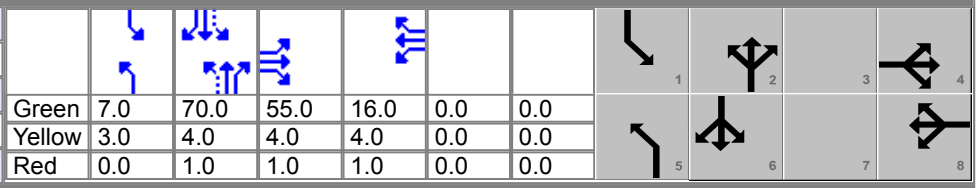
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	PM Peak Hour	PHF	0.93
Intersection	SW 216 Street	Analysis Year	2018	Analysis Period	1> 5:00
File Name	PM 87 Ave at 216 St Build Opt.xus				
Project Description	Vista Del Lago 2018 Build Optimized				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	223	45	37	1	34	19	34	96	6	38	244	359

Signal Information			
Cycle, s	166.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	7.0	70.0	55.0	16.0	0.0	0.0
Yellow	3.0	4.0	4.0	4.0	0.0	0.0
Red	0.0	1.0	1.0	1.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		11.0		12.0	1.1	4.0	1.1	4.0
Phase Duration, s		60.0		21.0	10.0	75.0	10.0	75.0
Change Period, ($Y+R_c$), s		5.0		5.0	3.0	5.0	3.0	5.0
Max Allow Headway (*MAH*), s		3.1		3.1	3.2	3.3	3.2	3.3
Queue Clearance Time (g_s), s		23.3		7.1	3.9	8.1	4.1	62.2
Green Extension Time (g_e), s		0.6		0.0	0.0	1.9	0.0	1.3
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.00		0.00	1.00	0.00	1.00	0.17

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h		288	40		58		37	110		41	648	
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1788	1579		1750		1774	1843		1774	1682	
Queue Service Time (g_s), s		21.3	2.9		5.1		1.9	6.1		2.1	60.2	
Cycle Queue Clearance Time (g_c), s		21.3	2.9		5.1		1.9	6.1		2.1	60.2	
Green Ratio (*g/C*)		0.33	0.33		0.10		0.46	0.42		0.46	0.42	
Capacity (*c*), veh/h		593	523		169		155	777		595	709	
Volume-to-Capacity Ratio (*X*)		0.486	0.076		0.344		0.236	0.141		0.069	0.914	
Available Capacity (c_a), veh/h		593	523		169		155	777		595	709	
Back of Queue (*Q*), veh/ln (50th percentile)		9.9	1.2		2.6		1.0	2.9		0.9	28.7	
Queue Storage Ratio (*RQ*) (50th percentile)		0.00	0.00		0.00		0.29	0.00		0.09	0.00	
Uniform Delay (d_1), s/veh		44.2	38.1		70.1		36.6	29.5		24.6	45.2	
Incremental Delay (d_2), s/veh		2.8	0.3		5.5		3.6	0.4		0.2	18.3	
Initial Queue Delay (d_3), s/veh		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh		47.1	38.4		75.6		40.1	29.9		24.8	63.5	
Level of Service (LOS)		D	D		E		D	C		C	E	
Approach Delay, s/veh / LOS	46.0	D		75.6	E		32.5	C		61.2	E	
Intersection Delay, s/veh / LOS	54.4						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.3	B	2.1	B	2.3	B
Bicycle LOS Score / LOS	1.0	A	0.6	A	0.7	A	1.6	A

ROUNDABOUT REPORT

General Information		Site Information	
Analyst	John Kim	Intersection	Old Cutler Road/SW 87 Avenue
Agency or Co.	Langan Engineering	E/W Street Name	Old Cutler Road
Date Performed	11/10/2015	N/S Street Name	SW 87 Avenue
Time Period	PM Peak Hour	Analysis Year	2018 Build
Peak Hour Factor	0.94	Project ID	Vista Del Lago

Project Description:

Volume Adjustment and Site Characteristics

	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes (N)	1	1	0		0	1	1		0	1	1		0	1	0	
Lane Assignment	L		TR		LT		R		LT		R				LTR	
Right-Turn Bypass	None				Yielding				None				None			
Conflicting Lanes	1				1				1				1			
Volume (V), veh/h	71	421	229	0	175	410	33	0	49	142	316	0	39	252	109	0
Heavy Veh. Adj. (f_{HV}), %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929
Follow-Up Headway (sec)	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858

Flow Computations

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Circulating Flow (V_c), pc/h	505			284			576			688		
Exiting Flow (V_{ex}), pc/h	842			616			231			712		
Entry Flow (V_e), pc/h	77	705		635	0	36	207	343			434	
Entry Volume veh/h	75	691		623	0	35	203	336			425	

Capacity and v/c Ratios

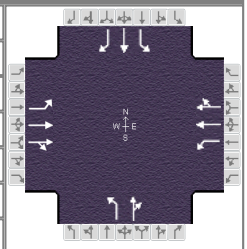
	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Capacity (c_{PCE}), pc/h	682	682		850	850	897	635	635			568	
Capacity (c), veh/h	668	668		834	834	879	623	623			557	
v/c Ratio (X)	0.11	1.03		0.75	0.00	0.04	0.33	0.54			0.76	

Delay and Level of Service

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	6.6	68.9		19.6	4.3	4.5	10.2	15.0			28.2	
Lane LOS	A	F		C	A	A	B	C			D	
Lane 95% Queue	0.4	17.6		7.0	0.0	0.1	1.4	3.2			6.9	
Approach Delay, s/veh	62.80			18.79			13.21			28.18		
Approach LOS, s/veh	F			C			B			D		
Intersection Delay, s/veh	33.32											
Intersection LOS	D											

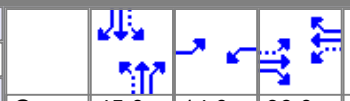
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Langan Engineering			Duration, h	0.25
Analyst	John Kim	Analysis Date	Nov 11, 2015	Area Type	Other
Jurisdiction	Cutler Bay	Time Period	PM Peak Hour	PHF	0.92
Intersection	SW 216 Street	Analysis Year	2018	Analysis Period	1> 7:00
File Name	PM Old Cutler at 216 St Build.xus				
Project Description	Vista Del Lago 2018 Build				

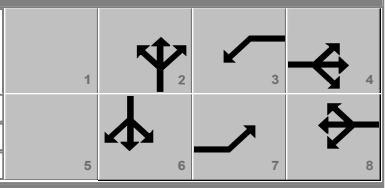


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	339	794	25	101	454	69	17	256	94	90	434	354

Signal Information			
Cycle, s	110.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	45.0	14.0	36.0	0.0	0.0	0.0
Yellow	5.0	4.0	4.0	0.0	0.0	0.0
Red	1.0	0.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8		2		6
Case Number	1.1	4.0	1.1	4.0		6.0		5.0
Phase Duration, s	18.0	41.0	18.0	41.0		51.0		51.0
Change Period, (*Y*+*Rc*), s	4.0	5.0	4.0	5.0		6.0		6.0
Max Allow Headway (*MAH*), s	3.2	3.1	3.2	3.1		3.2		3.2
Queue Clearance Time (g_s), s	16.0	25.4	6.0	15.8		25.8		28.7
Green Extension Time (g_e), s	0.0	2.6	0.1	3.0		3.1		3.0
Phase Call Probability	1.00	1.00	1.00	1.00		1.00		1.00
Max Out Probability	1.00	0.19	0.00	0.02		0.03		0.05

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	368	448	443	110	290	279	18	380		98	472	385
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1774	1863	1842	1774	1863	1777	918	1777		998	1863	1579
Queue Service Time (g_s), s	14.0	23.4	23.4	4.0	13.6	13.8	1.8	17.7		9.0	22.0	21.0
Cycle Queue Clearance Time (g_c), s	14.0	23.4	23.4	4.0	13.6	13.8	23.8	17.7		26.7	22.0	21.0
Green Ratio (*g*/*C*)	0.45	0.33	0.33	0.45	0.33	0.33	0.41	0.41		0.41	0.41	0.41
Capacity (*c*), veh/h	446	610	603	351	610	581	257	727		313	762	646
Volume-to-Capacity Ratio (*X*)	0.827	0.734	0.734	0.313	0.475	0.479	0.072	0.523		0.312	0.619	0.596
Available Capacity (c_a), veh/h	446	610	603	351	610	581	257	727		313	762	646
Back of Queue (*Q*), veh/ln (50th percentile)	8.4	11.7	11.6	1.8	6.5	6.3	0.4	7.8		2.4	10.2	8.3
Queue Storage Ratio (*RQ*) (50th percentile)	0.85	0.00	0.00	0.40	0.00	0.00	0.07	0.00		0.40	0.00	0.00
Uniform Delay (d_1), s/veh	24.5	32.8	32.8	21.0	29.5	29.5	35.1	24.4		34.5	25.7	25.4
Incremental Delay (d_2), s/veh	16.0	7.7	7.7	2.3	2.6	2.8	0.5	2.7		2.6	3.8	4.0
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	40.4	40.4	40.5	23.3	32.1	32.3	35.7	27.1		37.1	29.5	29.4
Level of Service (LOS)	D	D	D	C	C	C	D	C		D	C	C
Approach Delay, s/veh / LOS	40.5	D		30.8	C		27.5	C		30.2	C	
Intersection Delay, s/veh / LOS	33.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.4	B	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.5	A	1.0	A	1.1	A	2.1	B

DRIVEWAYS

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*John Kim*
Agency/Co.	*Langan Engineering*
Date Performed	*11/11/2015*
Analysis Time Period	*AM Peak Hour*

Site Information

Intersection	*SW 216 St/Project Driveway*
Jurisdiction	*Cutler Bay*
Analysis Year	*2018*

Project Description *Vista Del Lago Build Conditions*

East/West Street: *SW 216 Street* | North/South Street: *Project Driveway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*374*	*10*	*4*	*242*	
Peak-Hour Factor, PHF	*1.00*	*0.87*	*0.87*	*0.87*	*0.87*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*429*	*11*	*4*	*278*	*0*
Percent Heavy Vehicles	*0*	--	--	*2*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*1*	*2*	*0*
Configuration		*T*	*TR*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*47*		*22*			
Peak-Hour Factor, PHF	*0.87*	*1.00*	*0.87*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*54*	*0*	*25*	*0*	*0*	*0*
Percent Heavy Vehicles	*2*	*0*	*2*	*0*	*0*	*0*
Percent Grade (%)		*2*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*0*	*1*	*0*	*0*	*0*
Configuration	*L*		*R*			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*4*	*54*		*25*			
C (m) (veh/h)		*1116*	*493*		*808*			
v/c		*0.00*	*0.11*		*0.03*			
95% queue length		*0.01*	*0.37*		*0.10*			
Control Delay (s/veh)		*8.2*	*13.2*		*9.6*			
LOS		*A*	*B*		*A*			
Approach Delay (s/veh)	--	--	*12.1*					
Approach LOS	--	--	*B*					

HCS+™ Version 5.6

Generated: 11/11/2015 9:31 PM

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*John Kim*
Agency/Co.	*Langan Engineering*
Date Performed	*11/11/2015*
Analysis Time Period	*PM Peak Hour*

Site Information

Intersection	*SW 216 St/Project Driveway*
Jurisdiction	*Cutler Bay*
Analysis Year	*2018*

Project Description *Vista Del Lago Build Conditions*

East/West Street: *SW 216 Street* | North/South Street: *Project Driveway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*294*	*44*	*21*	*406*	
Peak-Hour Factor, PHF	*1.00*	*0.93*	*0.93*	*0.93*	*0.93*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*316*	*47*	*22*	*436*	*0*
Percent Heavy Vehicles	*0*	--	--	*2*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*1*	*2*	*0*
Configuration		*T*	*TR*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*22*		*10*			
Peak-Hour Factor, PHF	*0.93*	*1.00*	*0.93*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*23*	*0*	*10*	*0*	*0*	*0*
Percent Heavy Vehicles	*2*	*0*	*2*	*0*	*0*	*0*
Percent Grade (%)		*2*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*0*	*1*	*0*	*0*	*0*
Configuration	*L*		*R*			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*22*	*23*		*10*			
C (m) (veh/h)		*1192*	*497*		*851*			
v/c		*0.02*	*0.05*		*0.01*			
95% queue length		*0.06*	*0.15*		*0.04*			
Control Delay (s/veh)		*8.1*	*12.6*		*9.3*			
LOS		*A*	*B*		*A*			
Approach Delay (s/veh)	--	--	*11.6*					
Approach LOS	--	--	*B*					

HCS+™ Version 5.6

Generated: 11/11/2015 9:34 PM