

Gulf Beach Highway/Sorrento Road(SR292) Corridor Management Plan

173

SORRENTO RD

STEELERS LN

CAMMAN LN

CORAL CREEK DR

PAZ PD

BLUE ANGEL PKWY



BEGIN



Prepared by

July 2010



This report was financed in part by the U.S. Department of Transportation, Federal Highway Administration the Florida Department of Transportation.

SR 292 GULF BEACH HIGHWAY / SORRENTO ROAD CORRIDOR MANAGEMENT PLAN

ADOPTED: September 2010

PREPARED FOR:



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JULY 2010

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EXECUTIVE SUMMARY

In July 2009, the Florida-Alabama Transportation Planning Organization (TPO) commissioned PBS&J to prepare a Corridor Management Plan (CMP) for SR 292 from Blue Angel Parkway to Navy Boulevard. The purpose of this report is to identify problem areas along the corridor and to recommend potential improvements that would increase safety while preserving mobility and accessibility for all modes of transportation along the corridor. This report is also tasked with recommending land development code changes and/ or additions for the corridor. Gulf Beach Highway/Sorrento Road (SR 292) runs from Perdido Key Drive to Navy Boulevard (SR 295). This report focuses on the segment of SR 292 from Blue Angel Parkway to Navy Boulevard, which is approximately 5.2 miles long. This segment runs parallel to US 98 on the southern side. SR 292 is a prominent east-west southern corridor in Escambia County with close proximity to the Pensacola Naval Air Station.

Existing conditions along the Corridor were analyzed, including: current traffic volumes, turning movement counts, adjacent land use and available right-of-way. A capacity analysis was performed to analyze roadway and intersection capacity. Additionally, transportation planning documents, including those produced by the Florida Department of Transportation (FDOT) and the Florida-Alabama TPO were reviewed in order to identify planned corridor improvements. The segment of SR 292 from Fairfield Drive to Navy Boulevard is currently operating at a failing level of service at both the daily level (AADT) and during the peak hour in the westbound direction. All other roadway segments are currently operating at or above the adopted level of service (LOS) standard. Additionally, the intersection of SR 292 at Dog Track Road operates at LOS E during the PM peak hours. The intersection of SR 292 at Patton Drive also currently operates at LOS E during the PM Peak Hours.

Future corridor conditions were forecast to the year 2017, in order to perform a future roadway and intersection capacity analysis. In 2017, the segment of SR 292 from Fairfield Drive to Navy Boulevard is expected to operate at a failing level of service in both directions. SR 292 from Blue Angel Parkway to Old Gulf Beach Highway and SR 292 from Doug Ford Drive to Blue Angel

Parkway are expected to operate at a failing level of service in the westbound direction. SR 292 from Blue Angel Parkway to Fairfield Drive is not anticipated to have any deficiencies by 2017.

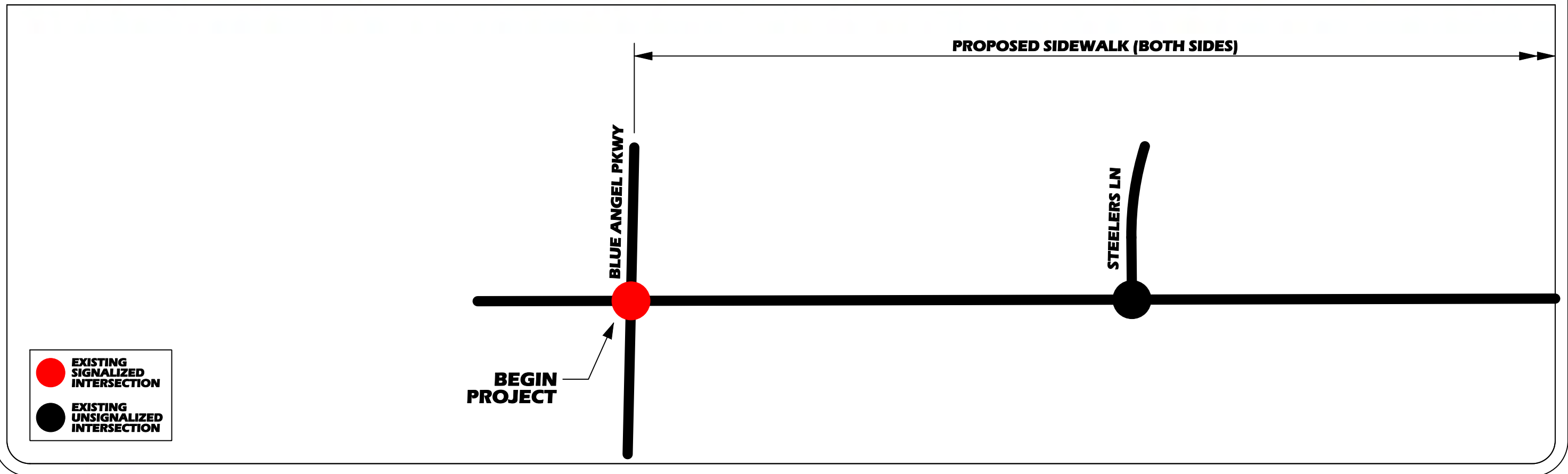
The intersections were analyzed using 2017 forecasted traffic, first with no improvements and then with signalization of the three currently unsignalized intersections: SR 292 at Old Gulf Beach Highway (CR 292A); SR 292 at Dog Track Road; and SR 292 at Patton Drive. Also included was a signal retiming at the intersection of Gulf Beach Highway and Navy Boulevard.

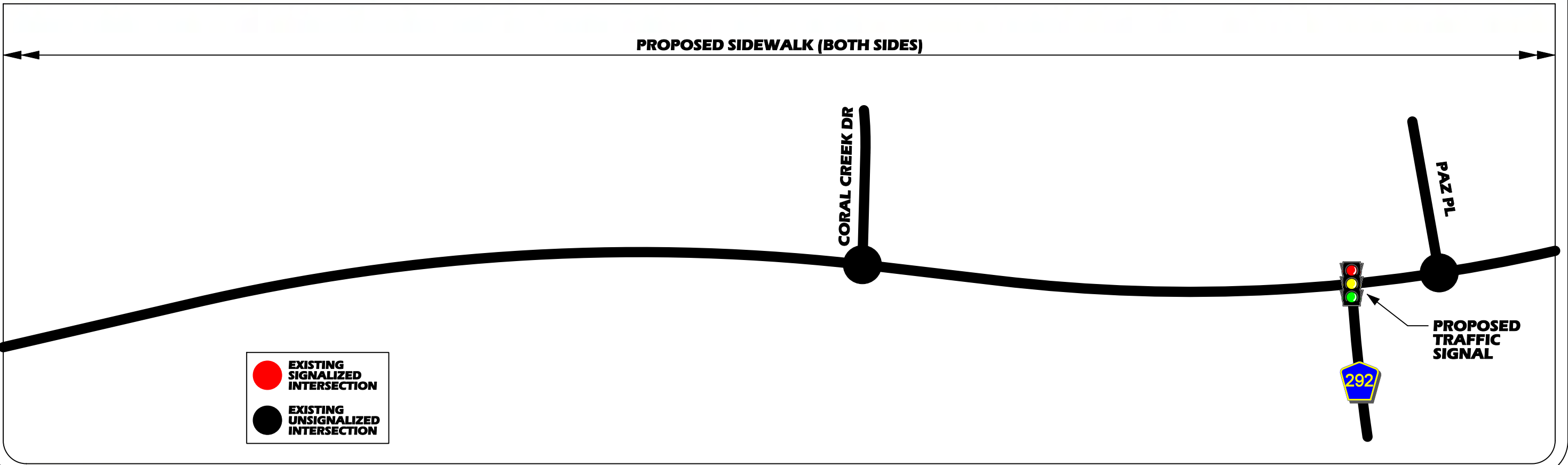
The results of the Synchro analysis reveal that the intersections of SR 292 at Dog Track Road and SR 292 at Patton Drive are expected to fail without improvements (signalization). Additionally, the Northbound lane movement at SR 292 and Old Gulf Beach Highway (CR 292A) is expected to fail by 2017 without improvements. However, with signalization, all intersections are expected to function at a LOS of C or better and all lane movements are expected to function at a LOS of D or better.

Recommended roadway and corridor improvements are summarized in the following table and plan sheets.

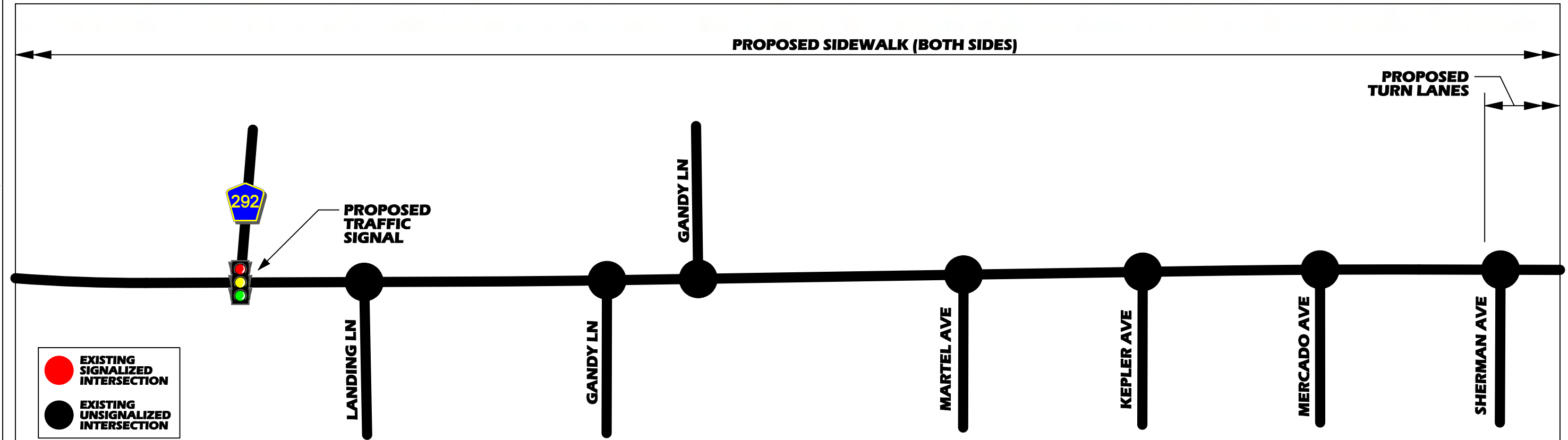
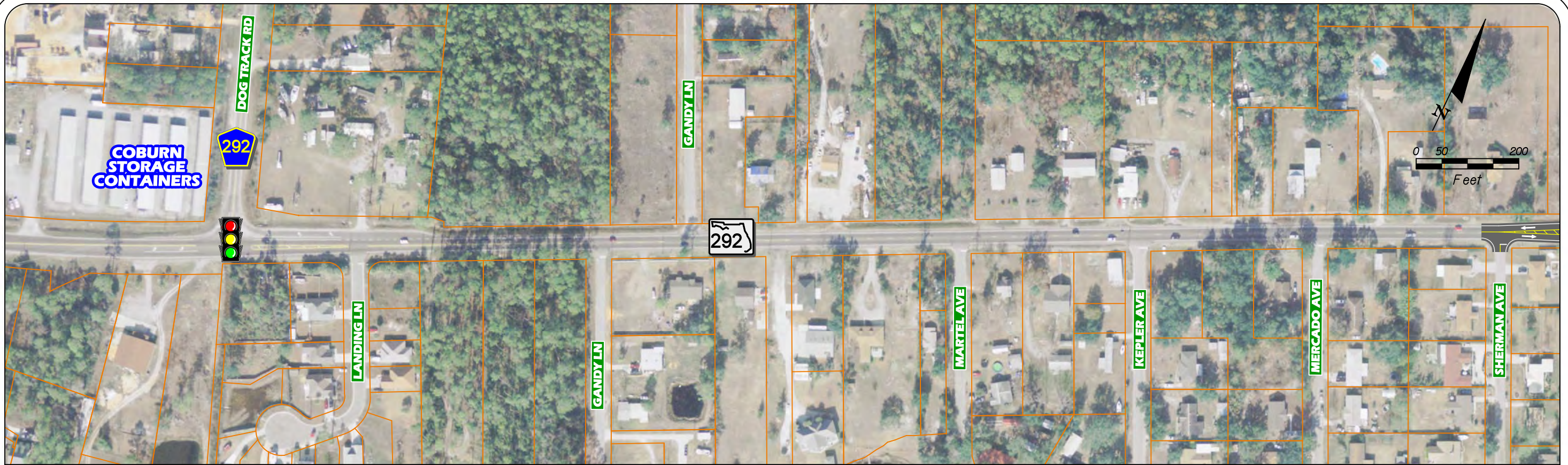
Near-Term Improvements	
Signalization Projects	Intersection
	SR 292 at Dog Track Road
	SR 292 at Patton Drive
	SR 292 at Old Gulf Beach Highway
Realignment of Patton Drive at Gulf Beach Highway	
Construction of sidewalks from Patton Drive to Blue Angel Parkway	
Signal retiming – SR 292 at Navy Boulevard	
Safety Improvements – Fairfield Drive at SR 292 (Dedicated left turn lane)	
Trimming of trees and foliage to improve sight lines at the intersections of SR 292 and Atlanta Avenue, Augusta Avenue and Bainbridge Avenue	
Construction of turn lanes at SR 292 and Wade Avenue	
Long-Term Improvements	
Intersection Modifications at SR 292 and Navy Boulevard	
Widening of SR 292 to 3 lanes from the end of the current 3 lane section to San Marcos Camino Road	

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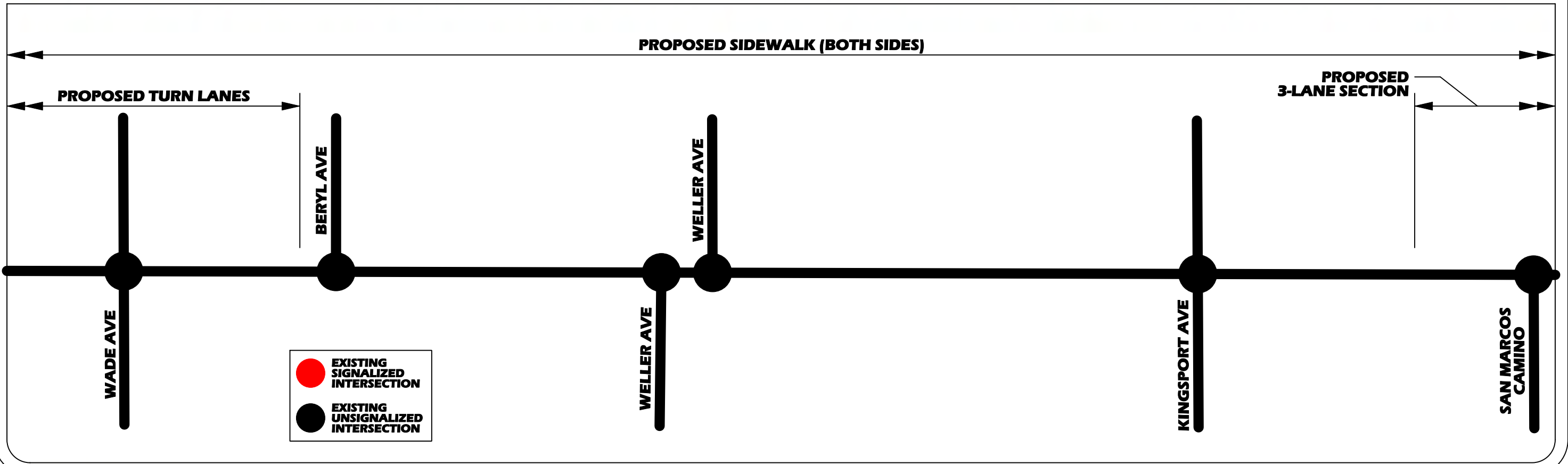
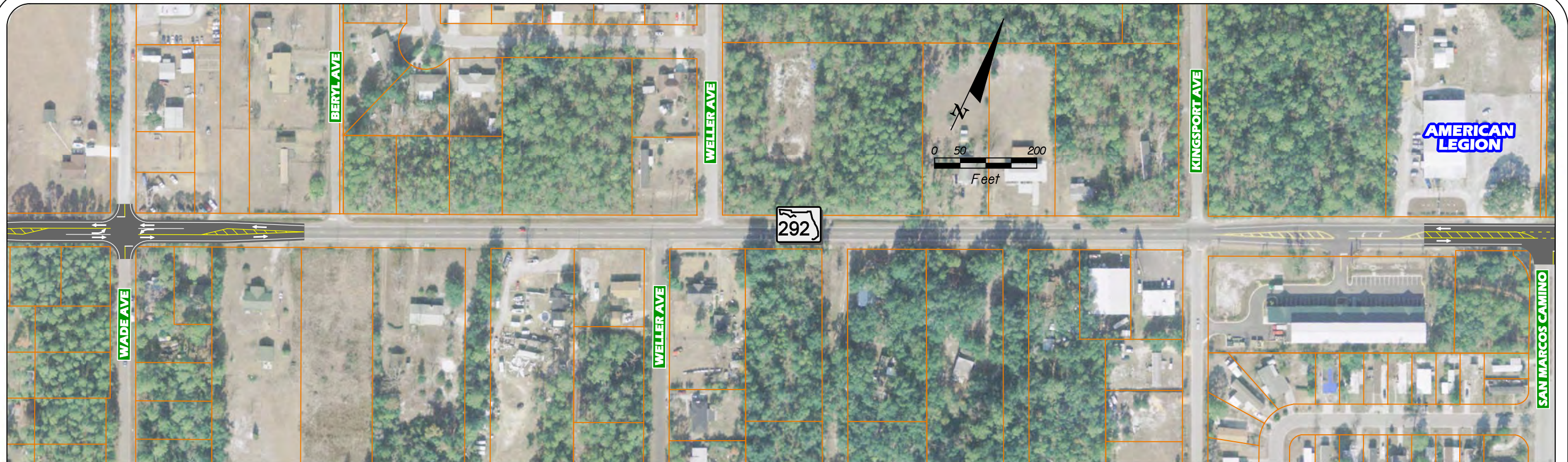




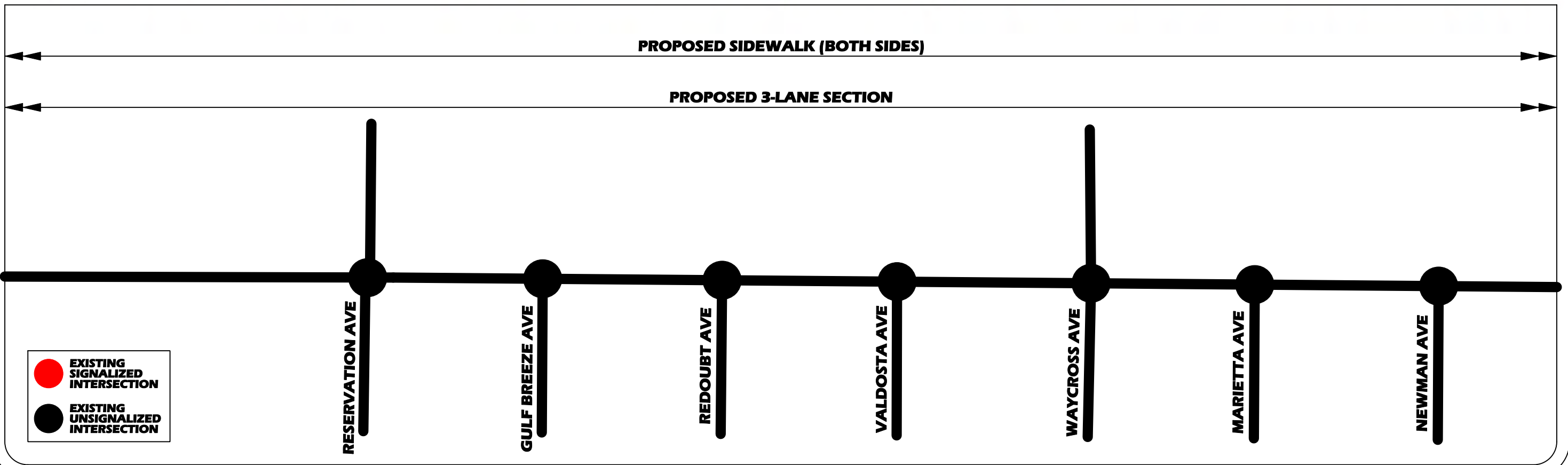
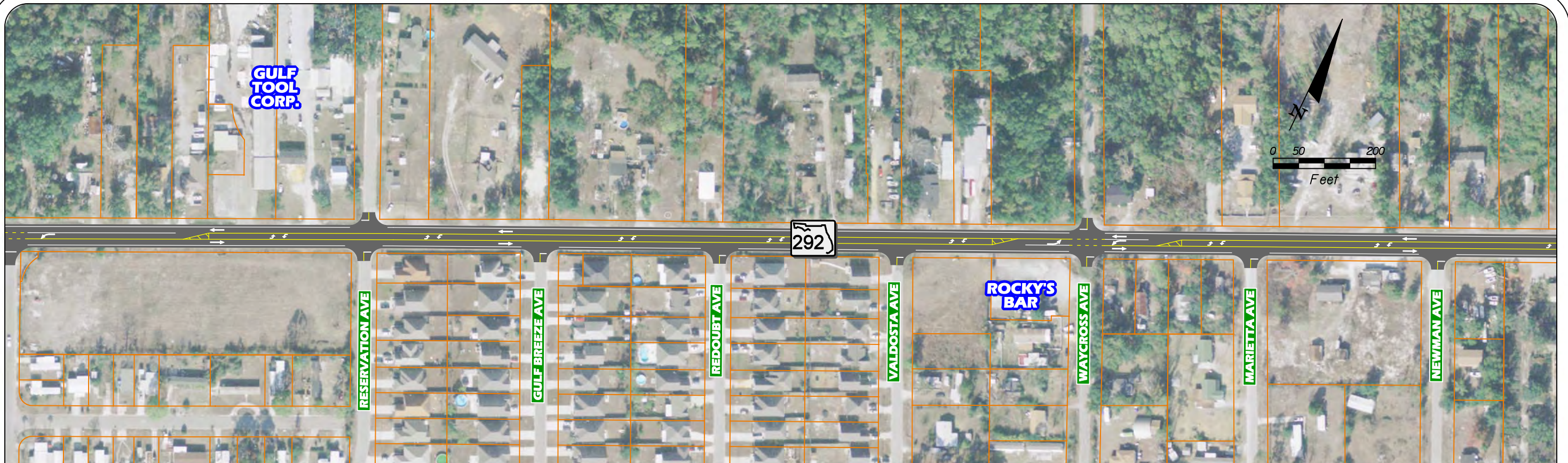
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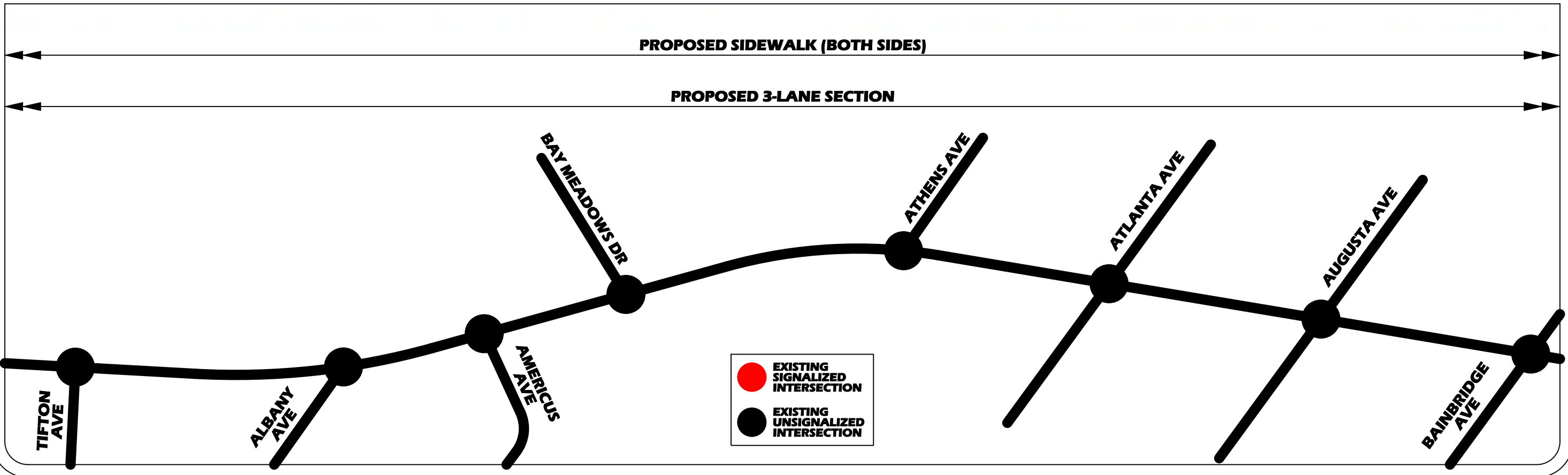


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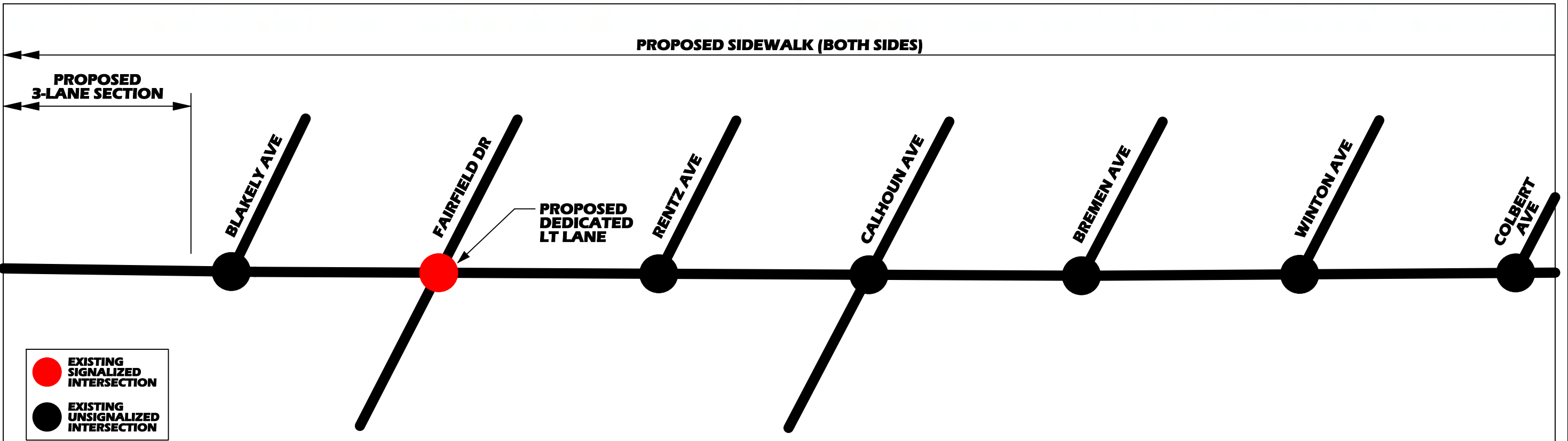
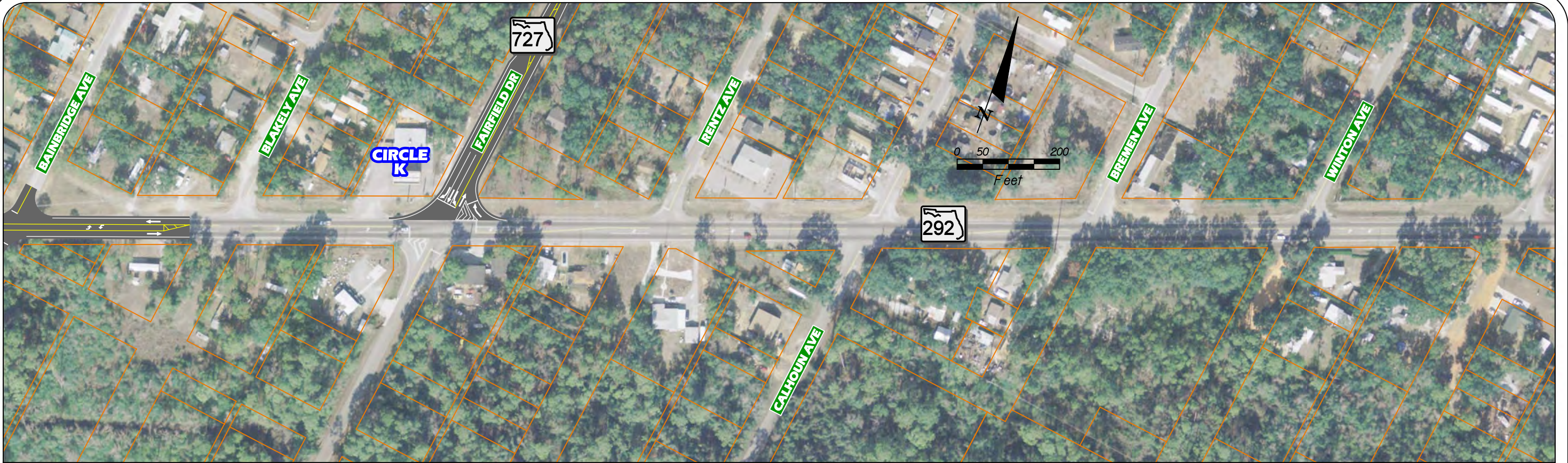


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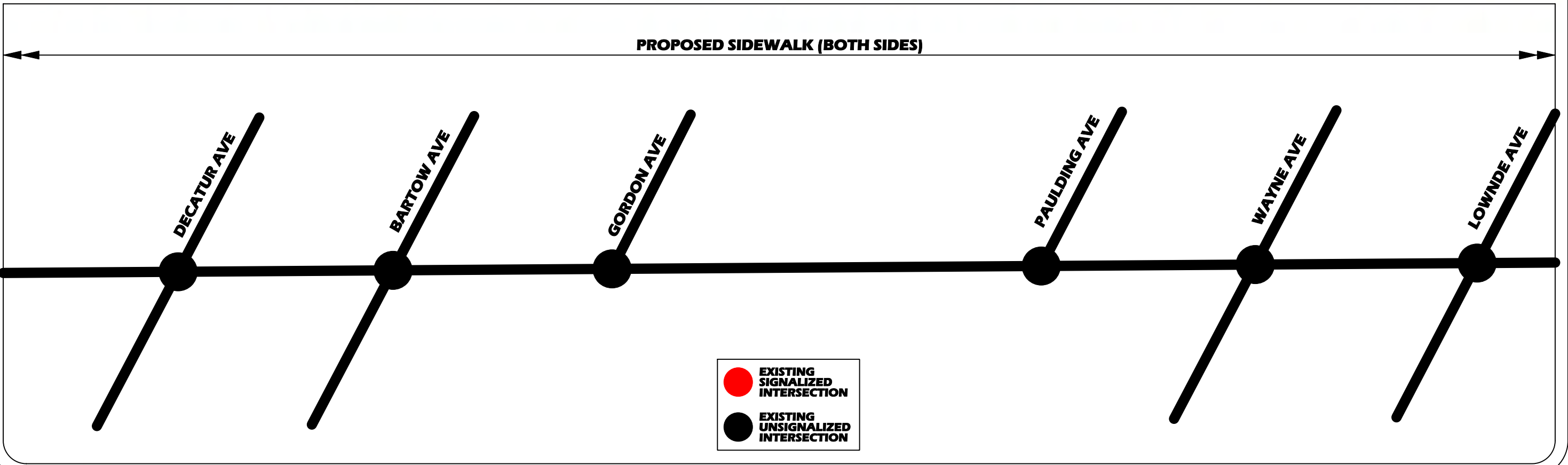




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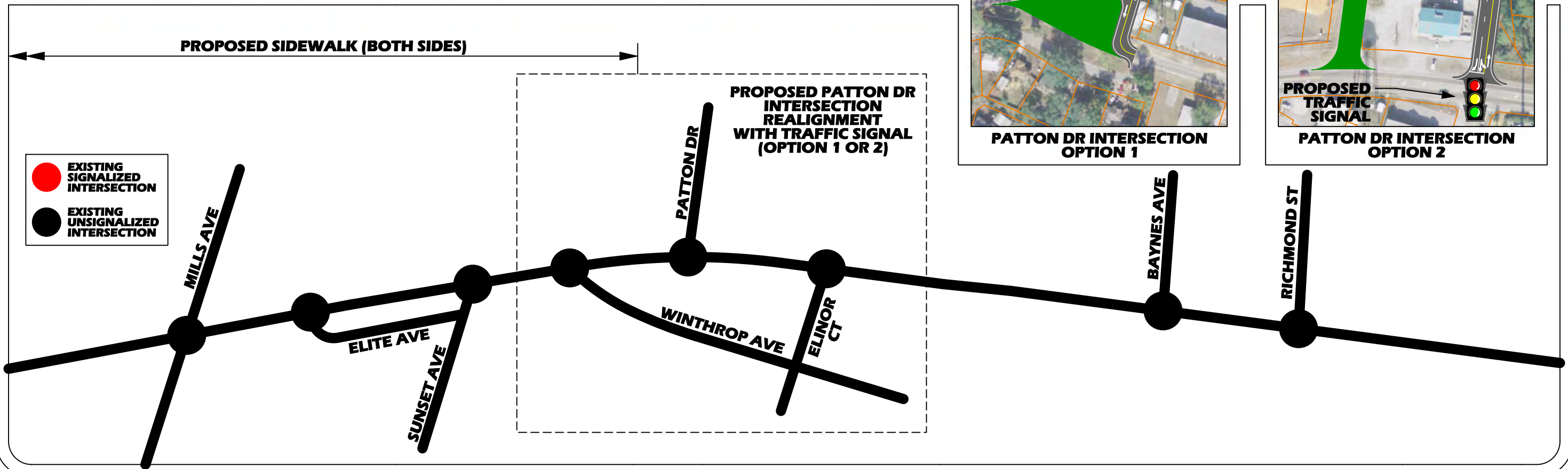
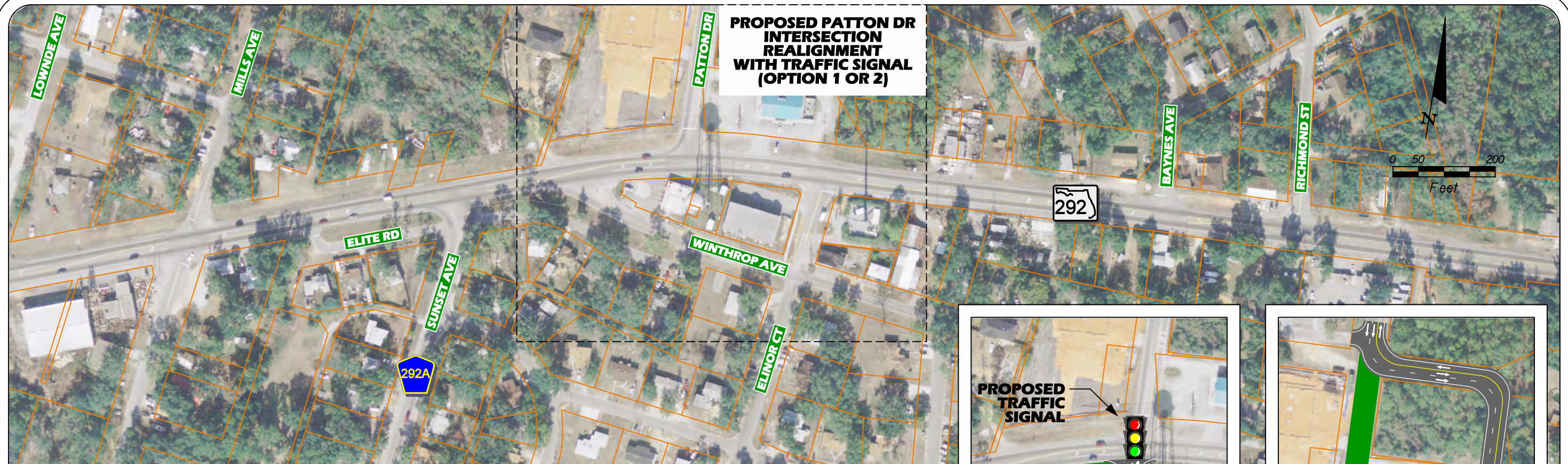


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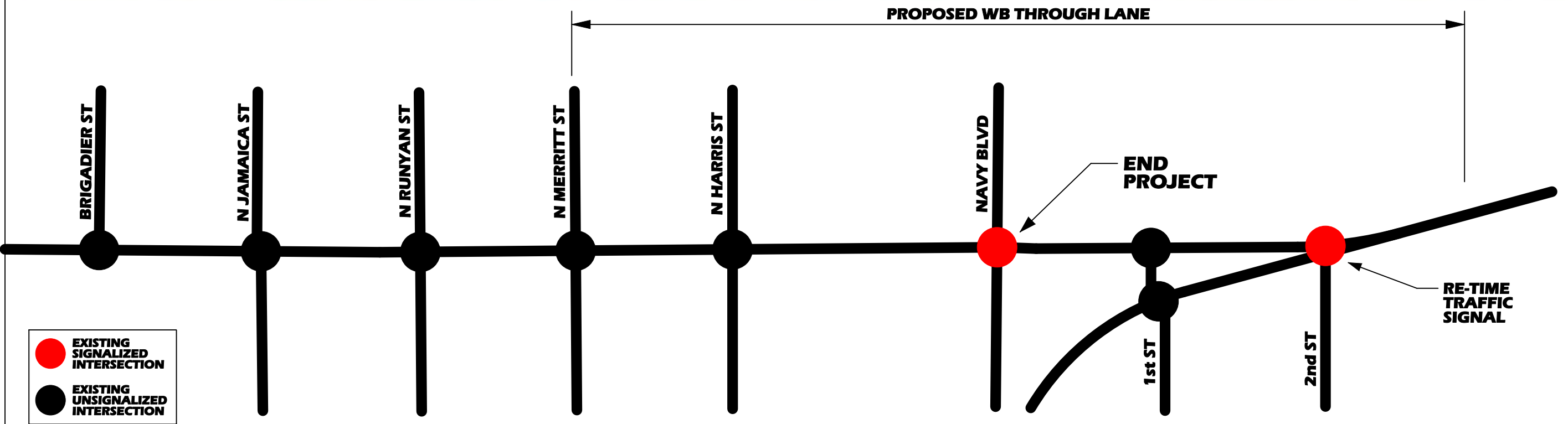
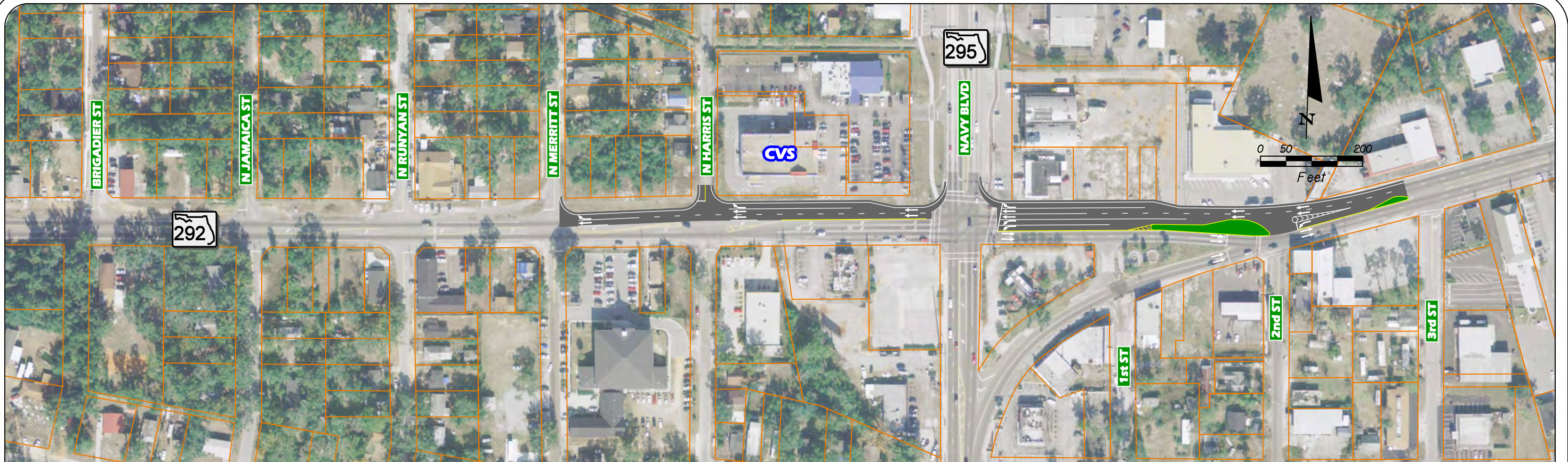


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I. INTRODUCTION

In July 2009, the Florida-Alabama TPO commissioned PBS&J to prepare a CMP for SR 292 from Blue Angel Parkway to Navy Boulevard. The purpose of this report is to identify problem areas along the corridor and to recommend potential improvements that would increase safety while preserving mobility and accessibility for all modes of transportation along the corridor. This report is also tasked with recommending land development code changes and/ or additions for the corridor.

Gulf Beach Highway/Sorrento Road (SR 292) runs from Perdido Key Drive to Navy Boulevard (SR 295). This report focuses on the segment of SR 292 from Blue Angel Parkway to Navy Boulevard which is approximately 5.2 miles long. This segment runs parallel to US 98 on the southern side. SR 292 is a prominent east-west southern corridor in Escambia County with close proximity to the Pensacola Naval Air Station. Figure 1-1 illustrates the study corridor location.

Within the limits of the study corridor, SR 292 is a two-lane facility. It is classified as an undivided arterial from Blue Angel Parkway to Fairfield Drive, and a divided arterial from Fairfield Drive to Navy Boulevard. The current roadway design is rural in nature, with sparse bicycle and pedestrian facilities, limited paved shoulders, sections of pavement in poor condition, and no curb and gutter. Additionally, driveway locations along the corridor are poorly defined at many locations.

This CMP is designed to address the accessibility and mobility of the Corridor; to inventory and analyze current and future year conditions and needs of the corridor; and to identify operational and access management improvements that will improve the functionality and safety of the Corridor.

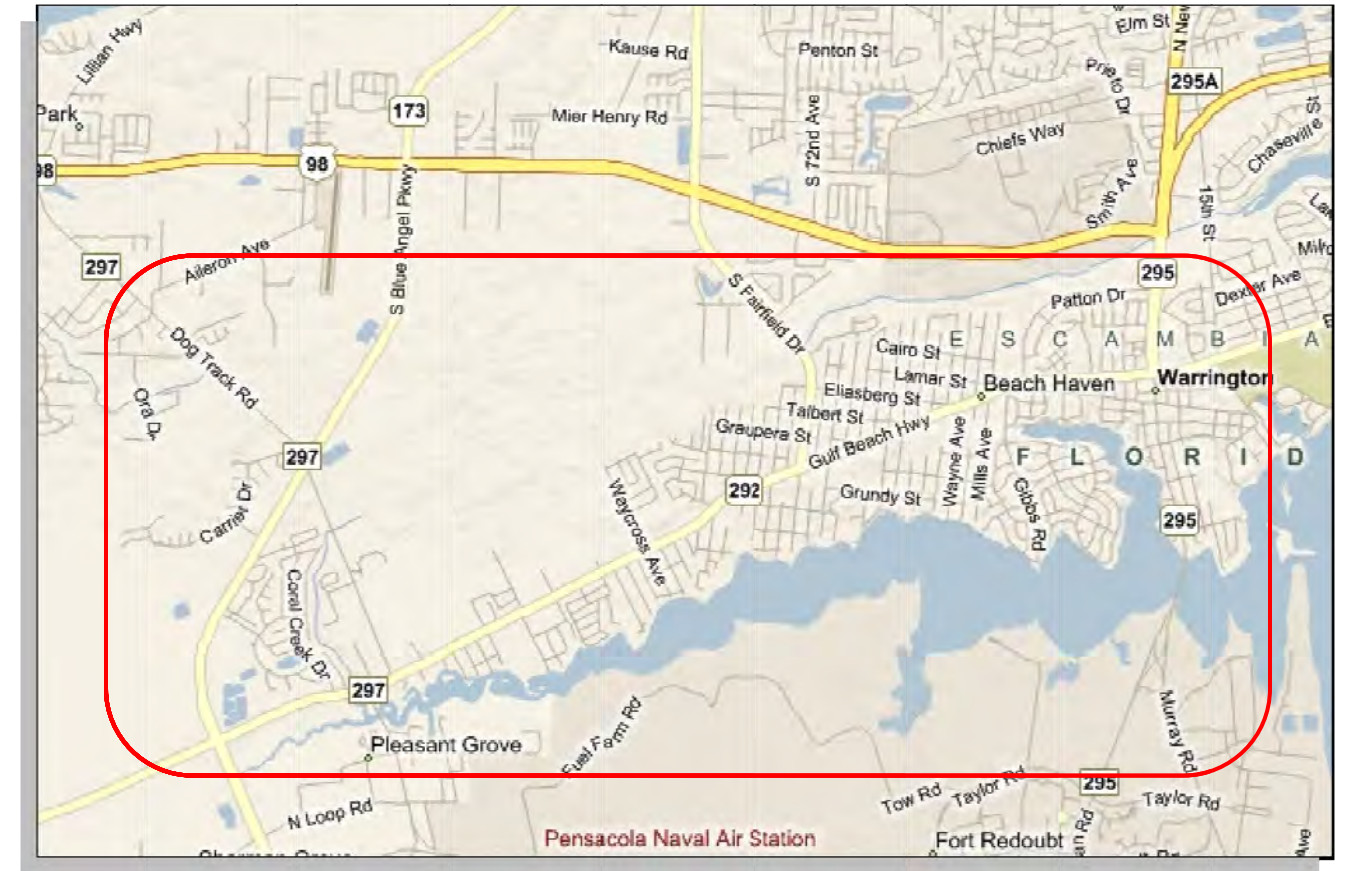


FIGURE 1-1 STUDY CORRIDOR LOCATION

II. DATA COLLECTION

Traffic Counts

Four, 24-hour tube counts were collected throughout the corridor during typical weekdays. These counts were converted to average annual daily traffic (AADT) using a seasonal adjustment factor specific to Escambia County. These counts were also used to identify the peak hour periods.

Turning Movement Counts

AM and PM peak hour turning movement counts (TMCs) were collected for four intersections, both signalized and unsignalized. These counts were used in the intersection capacity analysis in order to determine the operational level of service (LOS) for the study intersections.

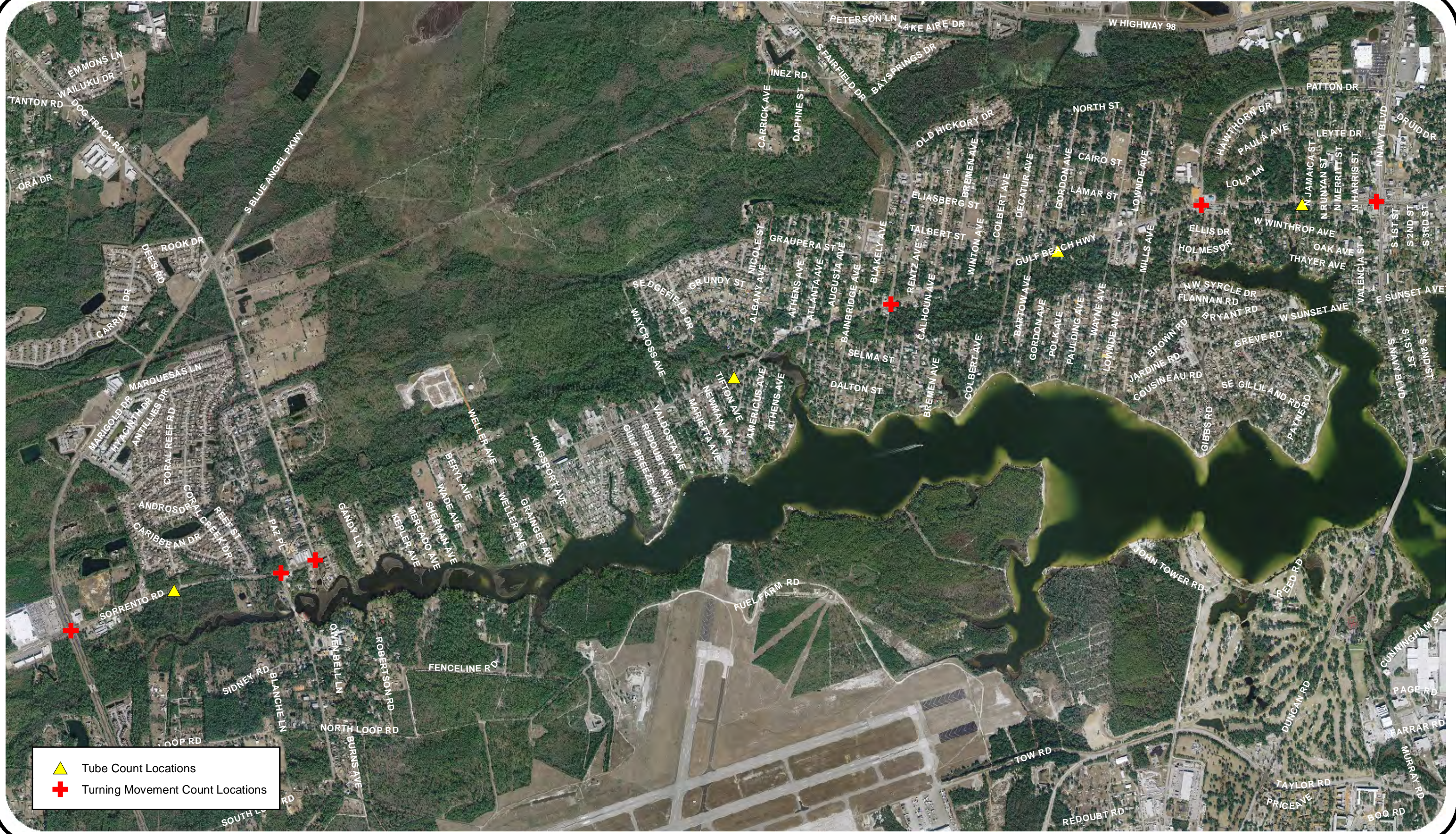
Tube counts and TMCs locations are illustrated in Figure 2-1 and the raw traffic counts and TMCs are summarized in Appendix A.


Other Data


In addition to traffic data, various other data was collected throughout the corridor in order to assist with the study. Some of this data included aerial photography as well as relevant GIS data (parcel data, right-of-way, utility easements). Speed limits, lane widths, intersection geometries, bicycle and pedestrian facilities, median and turn lane data as well as signal timings were all field-verified.

Future corridor plans and improvements relevant to the corridor were obtained from both the FDOT as well as the Florida-Alabama TPO.

Date



 Tube Count Locations

 Turning Movement Count Locations

III. EXISTING CONDITIONS

Park-and-Ride lot is not available adjacent to SR 292, there is a lot located on the corner of Navy Boulevard and Patton Drive. Figure 3-3 shows all transit routes serving the SR 292.

Corridor Description

Between Blue Angel Parkway and Navy Boulevard, SR 292 is a two-lane facility. It is classified as an undivided arterial from Blue Angel Parkway to Fairfield Drive, and a divided arterial from Fairfield Drive to Navy Boulevard. The current roadway design is rural in nature, with limited paved shoulders, sections of pavement in poor condition, and no curb and gutter. Additionally, driveway locations along the corridor are poorly defined.

Land Use

Along the Corridor, there is a mixture of residential and commercial land uses. However, to the west of Fairfield Drive are primarily residential uses, and to the east of Fairfield Drive are primarily commercial uses. Navy Point Elementary is located on Patton Drive one block from SR 292. The Pensacola Naval Air Station is located to the south of the Corridor, at some points only one mile away. Figures 3-1 and 3-2 show land uses along the Corridor.

Bicycle, Pedestrian, and Transit Facilities

Sidewalks have been constructed along SR 292 from Patton Drive to Navy Boulevard. While no designated bike lanes exist on the Corridor, paved shoulders are present between Dog Track Road and Navy Boulevard.

The Escambia County Area Transit (ECAT) serves the Corridor Route 55. Route 55 provides eastbound service along SR 292 from Fairfield Drive, with the bus turning north at Brigadier Street. Route 55 provides one-hour headways during the week and two-hour headways for the weekend. Route 62 provides seasonal service from May through Labor Day on Friday's Saturdays and Sundays. Route 58 serves Blue Angel Parkway and Navy Boulevard. While a

Right of Way (ROW)

Measurements of the SR 292 Corridor ROW within the study corridor fluctuate between approximately 65 feet and 100 feet. At Blue Angel Parkway, the roadway ROW is approximately 100 feet, but narrows to 65 feet by Dog Track Road. By Fairfield Drive, the roadway ROW again measures around 100', and at Navy Boulevard the ROW is also approximately 100'. Figure 3-3 and 3-4 illustrate ROW boundaries for the area.



Hurricane Evacuation

The Escambia County Office of Emergency Management has designated SR 292 as an official Hurricane Evacuation Route. This route serves the southwest portion of the County as well as Perdido Key. Additionally, Blue Angel Parkway and Navy Boulevard are also Hurricane Evacuation Routes from their intersections with SR 292 to the north. Furthermore, Escambia County Emergency Information Mapping Service data show that Category 1 through 5 Hurricane Storm Surge Zones intersect with the SR 292 Corridor.



Source: Escambia County Emergency Management

Capacity Analyses

Both roadway capacity analyses and intersection analyses were performed for the SR 292 Corridor. The intersection analyses included five intersections along the corridor (2 signalized, 3 unsignalized).

Roadway Capacity Analysis

A capacity analysis was performed for the Corridor in order to determine existing roadway level of service (LOS) and to identify existing deficiencies. Annual average daily traffic counts taken from the 2008 FDOT published traffic counts and peak-Hour directional volumes were used for the analysis in Table 3-1. Additionally, daily traffic counts were collected in September 2009 and factored with the FDOT seasonal adjustment factor and axle factor, and these counts are shown in Table 3-2. The FDOT Generalized Level of Service Tables were used for these analyses in order to determine LOS.

As shown in Table 3-1 and 3-2, SR 292 from Fairfield Drive to Navy Boulevard is currently operating at a failing level of service at both the daily level (AADT) and during the peak hour in the westbound direction. All other roadway segments are currently operating at or above the adopted LOS standard.

Intersection Analysis

An operational capacity analysis was performed on all major intersections for the afternoon peak hours. Intersection capacity analyses for both signalized and unsignalized intersections were performed using Synchro software. Synchro applies the methodology from the Highway Capacity Manual to determine intersection delay and LOS based on a number of input variables including:

- Lane Configuration
- Turning Movement Counts
- Intersection Geometry
- Signal timings (signalized intersections)

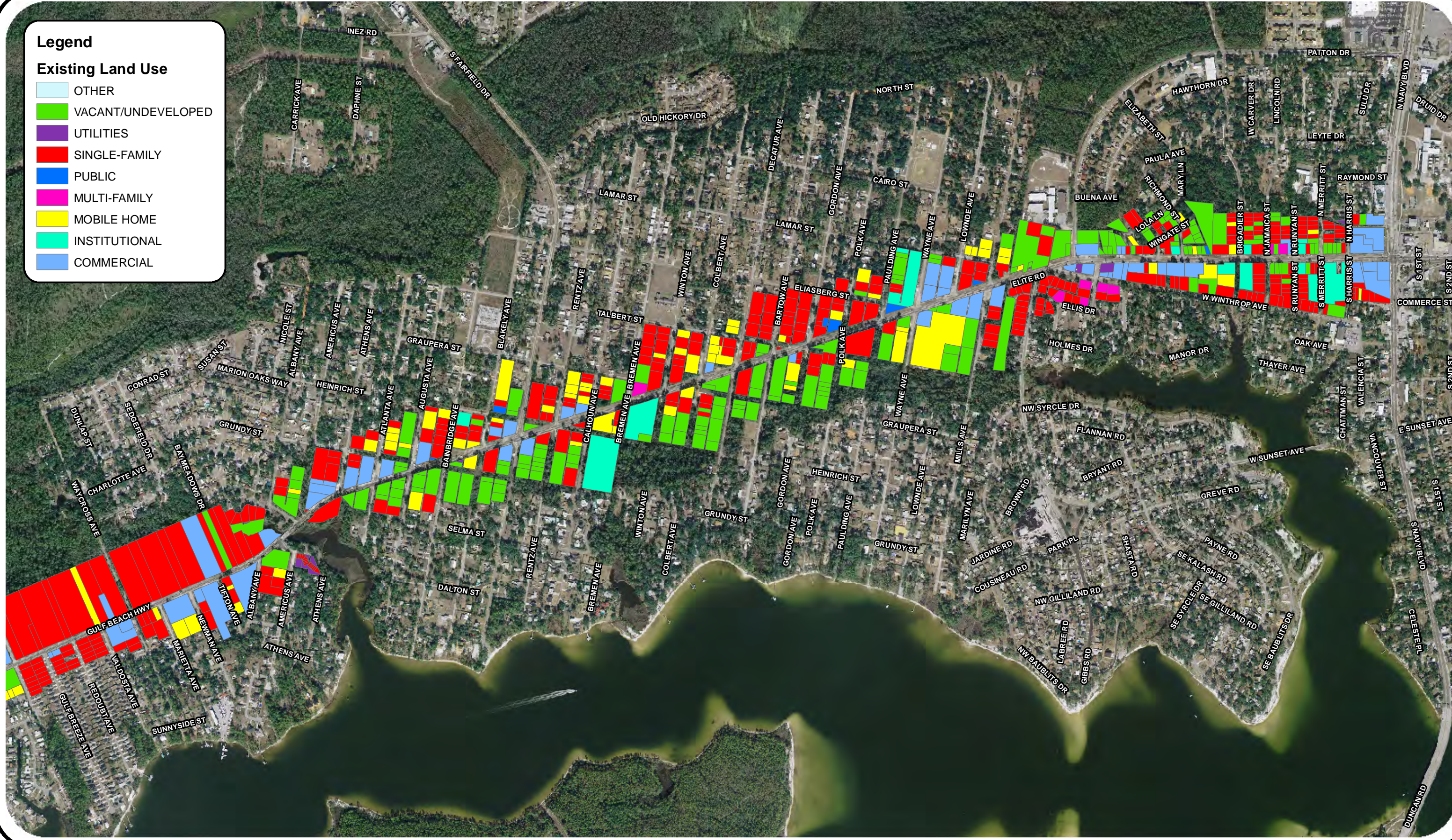
Analyses were performed for 2009 existing conditions, 2017 future conditions with no improvements, and 2017 future conditions with improvements. The results of the 2009 existing conditions Synchro analysis are summarized in Table 3-3 and Table 3-4. Figure 3-5 illustrates intersection level of service for all intersections analyzed on the corridor. Synchro software reports are summarized in Appendix B.

The results of the Synchro analysis reveal that the intersection of SR 292 at Dog Track Road operates at LOS E during the PM peak hours. The intersection of SR 292 at Patton Drive also currently operates at LOS E during the PM Peak Hours.

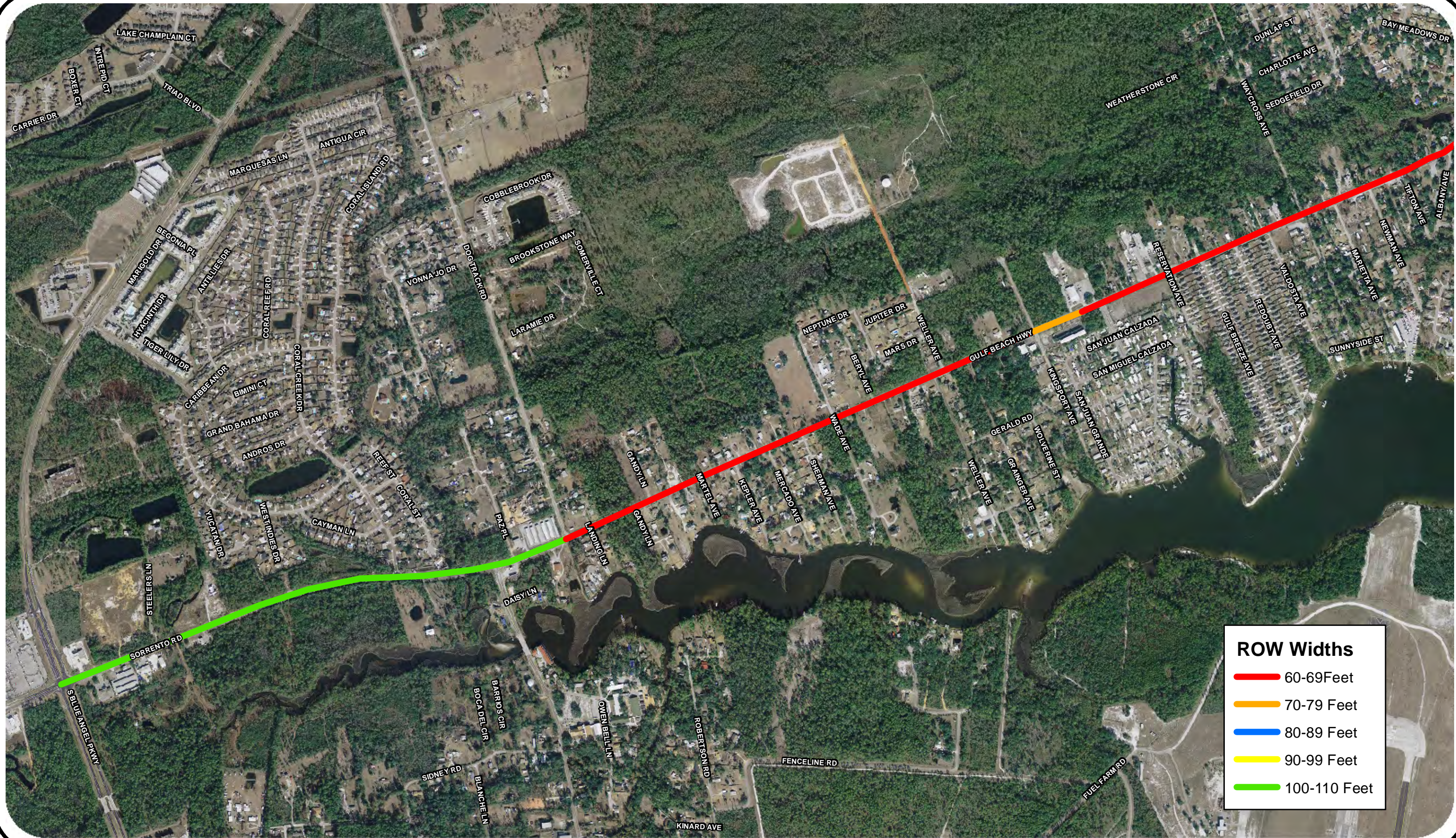
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Existing Land Use

- OTHER
- VACANT/UNDEVELOPED
- UTILITIES
- SINGLE-FAMILY
- PUBLIC
- MULTI-FAMILY
- MOBILE HOME
- INSTITUTIONAL
- COMMERCIAL



Date



Florida-Alabama
TPO
Transportation Planning Organization



Right of Way Boundaries Blue Angel Parkway to Waycross Avenue

SR 292 Corridor Management Plan

Figure 3-3

Date



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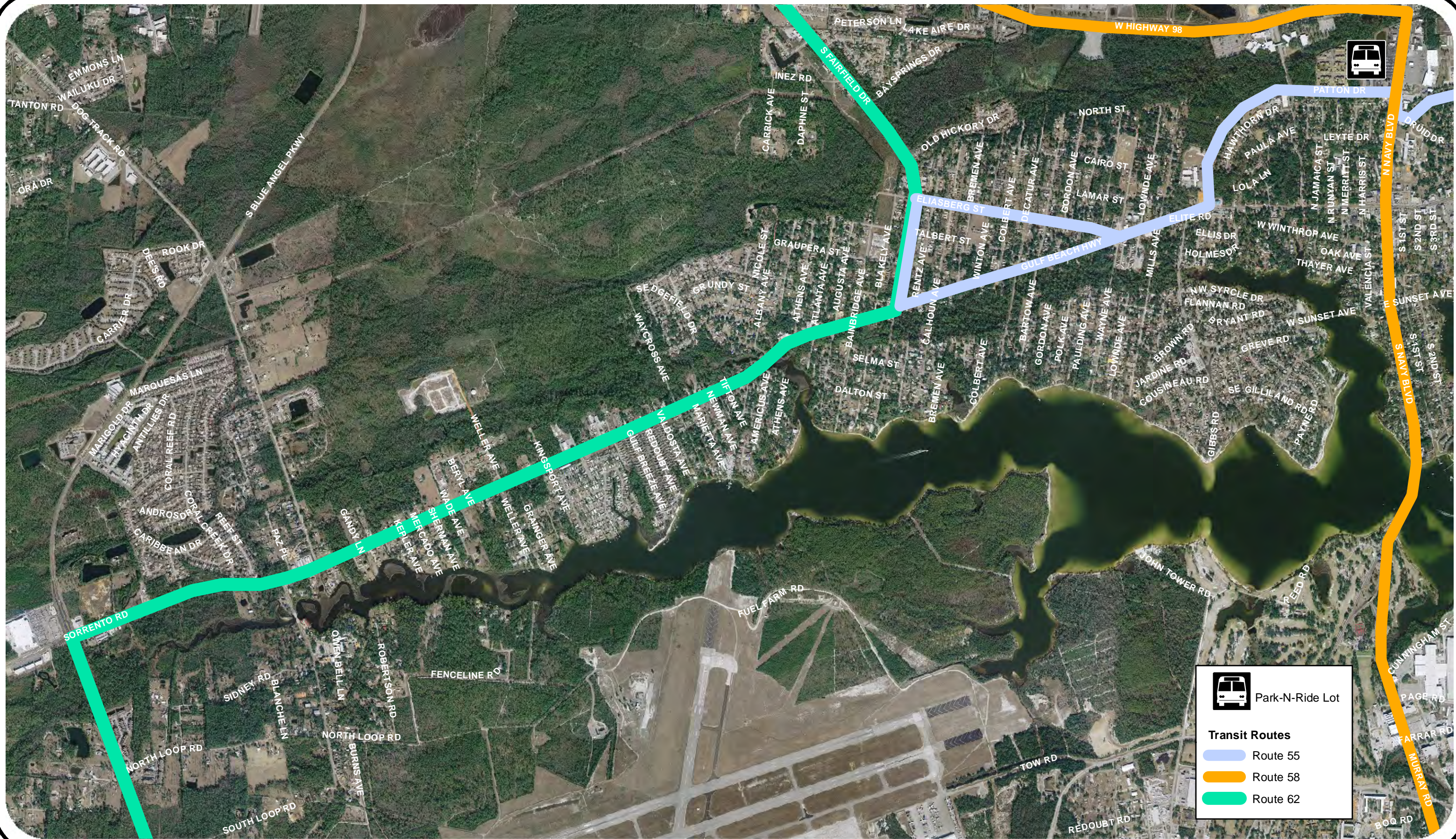


Right of Way Boundaries Waycross Avenue to Navy Boulevard

SR 292 Corridor Management Plan

Figure 3-4

Date



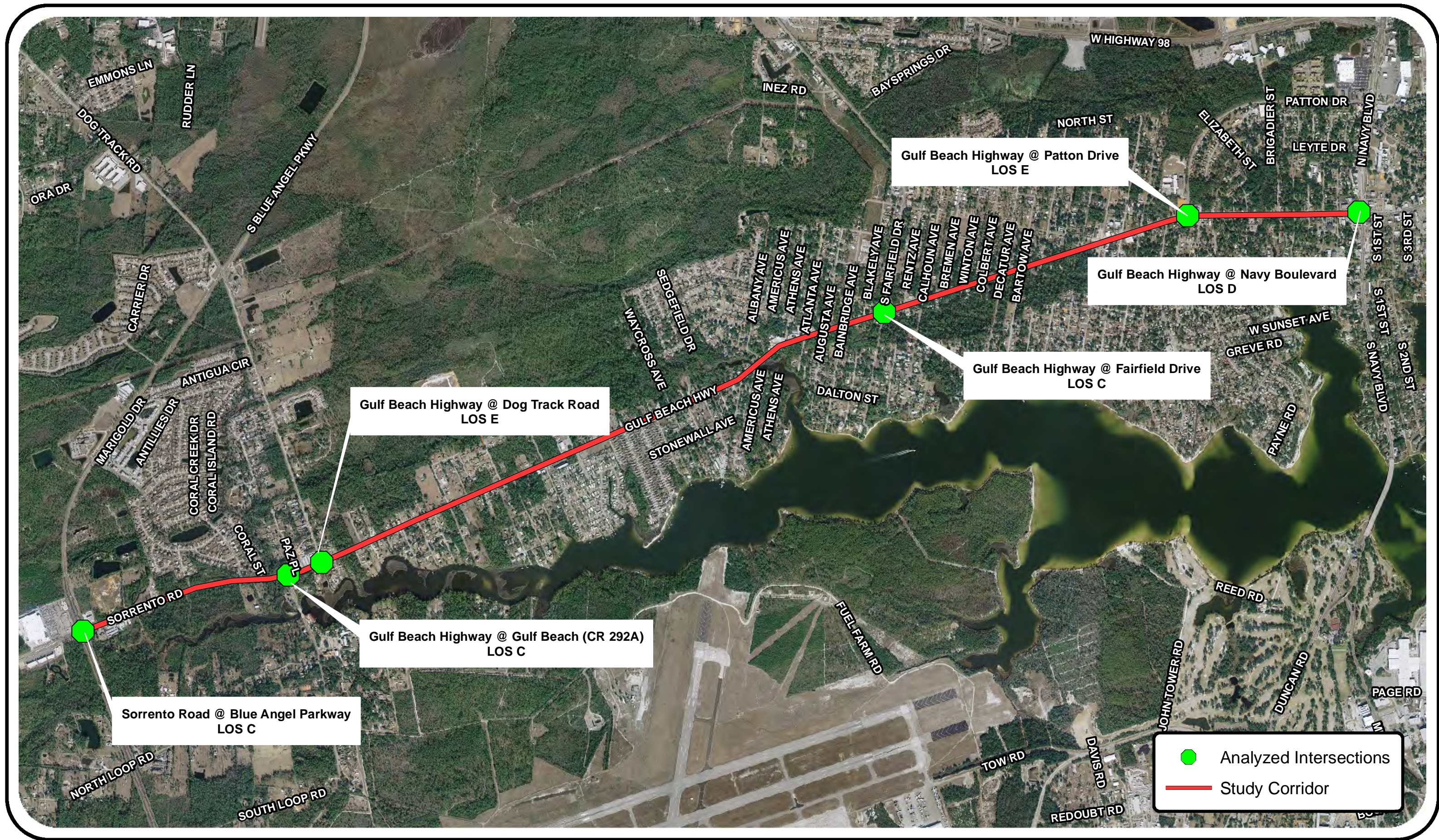


Table 3-1 Existing Conditions Analysis
2008 FDOT Traffic Counts

Road Name	Number of Lanes	Facility Type	Number of Signals	Signals Per Mile	Segment Length	LOS Area	Directional Peak Hour Max Vol. and LOS Standard	Count Year	AADT	AADT LOS	K Factor	D Factor	Peak Hour Two-Way Traffic	Directional Peak Hour Traffic Volumes				Directional Peak Hour Traffic LOS			
Sorrento Road																					
Doug Ford Road to Blue Angel Parkway	2	Undivided	2	0.46	4.31	Urbanized	880 (D)	2008	15,500	D	9.42%	55.96%	1,460	643	EB	817	WB	C	EB	C	WB
Gulf Beach Highway																					
Blue Angel Parkway to Gulf Beach Hwy. (CR)	2	Undivided	0	0	0.82	Urbanized	880 (D)	2008	10,000	C	10.13%	55.96%	1,013	446	EB	567	WB	B	EB	C	WB
Gulf Beach Hwy. (CR) to Fairfield Drive	2	Undivided	1	0.4	2.51	Urbanized	880 (D)	2008	16,400	D	9.42%	56.46%	1,545	673	EB	872	WB	C	EB	D	WB
Fairfield Drive to Navy Boulevard	2	Divided	1	0.53	1.9	Urbanized	924 (D)	2008	19,500	F	9.42%	56.46%	1,837	800	EB	1037	WB	C	EB	F	WB

Table 3-2 Existing Conditions Analysis
2009 Collected Traffic Counts

Road Name	Number of Lanes	Facility Type	Number of Signals	Signals Per Mile	Segment Length	LOS Area	Directional Peak Hour Max Vol. and LOS Standard	Count Year	AADT*	AADT LOS	K Factor**	D Factor**	Peak Hour Two-Way Traffic	Directional Peak Hour Traffic Volumes				Directional Peak Hour Traffic LOS			
Gulf Beach Highway																					
Blue Angel Parkway to Gulf Beach Hwy. (CR)	2	Undivided	0	0	0.82	Urbanized	880 (D)	2009	10,091	C	10.13%	55.96%	1,022	450	EB	572	WB	B	EB	C	WB
Gulf Beach Hwy. (CR) to Fairfield Drive	2	Undivided	1	0.4	2.51	Urbanized	880 (D)	2009	16,401	D	9.42%	56.46%	1,545	673	EB	872	WB	C	EB	D	WB
Fairfield Drive to Navy Boulevard	2	Divided	1	0.53	1.9	Urbanized	924 (D)	2009	19,477	F	9.42%	56.46%	1,835	799	EB	1036	WB	C	EB	F	WB

*Raw traffic count factored with seasonal adjustment factor and axle adjustment factor from 2007 FTI DVD.

**2008 Factors published by FDOT.

Table3-3 Synchro Intersection Analysis
2009 PM Peak Hour Intersection Existing Conditions

Intersection	2009 Existing PM Peak LOS
Sorrento Rd @ Blue Angel Pkwy	C
Sorrento Rd @ Gulf Bch Hwy (CR 292A)	C
Gulf Beach Hwy @ Dog Track Rd	E
Gulf Beach Hwy @ Fairfield Dr	C
Gulf Beach Hwy @ Patton Dr	E
Gulf Beach Hwy @ Navy Boulevard	D

Table 3-4 Synchro Intersection Analysis
2009 PM Peak Hour Lane Movement Existing Conditions

Intersection	Lane Movement											
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Sorrento Rd & Blue Angel Pkwy	B	C	B	B	C	C	C	C	C	C	C	C
Sorrento Rd & Gulf Bch Hwy (CR 292A)	N/A	N/A*	N/A*	A	N/A*	N/A	E	N/A	B	N/A	N/A	N/A
Gulf Bch Hwy & Dog Track Rd	A	N/A*	N/A	N/A	N/A*	N/A*	N/A	N/A	N/A	E	N/A	E
Gulf Bch Hwy & Fairfield Dr	B	A	A	A	C	C	C	C	C	D	D	C
Gulf Beach Hwy & Patton Dr	B	N/A*	N/A	N/A	N/A*	N/A*	N/A	N/A	N/A	E	N/A	N/A*
Gulf Beach Hwy & Navy Boulevard	E	D	D	E	E	C	C	D	D	E	C	C

N/A = Not Applicable; Lane Movement not found in intersection
N/A* = LOS is not assigned by Synchro

Ongoing Corridor Projects

The SR 292 Corridor from CR 292A / CR 291 to SR 295 / Navy Boulevard is being resurfaced. This project has \$4.8 million in Construction Funds in the FDOT Work Program for 2009, and has had \$1.1 million for Preliminary Engineering in the FDOT Work Program between 2005-2009.



Additionally, SR 292 at CR 292-A / Sunset Avenue will be signalized. At this time, design for this signal is underway.

Planned Corridor Projects

As part of the SR 292 CMP, projects currently planned for the corridor were identified. Agencies involved with these projects include FDOT and the Florida-Alabama TPO.

FDOT 5-Year Work Program

FDOT has two projects currently listed in the FDOT 5-Year work program for the study area: the addition of left turn lanes at the Waycross Avenue intersection in 2010, and the addition of turn lanes from SR 173 / Blue Angel Parkway to SR 295 / Navy Boulevard in 2012. Table 3-3 summarizes projects that are currently listed in the FDOT 5-year work program for fiscal years 2010-2014.

Table 3-3 SR 292 Projects Currently in FDOT Work Program

Description	Type of Work	Phase	Funding Year(s)
SR 292 @ Waycross Avenue Intersection	Add Left Turn Lane(s)	Preliminary Engineering, Construction, Construction Support	2010
SR 292 from SR 173 / Blue Angel Pkwy to SR 295 / Navy Blvd	Add Turn Lane(s)	Preliminary Engineering	2012

Florida-Alabama TPO

The TPO currently has two projects for SR 292, from Blue Angel Parkway to Navy Boulevard, in its Fiscal Year 2010-2014 Transportation Improvement Program, which is the five year plan for transportation improvements to be made in the study area. The first is a capacity project to add turn lanes and develop this Corridor Management Plan from SR 173 / Blue Angel Parkway to SR 295 / Navy Boulevard. The second is a transportation system management project to add left turn lanes at the Waycross Avenue intersection. These projects are shown below in Table 3-4.

In the 2025 Florida – Alabama TPO Long Range Transportation Plan, SR 292 is found in both the Needs Assessment and in the Cost Feasible Plan. The Needs Assessment identifies the need for SR 292 to be four-laned from the Alabama State Line to Navy Boulevard. However, the Cost Feasible Plan includes the four-laning of SR 292 from the Alabama State Line to Blue Angel Parkway only. This would leave the portion of SR 292 between Blue Angel Parkway and Navy Boulevard as the only segment not to be four-laned.

Table 3-4 Florida-Alabama TPO Project Priorities for SR 292 Corridor

Funding Year	Roadway	Location	Improvement
FY 2011/12	SR 292	SR 173 / Blue Angel Pkwy to SR 295 / Navy Boulevard	Add turn lanes – Corridor Management Plan Development
FY 2009 / 10	SR 292	At Waycross Avenue intersection	Add left turn lane(s)

IV. 2017 FUTURE CONDITIONS ANALYSIS

Traffic Forecasting Methodology

In order to identify future transportation deficiencies on the SR 292 Corridor, traffic counts were forecast to the year 2017. This was accomplished using the FDOT Traffic Trends (V2.0) software. This software examines historical traffic counts and calculates a growth factor that can be applied to current traffic counts in order to forecast traffic to the future study year. For the study corridor, five FDOT traffic count stations (three between Blue Angel Parkway and Fairfield Drive and two between Fairfield Drive and Navy Boulevard) were used to provide historical traffic count data for the Corridor, which were then entered into the Trends software. These count stations provided a growth rate of 1.59% between Blue Angel Parkway and Fairfield Drive, and a 0.56% growth rate between Fairfield Drive and Navy Boulevard. Typically, a minimum growth rate of 2% is used to forecast future traffic growth. Therefore, a 2% growth rate was then used to forecast current year traffic data to the study year of 2017.

2017 Roadway Capacity Analysis

The 2% growth rate was applied to the 2008 FDOT traffic counts for the Sorrento Road segment from Doug Ford Drive to Blue Angel Parkway, and to the 2009 collected traffic counts for the two Gulf Beach Highway segments. This growth rate was applied in order to determine future year level of service (LOS) and to identify potential future deficiencies. As was performed in the existing conditions analysis, Peak-Hour directional traffic volumes were used for the analysis. The results of the future conditions analysis are summarized in Table 4-1.

In 2017, the Gulf Beach Highway segment from Fairfield Drive to Navy Boulevard is expected to operate at a failing level of service in both directions. SR 292 from Blue Angel Parkway to Old Gulf Beach Highway and SR 292 from Doug Ford Drive to Blue Angel Parkway are expected to operate at a failing level of service in the westbound direction. SR 292 from Blue Angel Parkway to Fairfield Drive is not anticipated to have any deficiencies by 2017.

2017 Intersection Analysis

The 2% growth rate was also applied to the 2009 turning movement counts that were collected for the study in order to identify future year intersection deficiencies. An operational capacity analysis was performed on all major intersection for the PM Peak Hours using Synchro.

The results of the future conditions analysis are summarized in Table 4-2 and 4-3. The intersections were analyzed in 2017 first with no improvements and then with signalization of the three currently unsignalized intersections: SR 292 at Gulf Beach Highway (CR 292A); SR 292 at Dog Track Road; and SR 292 at Patton Drive. Also included were geometric improvements to the intersection of SR 292 and Navy Boulevard. A more detailed analysis of this intersection can be found in the Addendum to this report. Figure 4-1 illustrates intersection level of service for all intersections analyzed on the corridor. The future conditions Synchro software reports are summarized in Appendix C.

The results of the Synchro analysis reveal that the intersections of SR 292 at Dog Track Road and SR 292 at Patton Drive are expected to fail without improvements (signalization). Additionally, the Northbound lane movement at SR 292 and Gulf Beach Highway (CR 292A) is expected to fail by 2017 without improvements. However, with signalization, all intersections are expected to function at a LOS of C or better and all lane movements are expected to function at a LOS of D or better.

Table 4-1 2017 Future Conditions Analysis with 2% Growth Rate

Road Name	Number of Lanes	Facility Type	Number of Signals	Signals Per Mile	Segment Length	LOS Area	Directional Peak Hour Max Vol. and LOS Standard	2017 AADT with 2% growth	2017 Peak Hour Two-Way Traffic	2017 Directional Peak Hour Traffic Volumes				2017 Directional Peak Hour Traffic LOS			
Sorrento Road																	
Doug Ford Drive to Blue Angel Parkway	2	Undivided	2	0.46	4.31	Urbanized	880 (D)	18,524	1,745	768	EB	976	WB	C	EB	F	WB
Gulf Beach Highway																	
Blue Angel Parkway to Gulf Beach Highway	2	Undivided	0	0	0.82	Urbanized	880 (D)	11,823	1,142	497	EB	645	WB	B	EB	C	WB
Gulf Beach Highway to Fairfield Drive	2	Undivided	1	0.4	2.51	Urbanized	880 (D)	19,216	1,856	808	EB	1048	WB	C	EB	F	WB
Fairfield Drive to Navy Boulevard	2	Divided	1	0.53	1.9	Urbanized	924 (D)	22,820	2,150	936	EB	1214	WB	F	EB	F	WB

Table 4-2 Synchro Intersection Analysis
2017 PM Peak Hour Intersection Existing Conditions

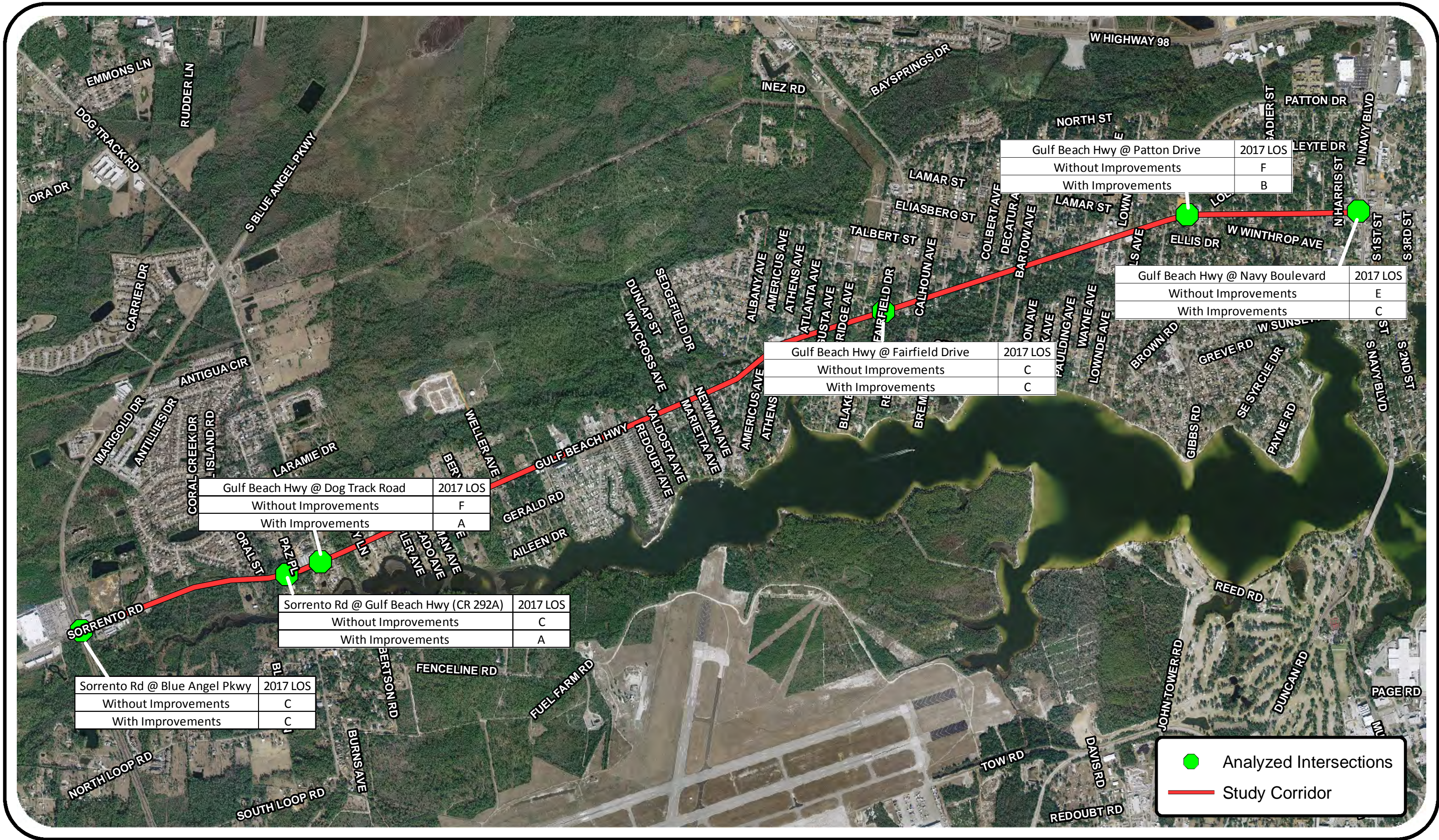
Intersection	2017 No Build PM Peak LOS	2017 Improved PM Peak LOS
Sorrento Rd @ Blue Angel Pkwy	C	C
Sorrento Rd @ Gulf Bch Hwy (CR 292A)	C	A
Gulf Beach Hwy @ Dog Track Rd	F	A
Gulf Beach Hwy @ Fairfield Dr	C	C
Gulf Beach Hwy @ Patton Dr	F	B
Gulf Beach Hwy @ Navy Blvd	E	C

Table 4-3 Synchro Intersection Analysis
2017 PM Peak Hour Lane Movement Future Conditions, with and without improvements

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Intersection:	Sorrento Road and Blue Angel Parkway											
2017 PM Peak, No Build	C	C	C	B	D	C	C	D	C	C	C	C
2017 PM Peak, With Improvements	C	C	C	B	D	C	C	D	C	C	C	C
Intersection:	Sorrento Road and Gulf Beach Highway (CR 292A)											
2017 PM Peak, No Build	N/A	N/A*	N/A*	A	N/A*	N/A	F	N/A	B	N/A	N/A	N/A
2017 PM Peak, With Improvements	N/A	A		A	A	N/A	B	N/A	B	N/A	N/A	N/A
Intersection:	Gulf Beach Highway & Dog Track Road											
2017 PM Peak, No Build	B	N/A*	N/A	N/A	N/A*	N/A*	N/A	N/A	N/A	F	N/A	F
2017 PM Peak, With Improvements	A	A	N/A	N/A	A	A	N/A	N/A	N/A	B	N/A	B
Intersection:	Gulf Beach Highway & Fairfield Drive											
2017 PM Peak, No Build	C	A	A	A	D	D	D	D	D	D	D	D
2017 PM Peak, With Improvements	C	A	A	A	D	D	D	D	D	D	D	D
Intersection:	Gulf Beach Highway & Patton Drive											
2017 PM Peak, No Build	B	N/A*	N/A	N/A	N/A*	N/A*	N/A	N/A	N/A	F	N/A	N/A*
2017 PM Peak, With Improvements	C	A	N/A	N/A	B	B	N/A	N/A	N/A	C	N/A	C
Intersection:	Gulf Beach Highway & Navy Boulevard											
2017 PM Peak, No Build	E	D	D	E	E	C	C	F	F	F	C	C
2017 PM Peak, With Improvements	D	D	D	D	D	C	B	D	D	D	B	B

N/A = Not Applicable; Lane Movement not found in intersection

N/A* = LOS is not assigned by Synchro



V. CRASH DATA ANALYSIS

Crash data from years 2007 and 2008 were obtained for SR 292 for milepost 11.8 to 18.4 from FDOT. The data received contains specific information regarding crashes including: type / harmful event as recorded by the police, time of day, location and contributing cause as well as the number of injuries and fatalities. Figures 5-1 and 5-2 illustrate crash locations along the corridor. In addition, a discussion of the areas with the highest number of crashes is provided.

Total Crashes and Injury Severity

During the analysis period there were a total of 252 total crashes. Of these, there were a total of 246 injuries and 7 fatalities.

Crash Type

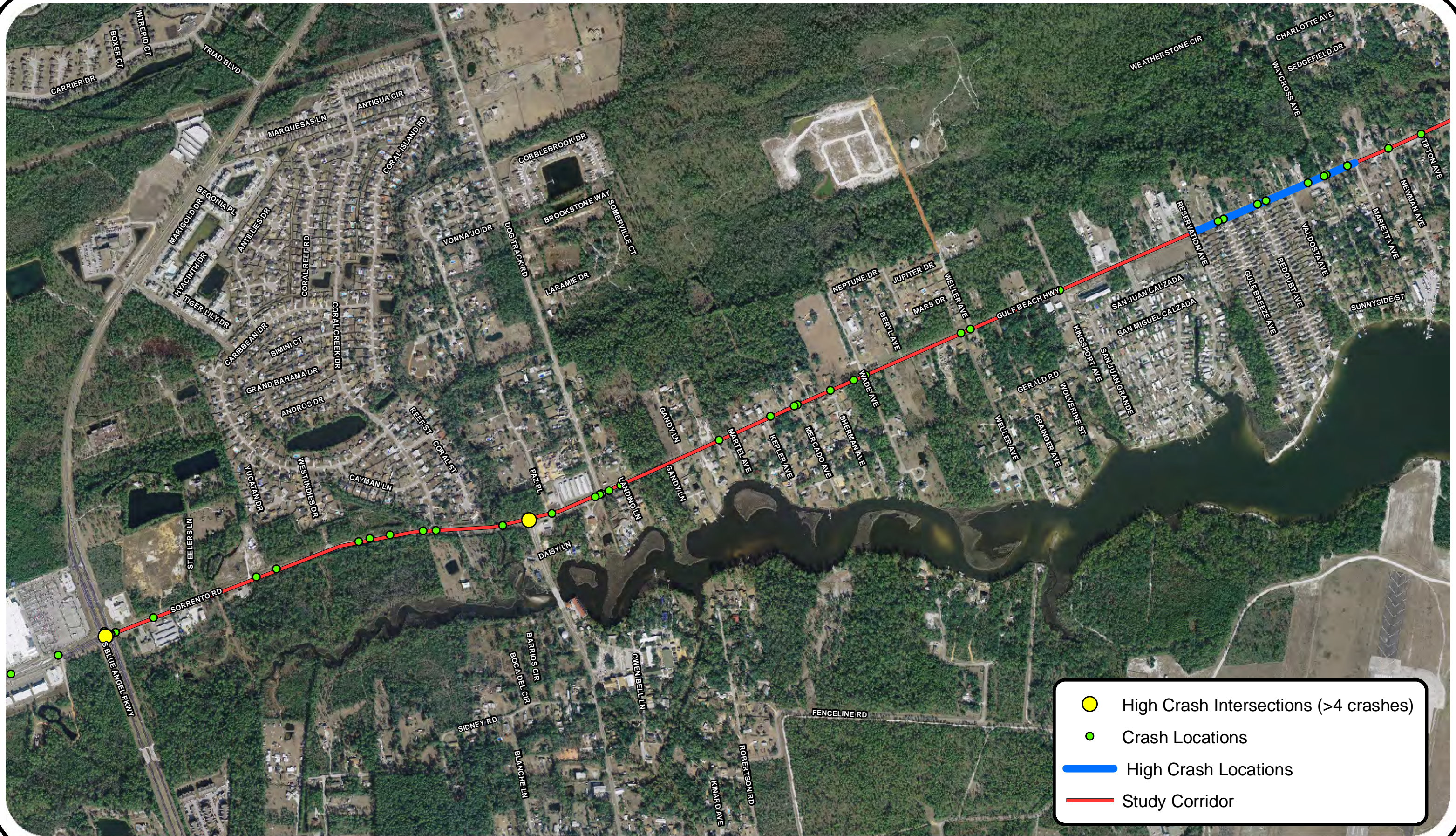
Nearly 39% percent of crashes during the analysis period were rear-end collisions, and 27% were angle collisions. All crash types are summarized in Table 5-1.

Table 5-1 Total Crashes by Type – SR 292 Corridor

CRASH TYPE	2007	2008	Total	Percentage
Unknown/Not Coded	1	4	5	2.0%
Rear-End	47	50	97	38.5%
Head-On	4	3	7	2.8%
Angle	36	32	68	27.0%
Left-Turn	4	7	11	4.4%
Backed Into	1	1	2	0.8%
Sideswipe	6	9	15	6.0%
Collision w/MV on Roadway	0	1	1	0.4%
Collision w/Pedestrian	2	4	6	2.4%
Collision w/Bicycle	0	1	1	0.4%
Hit Sign / Sign Post	1	2	3	1.2%
Utility / Light Pole	7	1	8	3.2%
Hit Guardrail	2	1	3	1.2%
Hit Fence	0	1	1	0.4%
Hit Tree/Shrubbery	1	1	2	0.8%
Hit Other Fixed Object	2	4	6	2.4%
Ran in Ditch/Culvert	3	2	5	2.0%
Overtaken	1	1	2	0.8%
Separation of Units	0	1	1	0.4%
All Other (Explain)	4	4	8	3.2%

*Only long form accidents were included. Source: FDOT

Date





Time of Day and Pavement Conditions

Nearly sixty percent of all crashes during the analysis period occurred during daylight. Almost twenty percent of crashes occurred at night with no street lights, while almost twenty percent of crashes occurred at night with street lights. Additionally, ninety percent of all crashes occurred on dry pavement conditions. These statistics are summarized in Table 5-2.

Table 5-2 Crash Distribution by Pavement Conditions and Period of Day

PAVEMENT CONDITIONS	2007	2008	Total	Percentage
Dry	110	116	226	90%
Wet	11	14	25	10%
Total	121	130	251	100%
PERIOD OF DAY				
Daylight	75	74	149	59%
Dusk	4	5	9	4%
Dawn	0	1	1	0%
Dark (Street Light)	26	21	47	19%
Dark (No Street Light)	17	29	46	18%
Total	122	130	252	100%

Contributing Cause

Forty-five percent of all crashes during the analysis period were deemed to be caused by no improper driving. These are accidents which were not caused by a traffic infraction. For example, a driver could simply lose control of their vehicle and run off the road. Nearly thirty percent of crashes were caused by careless driving. Eleven percent of crashes were caused by a failure to yield. Table 5-3 summarizes crashes by contributing cause.

Table 5-3 Causes of Crashes

CONTRIBUTING CAUSE	Percentage
Unknown/Not Coded	1%
No Improper Driving/Act	45%
Careless Driving	29%
Failed to Yield	11%
Improper Backing	0%
Improper Lane Change	2%
Improper Turn	3%
Alcohol-Under Influence	1%
Disregarded Traffic Signal	2%
Exceeded Safe Speed Limit	0%
Disregarded Stop Sign	0%
Failed to Maintain Equipment / Vehicle	0%
Drove Left of Center	0%
Fleeing Police	0%
All Other (Explain)	5%

High Crash Locations

The majority of crashes during the analysis period occurred in or near intersections. As shown below in Table 5-4, almost 70% of all crashes occurred at an intersection. Nearly 20% were classified as ‘Not at Intersection / RR Crossing / Bridge,’ while 8% were classified as Driveway Access crashes. Finally, 5% of the crashes were deemed ‘Influenced by Intersection.’

Table 5-4 Crashes Categorized by Site Location

CRASH LOCATION	Percentage
At Intersection	68%
At Bridge	0%
Driveway Access	8%
Influenced by Intersection	5%
Not at Intersection / RR Crossing / Bridge	18%
Total	100%

Intersections with the highest amount of crashes were identified and analyzed more closely. Table 5-5 summarizes intersections with three or more crashes over the two-year study period between Blue Angel Parkway and Navy Boulevard. The two intersections with the highest number of crashes are: SR 292 and Fairfield Drive and SR 292 and Navy Boulevard. The signalized intersections of SR 292 and Fairfield Drive; SR 292 and Navy Boulevard; and SR 292 and Blue Angel Parkway are discussed in more detail below. The data for these intersections was analyzed more thoroughly to uncover patterns in the type of crash incidents that occurred as well as any directional influences.

Table 5-5 Number of Crashes by Intersection

Intersection	Number of Crashes
SR 292 & Fairfield Drive	12
SR 292 & Navy Blvd	9
SR 292 & Sunset Ave / CR 292A	7
SR 292 & Rentz Ave	6
SR 292 & Blue Angel Pkwy	5
SR 292 & CR 292-A / Gulf Bch	5
SR 292 & Paulding Ave	4
SR 292 & Patton Dr	4
SR 292 & Americus Ave	3
SR 292 & Dog Track Rd	3
Gulf Bch Hwy & Harris St	3
SR 292 & Gulf Breeze Ave	3
SR 292 & Waycross Ave	3

SR 292 and Fairfield Drive

The intersection of SR 292 and Fairfield Drive had 55 total crashes within the study period. This was the largest number of crashes of any intersection location along the Corridor. Forty-three of the 55 crashes occurred on Fairfield Drive approaching SR 292, while 12 occurred on SR 292 approaching Fairfield Drive. The majority of crashes at this intersection were rear end collisions primarily due to careless driving. Of the 30 rear-end collisions on Fairfield Drive, 22, or 73%, occurred in the southbound direction.

By 2000, this intersection was signalized, and as shown below in Figure 5.3, the southbound direction of Fairfield intersecting SR 292 has a designated right-turn lane.

Types of crashes for this intersection are summarized in Table 5-6 and depicted in Figure 5.3.

Table 5-6 Crash Incidents – SR 292 and Fairfield Drive

Crash Incident	Number	Percent
Fairfield Drive approaching SR 292		
Rear end	30	70%
Head On	3	7%
Sideswipe	3	7%
Left turn	5	12%
Bicycle	1	2%
Other	1	2%
Total	43	100%
SR 292 approaching Fairfield Drive		
Rear end	6	50%
Head On	1	8%
Left turn	3	25%
Sideswipe	1	8%
Other	1	8%
Total	12	100%

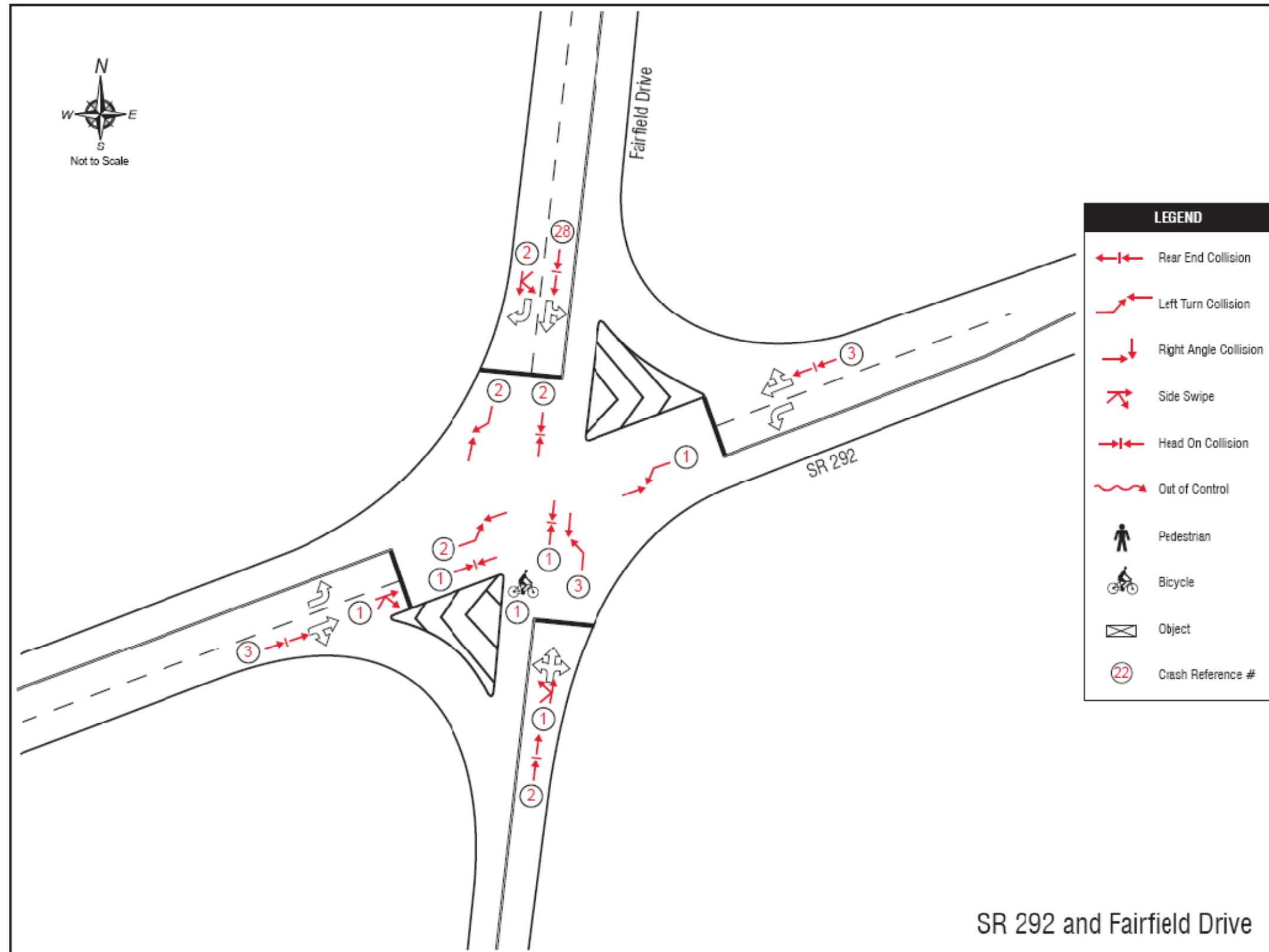


Eastern approach to Fairfield Drive intersection on SR 292.



Western approach to Fairfield Drive intersection on SR 292.

FIGURE 5.3. SR 292 AND FAIRFIELD DRIVE INTERSECTION DIAGRAM.



SR 292 and Navy Boulevard

The intersection of SR 292 and Navy Boulevard had 19 total crashes within the study period. Ten of the 19 crashes occurred on Navy Boulevard approaching SR 292, while 9 occurred on SR 292 approaching Navy Boulevard. There was a mixture of crash types in this location, with no discernable pattern emerging. Types of crashes for this intersection are summarized in Table 5-7 and depicted in Figure 5.4.

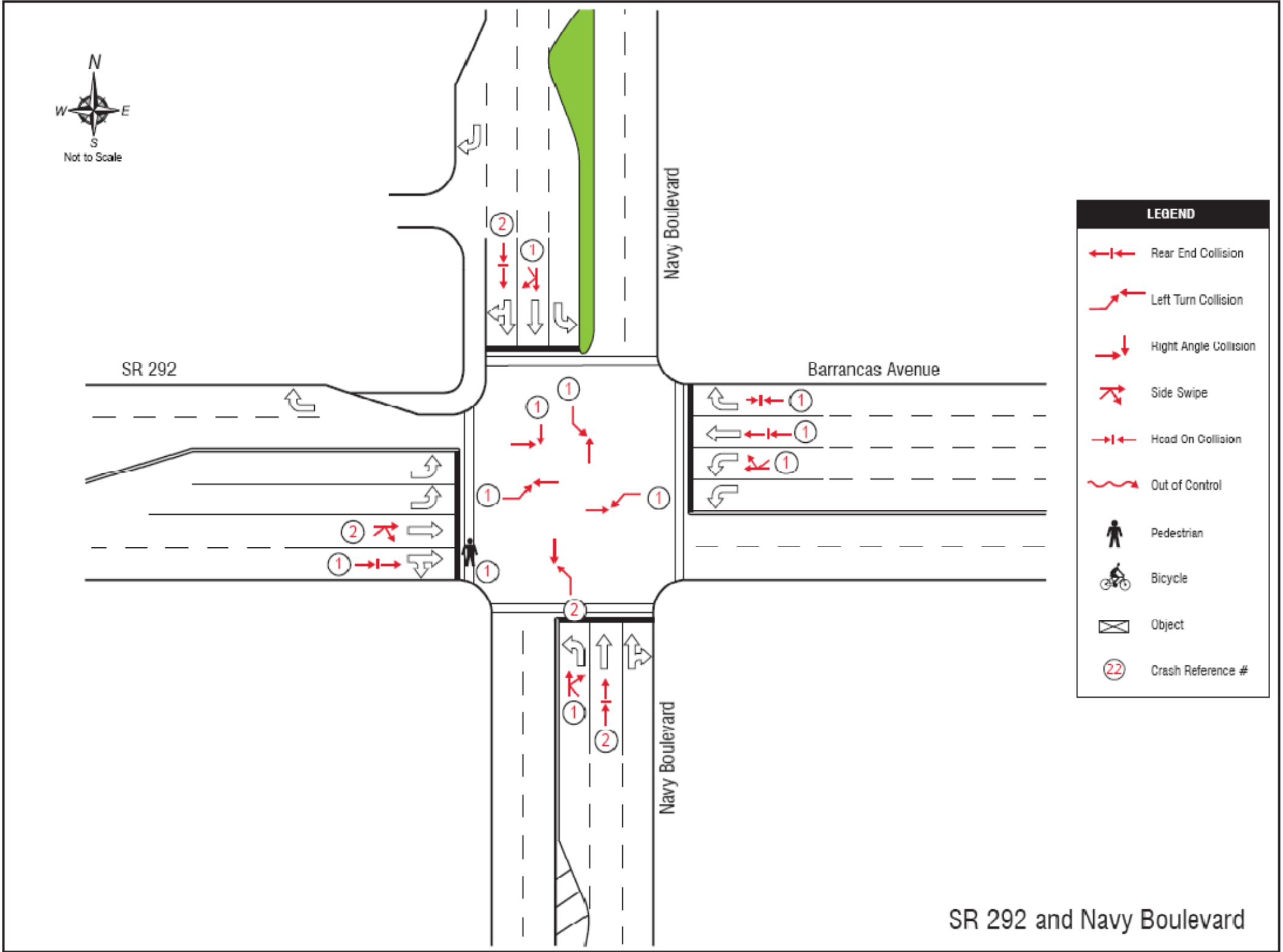
Table 5-7 Crash Incidents – Gulf Beach Highway at Navy Boulevard

Crash Incident	Number	Percent
Navy Boulevard approaching SR 292		
Rear end	4	40%
Right Angle	1	10%
Left Turn	3	30%
Sideswipe	2	20%
Total	10	100%
SR 292 approaching Navy Boulevard		
Rear end	2	22%
Sideswipe	3	33%
Left Turn	2	22%
Backed Into / Out of control	1	11%
Collision w/ Pedestrian	1	11%
Total	9	100%



SR 292 approaching Navy Boulevard intersection.

FIGURE 5.4. SR 292 AND NAVY BOULEVARD INTERSECTION DIAGRAM.



SR 292 and Blue Angel Parkway

The intersection of SR 292 and Blue Angel Parkway had 14 total crashes within the study period. Nine of the 14 crashes occurred on Blue Angel Parkway approaching SR 292, while 5 occurred on SR 292 approaching Blue Angel Parkway. There was a mixture of crash types in this location; however, 9 out of the 14 crashes were left-turn crashes. Types of crashes for this intersection are summarized in Table 5-8 and depicted in Figure 5.5.

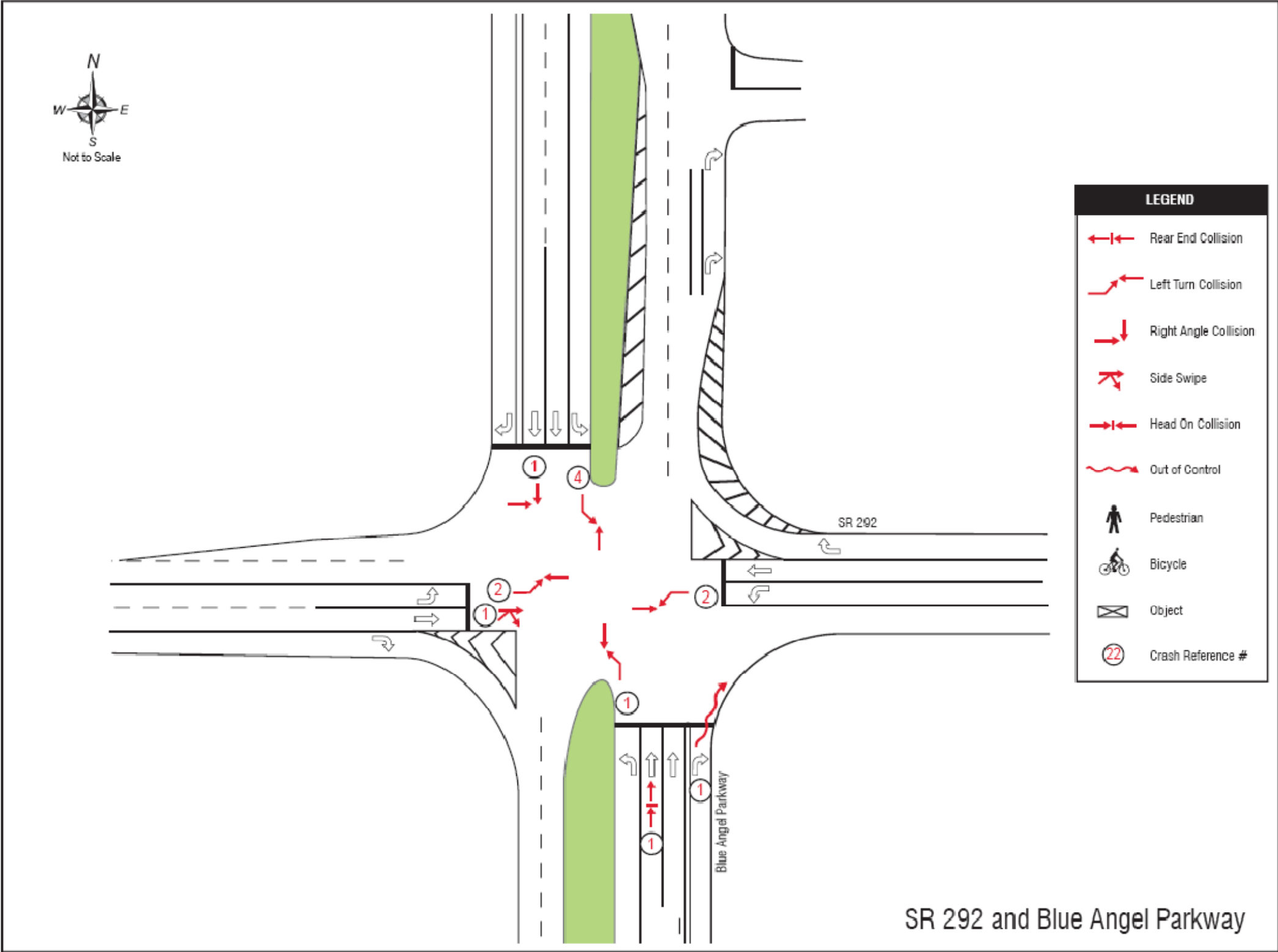
Table 5-8 Crash Incidents – SR 292 and Blue Angel Parkway

Crash Incident	Number	Percent
Blue Angel Parkway approaching SR 292		
Rear end	1	11%
Left Turn	5	56%
Out of Control	1	11%
Right Angle	1	11%
Unknown	1	11%
Total	9	100%
SR 292 approaching Blue Angel Parkway		
Left Turn	4	80%
Sideswipe	1	20%
Total	5	100%



SR 292 approaching Blue Angel Parkway intersection.

FIGURE 5.5. SR 292 AND BLUE ANGEL PARKWAY INTERSECTION DIAGRAM.



Other Crash Areas

While the majority of crashes were intersection based, the corridor was examined for concentrations of crashes outside of signalized intersections, or concentrations that were mid-block in nature. These areas are discussed below.

Between Reservation Avenue and Valdosta Avenue, which is in the two-lane portion of the Corridor where no turning lanes exist, eight crashes occurred in the two-year timeframe in a 0.22 mile area. Half of these accidents were reported as rear-end crashes.

Between Americus Avenue and Bay Meadows Drive, a distance of only 0.05 miles, six crashes occurred, five of which were rear-end collisions caused by a slowing / stopped / stalled vehicle. This area is also a two-lane roadway section with no turn lanes, and a small bridge.

From Paulding Avenue to the approach of Sunset Avenue, a distance of 0.3 miles, 14 crashes occurred in 2007 & 2008. This is a three-lane roadway section with a left turn lane in the middle lane. Five of these 14 crashes were rear-end crashes. Six of the 14 were angle crashes, and three of these were classified as caused by a failure to yield. Angle crashes are an expected crash type for this section because the intersections are not signalized. As previously mentioned, the intersection of SR 292 & CR 292-A / Sunset Avenue will be signalized & design is currently underway.

From Richmond Street to Harris Street is another 0.3 mile 3-lane section with no signalized intersections. This roadway segment had 10 crashes occurring in 2007-2008. Of these, six were rear-end crashes occurring in the eastbound direction.



SR 292 approaching Americus Avenue intersection.



SR 292 between Reservation Avenue and Valdosta Avenue.

VI. ACCESS MANAGEMENT

Overview

According to FDOT, access management is the careful planning of the location design and operation of driveways, median openings, interchanges, and street connections. The purpose of access management is to provide access to land development while simultaneously preserving the flow of traffic on the surrounding road system in terms of safety, capacity, and speed.

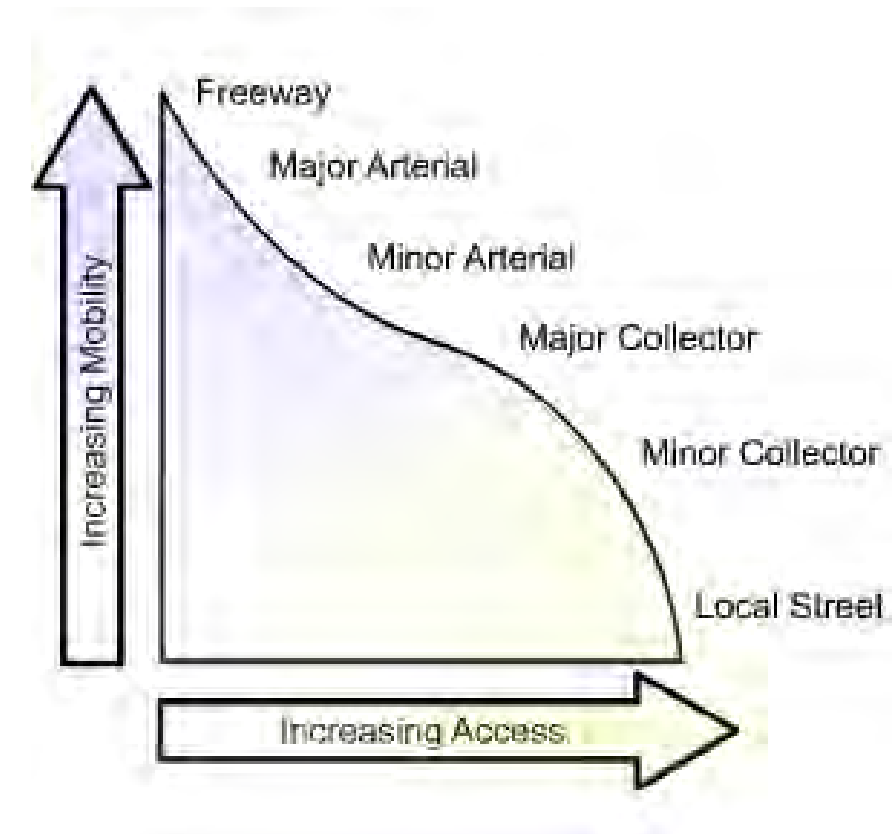
Access management functions by reducing conflict points associated with traffic turning into or leaving land developments. Conflict points are locations along a roadway where two vehicle's paths can legally cross. At a four way intersection there are as many as 36 conflict points. Crashes can potentially occur at each of these conflict points. By implementing access management techniques, the number of conflict points can be reduced, thus reducing the potential for crashes.

Without access management, the function of major roadway corridors can deteriorate rapidly.

Poor access management can result in the following impacts:

- An increase in vehicular crashes
- More collisions involving pedestrians and cyclists
- Accelerated reduction in roadway efficiency
- Unsightly commercial strip development
- Degradation of scenic landscapes
- More cut-through traffic in residential areas due to overburdened arterials
- Homes and businesses adversely impacted by a continuous cycle of widening roads
- Increased commute times, fuel consumption, and vehicular emissions as numerous driveways and traffic signals intensify congestion and delays along major roads

Implementing good access management practices can increase public safety, extend the life of major roadways, reduce traffic congestion, support alternative transportation modes, and potentially improve the appearance and quality of a corridor (Source: TRB Access Management Committee).



Benefits of Access Management

Proper access management can preserve good traffic flow and minimize accidents on roadways at a relatively low cost. A well designed access management system can:

- Reduce accidents
- Maintain efficient movement
- Preserve public investment in transportation
- Reduce the need for more new roadways
- Protect the value of private and public investments
- Enhance the environment and economic vitality of surrounding communities

Access Management Techniques

There are numerous ways to implement proper access management on a corridor. Some of these techniques include:

- Proper traffic signal spacing
- Proper unsignalized access spacing
- Corner clearances (minimum distances required between intersection and driveways)
- Median alternatives
- Left-turn lane treatments
- U-turn alternatives
- Driveway consolidation

Implementation of these various techniques can help limit the number of conflict points at driveway locations, separate conflict areas, reduce the interference of turning traffic with through traffic and provide adequate circulation and storage for traffic on properties (Sources: FDOT and NCHRP 420).

SR 292 Corridor Access Overview

The roadway characteristics of the SR 292 Corridor are aligned with Access Class 6. Access Class 6 is outlined in Florida Administrative Code (FAC) Rule Chapter 14-97 as, “...used where existing land use and roadway sections have been built out to a greater extent than those roadway segments classified as Access Classes 3 and 4 and where the probability of major land use change is not as high as those roadway segments classified Access Classes 3 and 4. These highways will be distinguished by existing or planned non-restrictive medians or centers.”

For a Class 6 roadway, FAC 14-97 specifies that connection spacing should be 245 feet for roadway segments where the speed limit is 45 miles per hour or below, and 440 feet for segments with a speed limit greater than 45 miles per hour, as shown below in Table 6-1.

FIGURE 6-1 SPACING STANDARDS IN FAC RULE CHAPTER 14-97.003.

Class	Median Type	Connection Spacing (feet)		Median Opening Spacing (feet)		Signal Spacing (feet)
		≤45mph Posted	>45mph Posted	Directional	Full	
Generally Developing or Undeveloped						
2	Restrictive w/Service Roads	660	1320	1320	2640	2640
3	Restrictive	440	660	1320	2640	2640
4	Non-Restrictive	440	660			2640
Generally Developed						
5	Restrictive	245	440	660	2640/1320*	2640/1320*
6	Non-Restrictive	245	440			1320
7	Both Median Types	125		330	660	1320

The SR 292 Corridor between Blue Angel Parkway and Navy Boulevard has approximately 230 total access points, of which approximately 115 are paved. This equates to an average of 44 access points per mile, or one access point every 120 feet, which is well below the recommended 245 feet of spacing between access points.

Furthermore, at certain points along the roadway corridor, the access spacing is less than the 120 foot average which increases opportunities for conflict.

Several access management problems were found to be prevalent along the SR 292 roadway segment, including:

- Large driveway width- lack of clearly defined driveways causes unclear enter / exit points.
- Multiple access points per destination- certain areas in the corridor offer multiple driveways for destinations.
- Loosely defined access points- the corridor contains dirt access points that have been informally created by use.



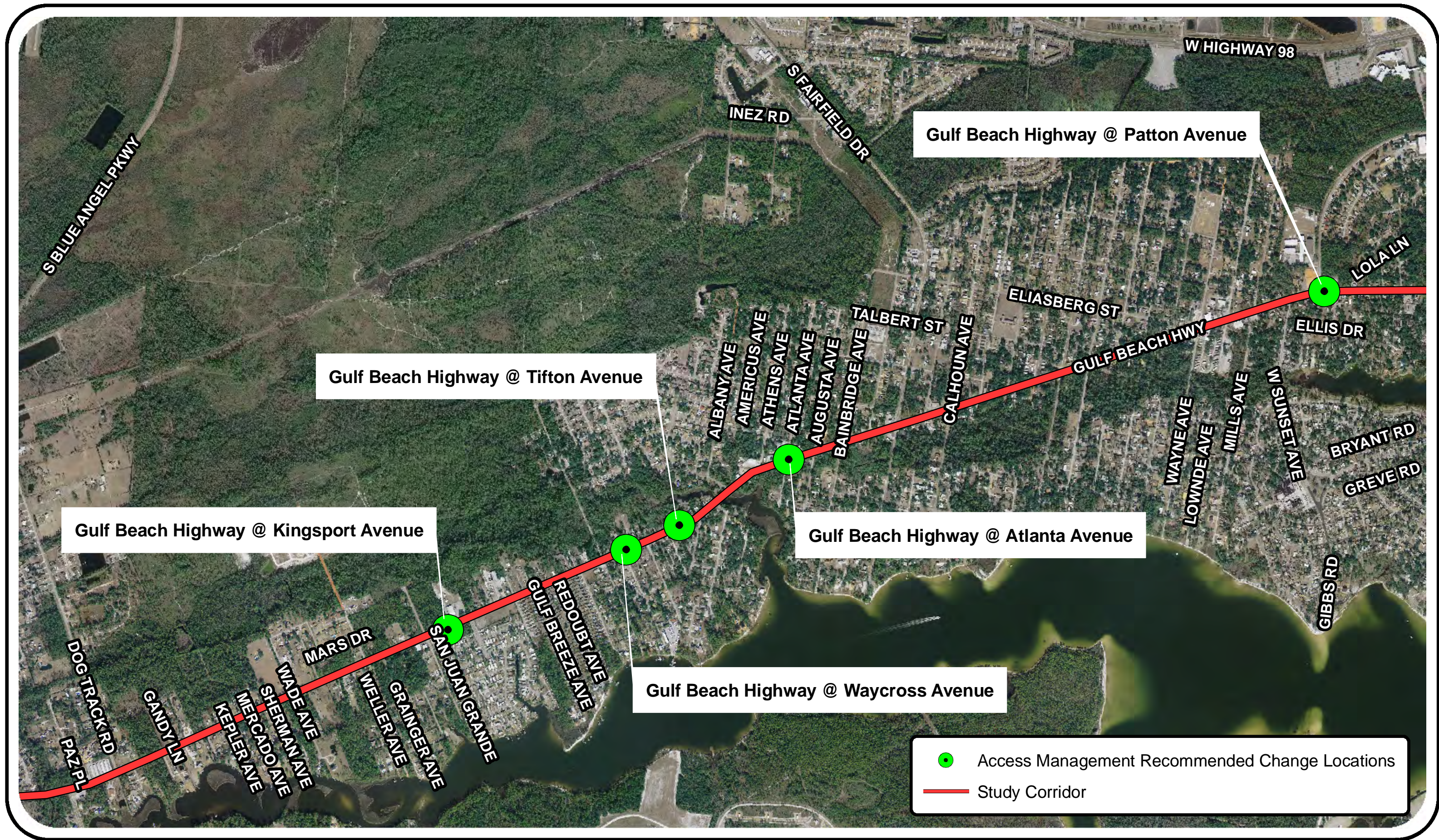
Access Management Implementation on the SR 292 Corridor

To remedy the access management issues outlined above, available options include:

- Reduction of wide driveway width, where appropriate;
- Driveway consolidation / elimination of multiple access points for one location;
- Co-location of access for multiple properties; and
- Monitoring and as needed modification of access points during the building permit process as residential properties convert into businesses.

In addition to driveway access, median design and signal placement will directly impact access management efforts on the SR 292 corridor. A raised median can restrict access by channeling left turn movements & forcing U-turns. U-turns have been found to reduce the total crash reduction rate by 18% and the injury fatality crash rate by 27% (Source: John Lu, Ph.D., USF 2001). Median striping, designation of right and left turn-only lanes, and roadway signage all play an important role in defining access and traffic flow along the corridor.

Figure 6-1 identifies locations along the corridor with identified access management issues. Figure 6-2 through 6-6 show illustrations of recommended changes at these specific areas. A description of the recommended changes for each identified area is also included. It should be noted that the engineering design process may yield additional recommended access management changes.



SR 292 and Kingsport Avenue Intersection

A wide driveway exists to the west of this intersection along SR 292. Another wide access point for this business is located along Kingsport Avenue. The width of these access points creates increased opportunities for conflict. Additionally, this business could be adequately served by one access point instead of two.

Recommendation

Reduce driveway width at one or both access points, or close the SR 292 access point, which will require access via Kingsport Avenue.



FIGURE 6.2- SR 292 AND KINGSFORT AVENUE INTERSECTION

SR 292 and Atlanta Avenue Intersection

Along SR 292, wide driveways flank each side of Atlanta Avenue. The width of these access points creates increased opportunities for conflict, both within the driveways and with Atlanta Avenue traffic & bicyclists or pedestrians. Additionally, these businesses are both served by two access points.

Recommendation

Reduce the driveway width of the two driveways along SR 292 that are closest to the Atlanta Avenue intersection. Consider driveway closure of for the eastern access point, which will force access via Atlanta Avenue.



FIGURE 6.3- SR 292 AND ATLANTA AVENUE INTERSECTION

SR 292 and Tifton Avenue Intersection

A wide driveway currently exists directly to the west of Tifton Avenue. The width of this access point as well as its proximity to Tifton Avenue increases the opportunity for conflict.

Recommendation

Narrow driveway width by eliminating a portion of the driveway that is closest to Tifton Avenue.



FIGURE 6.4- SR 292 AND TIFTON AVENUE INTERSECTION

SR 292 and Patton Drive Intersection

A wide driveway currently exists directly to the east of Patton Drive. The width of this access point as well as its proximity to Patton Drive increases the opportunity for conflict.

Recommendation

Narrow driveway width by eliminating a portion of the driveway that is closest to Patton Drive.



FIGURE 6.5- SR 292 AND PATTON DRIVE INTERSECTION

SR 292 and Waycross Avenue Intersection

A wide driveway currently exists directly to the west of Waycross Avenue. The width of this access point as well as its proximity to Waycross Avenue increases the opportunity for conflict.

Recommendation

Narrow driveway width by eliminating a portion of the driveway that is closest to Waycross Avenue.



FIGURE 6.6- SR 292 AND WAYCROSS AVENUE INTERSECTION

VII. PUBLIC INVOLVEMENT

One of the key components of a corridor management plan is to engage citizens and stakeholders and to solicit public input and comment. This was accomplished by holding a series of public workshops at a central location on the corridor. Public workshops were held in the months of February, April and May 2010 at Navy Point Elementary School on Patton Drive. Notices of these workshops were mailed to all property owners living within 300 feet of SR 292 (See Figure 7-1). Addresses were obtained from the Escambia County Property Appraiser. Ads were also run in the Pensacola News-Journal.

The public workshops were an open house format and conducted as an informational workshop. While no formal presentations were given, large aerial images with the proposed corridor improvements shown on display for attendees to observe and comment on. Members of PBS&J as well as the Florida-Alabama TPO were on hand to answer questions and explain the corridor management planning process. Informational sheets were also available to those who attended (See Figure 7-2).

The response to the proposed, three-lane typical section was a positive one. Overall, residents are aware of the current traffic and safety issues relating to SR 292 and see the need for it to be upgraded from two lanes. Many attendees were also in favor of adding more traffic lights to SR 292, citing difficulties pulling out onto SR 292 from side roads. The desire for sidewalks was also expressed by many of those in attendance.

In addition to the verbal comments solicited at the public workshops, attendees were encouraged to fill out a comment sheet before they left (See Figure 7-3).

FIGURE 7-1 PUBLIC WORKSHOP MAILOUT FLYER



The second of three public workshops regarding the traffic flow on Gulf Beach Highway from Navy Boulevard to Blue Angel Parkway will be held on Tuesday, April 13, 2010. Please feel free to come anytime between 5:00 and 7:00 p.m. The workshop location is 1321 Patton Drive.

The Florida-Alabama Transportation Planning Organization (TPO) is conducting a Corridor Management Study on Gulf Beach Highway from Navy Boulevard to Blue Angel Parkway. The purpose of this study is to identify low cost strategies and ways to improve traffic flow and safety for all modes of travel along the corridor.

The purpose of this workshop is to show the concepts that have been developed based on comments from the first public workshop. You are encouraged to attend and bring a friend.

For more information call Lane Gortemoller at 850-478-9844.

Open House Workshop

Stop by anytime 5:00 – 7:00 p.m.

April 13, 2010


Navy Point Elementary School
1321 Patton Drive, Pensacola, FL 32507



Public participation is solicited without regard to race, color, national origin, age, sex, religion, disability or family status. Persons who require special accommodations under the Americans with Disabilities Act or persons who require translation services (free of charge) should contact Lane Gortemoller at 850-478-9844 at least 3 days before the event.

FIGURE 7-2 PUBLIC INFORMATION SHEET (FRONT)

Gulf Beach Highway / Sorrento Road (SR 292)
Corridor Management Plan (CMP) Information Sheet



- **Purpose:** Identify problem areas along the Corridor and recommend potential improvements that will increase safety while enhancing mobility and accessibility.
- **Corridor Study Limits:** From Blue Angel Parkway to Navy Boulevard.
- The CMP will analyze both existing and future conditions of the Corridor. This will include analyzing current roadway conditions and capacity, collecting new data, and assessing projected future roadway conditions for the year 2017.
- High-crash locations, intersection functioning, and access issues will be examined as well.
- The CMP analysis combined with input from the public will shape recommendations for improvements to the Corridor.
- For more information, please contact:
 Wiley C. Page, Jr., AICP
WCPage@pbsj.com

Please turn over for more Gulf Beach Highway CMP Facts.

Florida-Alabama
TPO Transportation Planning Organization

PBSJ

FIGURE 7-2 PUBLIC INFORMATION SHEET (BACK)

QUICK FACTS about Gulf Beach Highway (GBH) and the CMP

- In the adopted 2030 Florida-Alabama TPO Long Range Transportation Plan, the 4-laning of GBH from the Alabama state line to Navy Boulevard is identified as a needed improvement; however, only the 4-laning of GBH from the state line to Blue Angel Parkway is currently cost-feasible.
- **Current Traffic:** GBH from Blue Angel Parkway to Fairfield Drive is operating at an acceptable level of service. However, from Fairfield Drive to Navy Boulevard, the roadway is failing to meet its adopted level of service standard. Current traffic along the corridor is between 10,000 and 19,500 daily trips.
- In the PM Peak Hour, the intersections of GBH & Dog Track Road and GBH & Patton Drive are failing to meet their adopted level of service standard.
- **Future Traffic:** GBH from Blue Angel Parkway to GBH/ CR 297 is projected to operate at an acceptable level of service through 2017. From GBH/ CR 297 to Navy Boulevard, one or both directions of the roadway are projected to fail to meet its adopted level of service standard. 2017 traffic along GBH is projected to range between 11,800 and 22,800 daily trips.
- One of the projects the CMP will explore is the realignment of the Patton Drive & West Sunset Avenue intersections.
- **Crashes along the Corridor:** Two-thirds of crashes in 2007 & 2008 were either rear-end (39%) or angle (27%) crashes. Seventy percent of all crashes occurred at intersections. The CMP will further examine crash patterns at the GBH & Navy Boulevard, GBH & Fairfield Drive, and GBH & Blue Angel Parkway intersections.
- The CMP will also address **Access Management** along the Corridor, which is the planning for the design & operation of driveways, median openings, interchanges, & street connections.

PLEASE COMPLETE THE COMMENT SHEET AND DROP OFF AT THE MEETING BEFORE YOU LEAVE,
OR
FOLD, TAPE (DO NOT STAPLE), ADD FIRST CLASS POSTAGE AND MAIL NO LATER THAN MARCH 16, 2010

VIII. RECOMMENDED ROADWAY MODIFICATIONS

The following are recommended roadway and corridor modifications. These modifications are summarized in Table 8-1. These improvements are also shown on the Figure 7-4, Plan Sheets 1-10.

Table 8-1 Recommended Corridor Improvements

Near-Term Improvements	
Signalization Projects	Intersection
	SR 292 at Dog Track Road
	SR 292 at Patton Drive
	SR 292 at Old Gulf Beach Highway
Realignment of Patton Drive at SR 292	
Construction of sidewalks from Patton Drive to Blue Angel Parkway	
Signal retiming – SR 292 at Navy Boulevard	
Safety Improvements – Fairfield Drive at SR 292 (Dedicated left turn lane)	
Trimming of trees and foliage to improve sight lines at the intersections of SR 292 and Atlanta Avenue, Augusta Avenue and Bainbridge Avenue	
Construction of turn lanes at SR 292 and Wade Avenue	
Long-Term Improvements	
Intersection Modifications at SR 292 and Navy Boulevard	
Widening of SR 292 to 3 lanes from the end of the current 3 lane section to San Marcos Camino Road	

Signalization Projects

As shown in Existing Conditions analysis, the intersection of SR 292 and Dog Track Road and the intersection of SR 292 and Patton Drive currently operate at a LOS E. These intersections are projected to have a failing LOS unless they are improved. It is recommended that both of these intersections be signalized, if and when the traffic volumes and delay meet the MUTCD Signal Warrant. The future conditions analysis shows that with installation of a signal, both of these intersections will operate at an acceptable LOS in 2017.

Additionally, the northbound lane movements at SR 292 and Gulf Beach Highway (CR 292) are expected to fail by 2017. However, the lane movements will function at an acceptable LOS if the intersection is signalized. Therefore, it is recommended that this intersection be signalized when the traffic volumes and delay meet the MUTCD Signal Warrant.

Given their close proximity, if both SR 292 at Dog Track Road and SR 292 at Gulf Beach Highway (CR 292) are signalized, the signal timings will need to be coordinated.

Realignment of Patton Drive at SR 292

The intersection of Patton Drive at SR 292 currently does not align with Winthrop Avenue. Because of this, there are significant safety concerns and site distance issues with vehicles turning onto SR 292 from Winthrop Avenue and Patton Drive. It is recommended that Patton Drive be realigned so that it aligns with either Winthrop Avenue or Ellinor Court. The addition of a signal at this realignment is also still recommended.

Multimodal Improvements

Currently, sidewalks are located on SR 292 from Patton Drive east to Navy Boulevard. West of Patton only a paved shoulder exists. It is recommended that sidewalks be extended from Patton Drive west to Blue Angel Parkway. There is a large presence of pedestrians and bicyclists along SR 292 and a continuous sidewalk along the entire corridor would greatly increase pedestrian safety as well as multimodal mobility.

Signal Retiming – SR 292 at Navy Boulevard

Three alternatives were analyzed to improve LOS at the intersection of SR 292 and Navy Boulevard. These alternatives included: signal retiming, improvements to the eastbound approach to the intersection and improvements to the westbound approach to the intersection. All three alternatives resulted in improved traffic operations at the intersection. The most basic approach would be to retime the traffic signal. This would not require any construction. However, further study may be required to determine the impacts of this signal revision on the operations of

adjacent traffic signals. If these signals are part of a coordinated system the timing may have to be adjusted on those as well. The remaining options each require construction and possible right of way acquisition. These costs can be significant and provide only marginal improvement over simply retiming the existing traffic signal.

Safety Improvements

Fairfield Drive approaching SR 292

Fairfield Drive at SR 292 had the largest number of crashes of any intersection location along the study corridor, with 55 total crashes in 2007-2008. Given that 22 rear-end collisions occurred on Fairfield Drive in the southbound direction approaching SR 292, it is important to consider safety improvements at this location. The configuration of the SR 292 intersection is such that for drivers heading southbound on Fairfield approaching the intersection, a right-turning movement is provided by a right turn-only lane, but a through movement or left-turn movement shares a center lane. A separate left turn-only lane and through lane are recommended.

SR 292 and Blue Angel Parkway

Nine out of the 14 crashes at Blue Angel Parkway and SR 292 were left-turn crashes in 2007-08. However, this intersection has been improved with the addition of Target at this intersection. Therefore, this intersection needs to be analyzed again in the future to ensure that the new improvements are decreasing the rate of crash incidence, particularly left-turn crashes.

Trimming of trees and foliage to improve sight lines

The intersections of SR 292 at Atlanta Avenue, Augusta Avenue and Bainbridge Avenue all have substantial overgrown trees and foliage encroaching on the roadway. This impedes views for drivers attempting to turn onto SR 292. It is recommended that this be trimmed back from the roadway and maintained this way.

Access Management Improvements

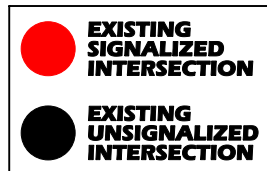
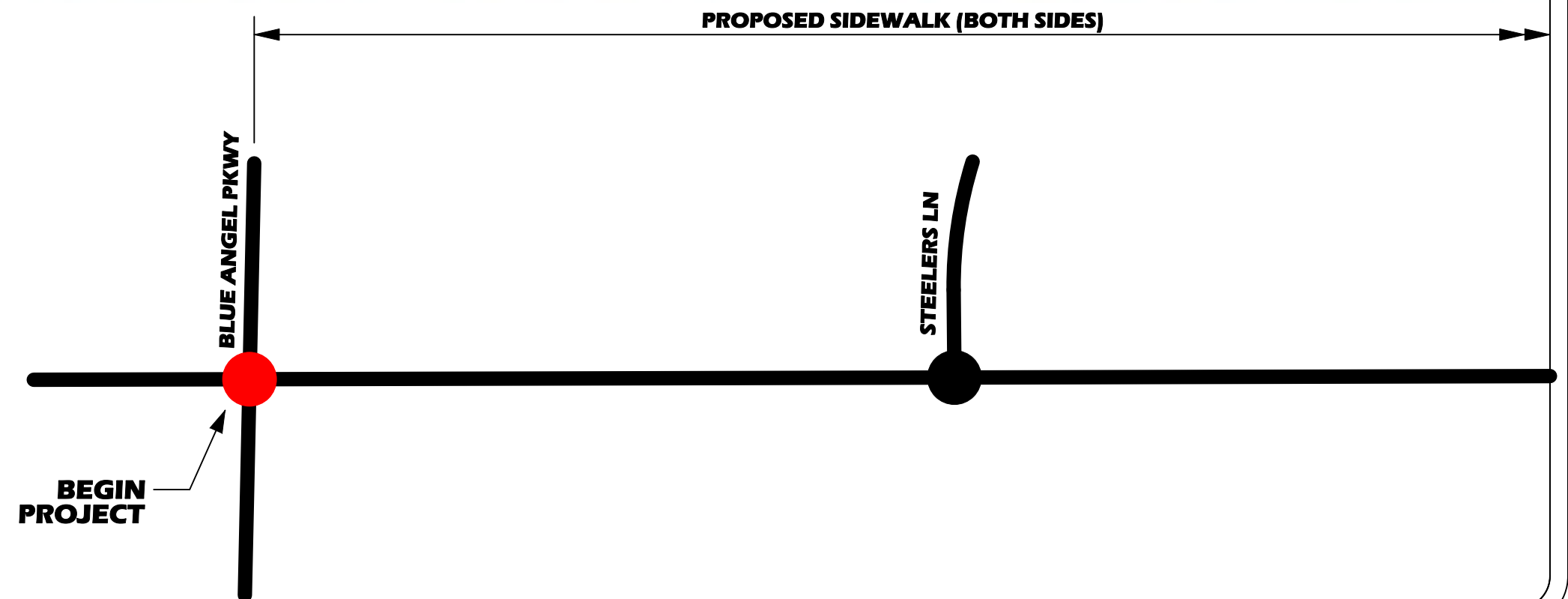
As detailed in Section VI., five locations have been identified for possible driveway narrowing or closures as part of new site plan reviews in order to reduce conflicts between cars or cars & bicyclists / pedestrians. These SR 292 intersections include: SR 292 and Kingsport Avenue; SR 292 and Atlanta Avenue; SR 292 and Tifton Avenue; SR 292 and Patton Drive; and SR 292 and Waycross Avenue.

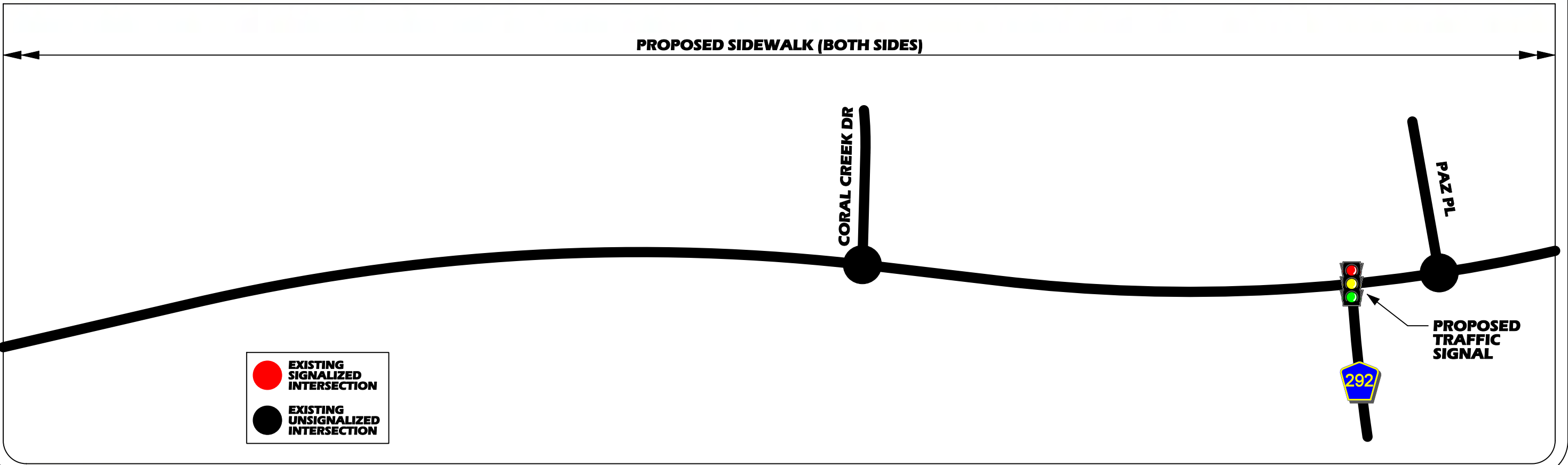
Long Range Capacity Improvements

As shown in the Existing Conditions Analysis & in the 2017 Future Conditions Analysis, SR 292 from Fairfield Drive to Navy Boulevard is currently operating at a deficient LOS, and the LOS is projected to continue to deteriorate through 2017. In the current update of the 2035 Long Range Plan, a project has been included in the needs assessment that calls for this facility to be widened to four lanes.

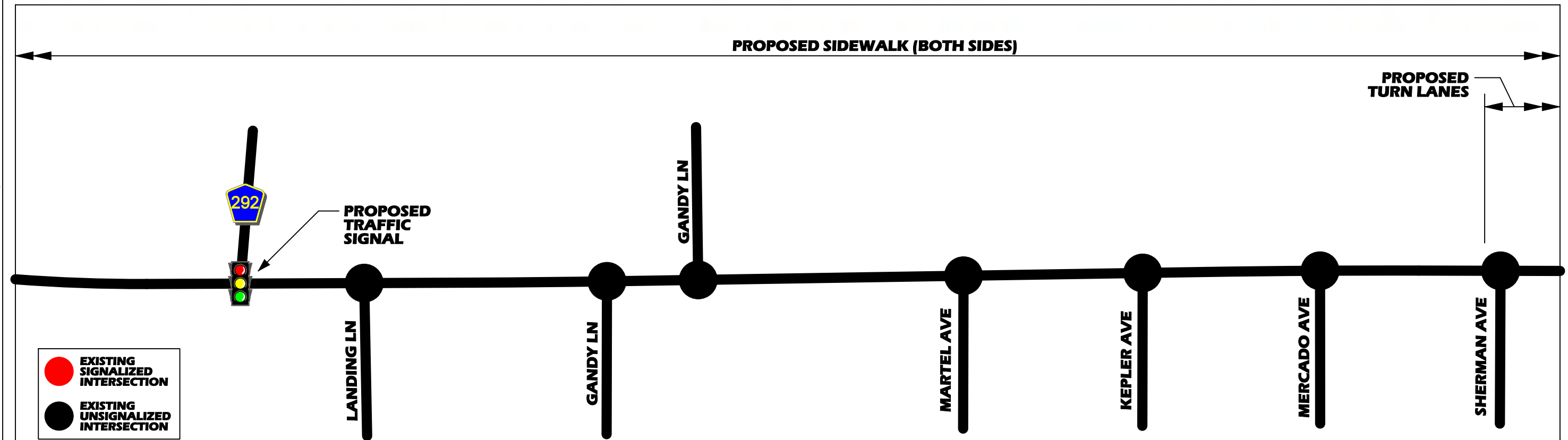
Additionally, the intersection of SR 292 and Navy Boulevard is operating deficiently. As mentioned previously, a signal retiming would be the most basic approach and not require any major intersection modifications. However, a more permanent fix would be to make improvements to either the eastbound or westbound approach to the intersection. Doing so may require ROW acquisition as well as construction which could make the project cost prohibitive.

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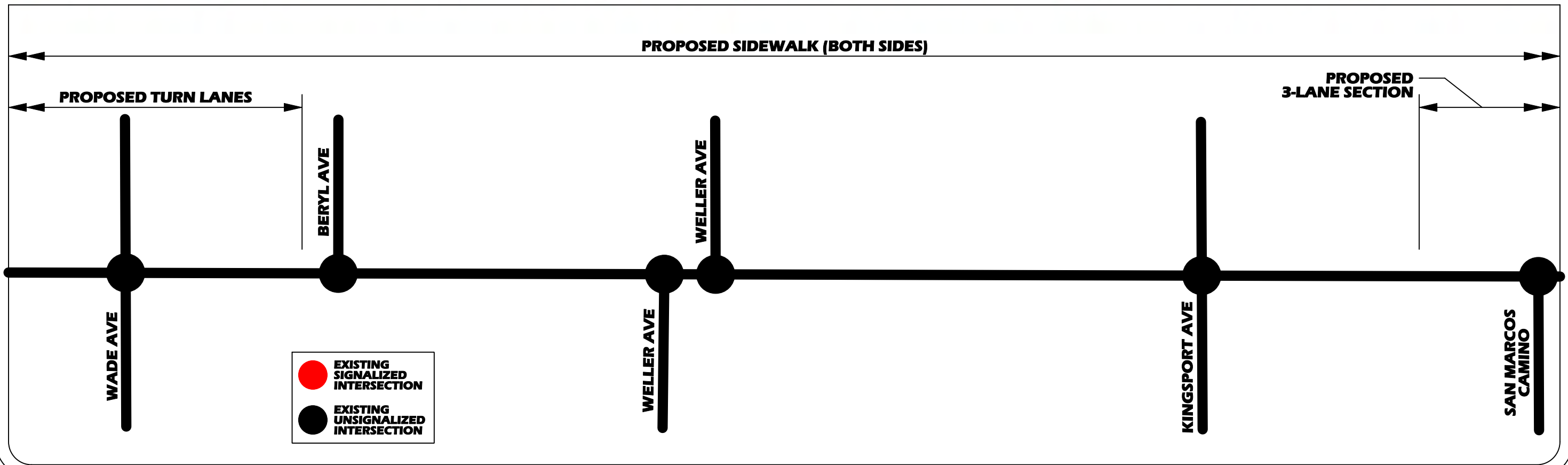
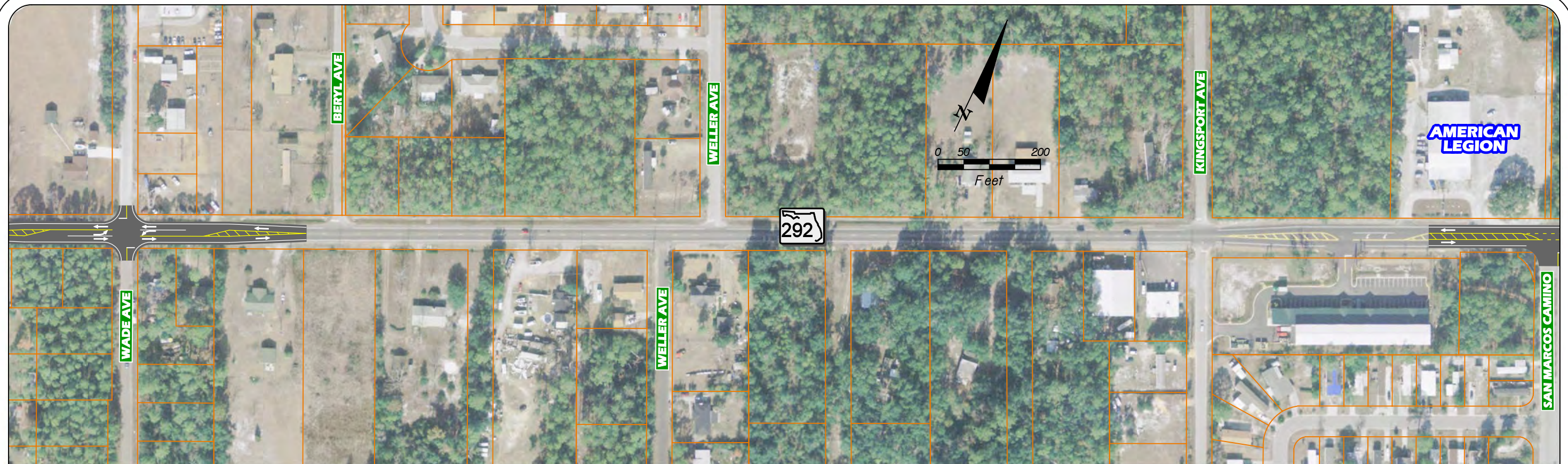




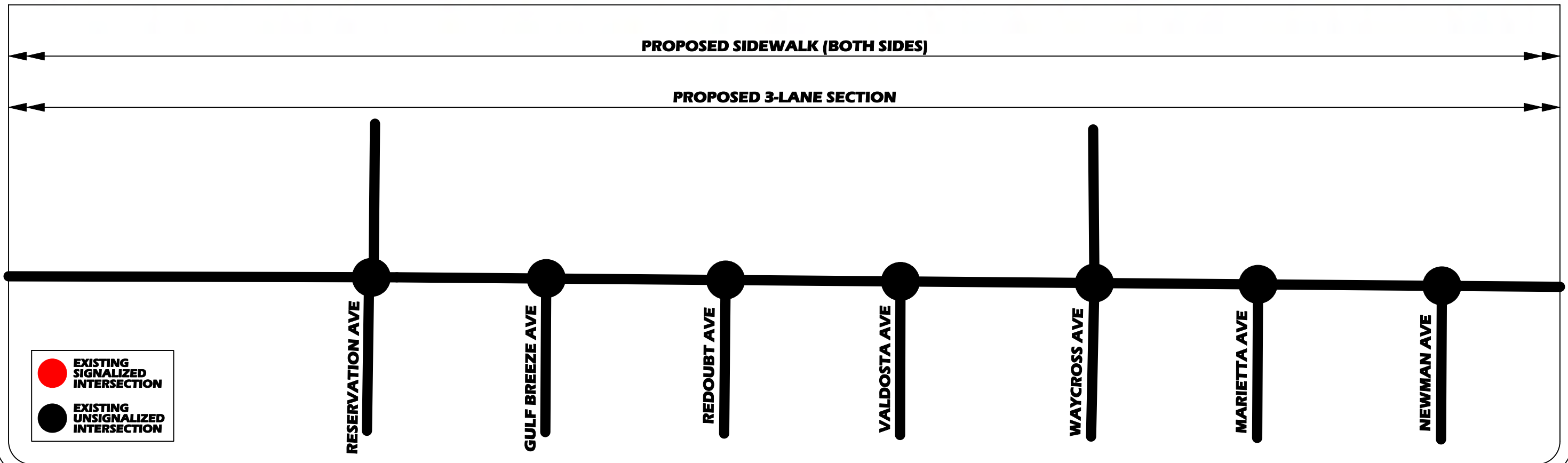
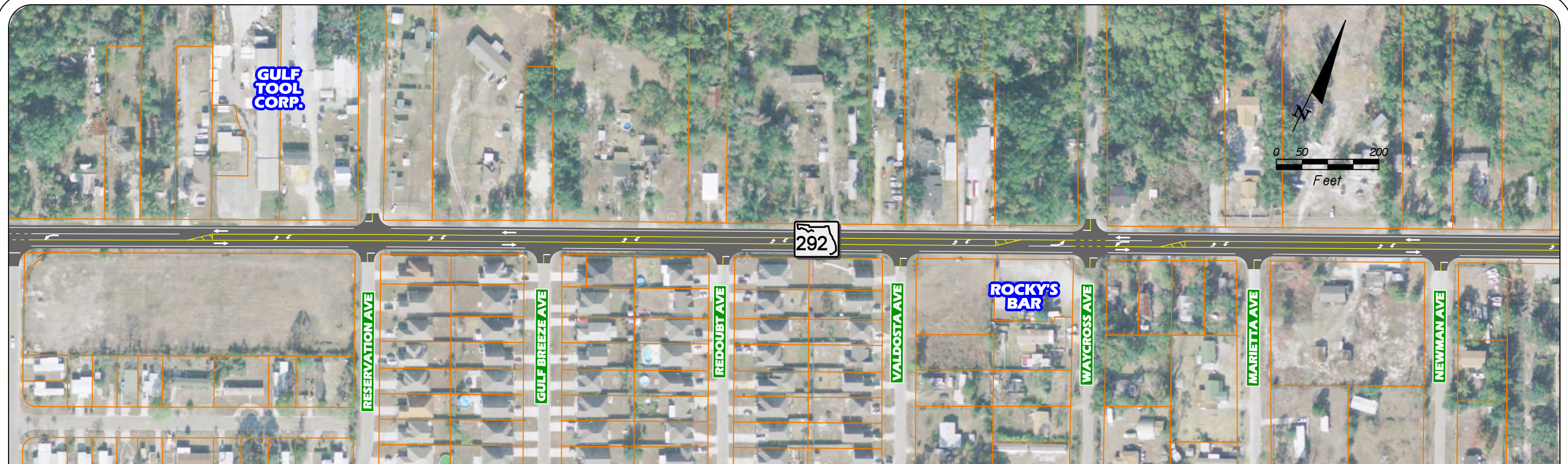
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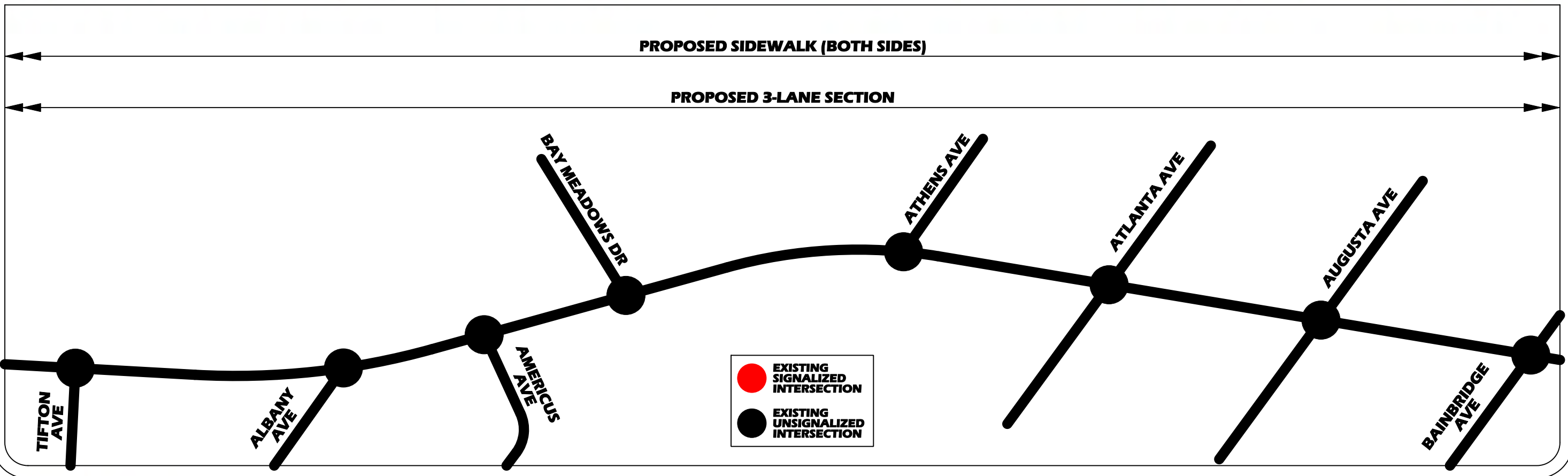


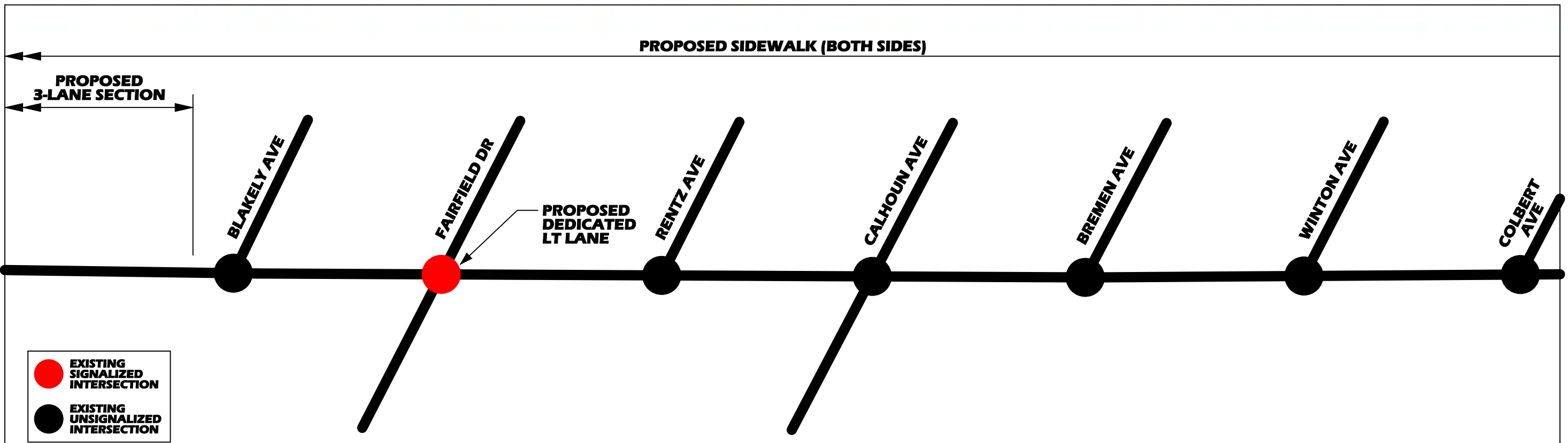
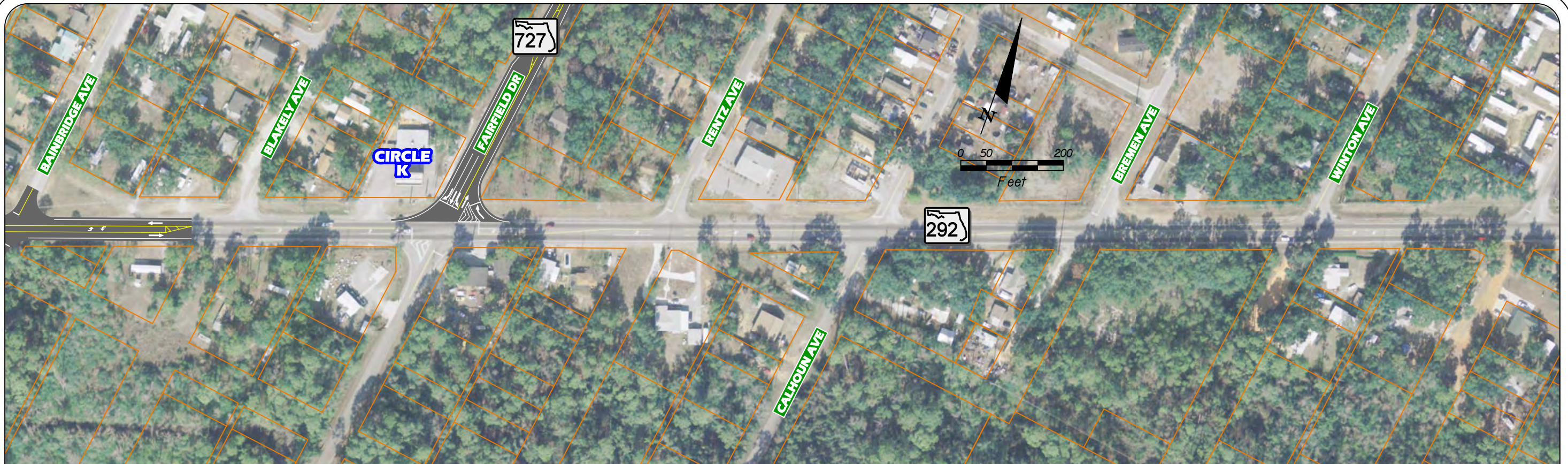
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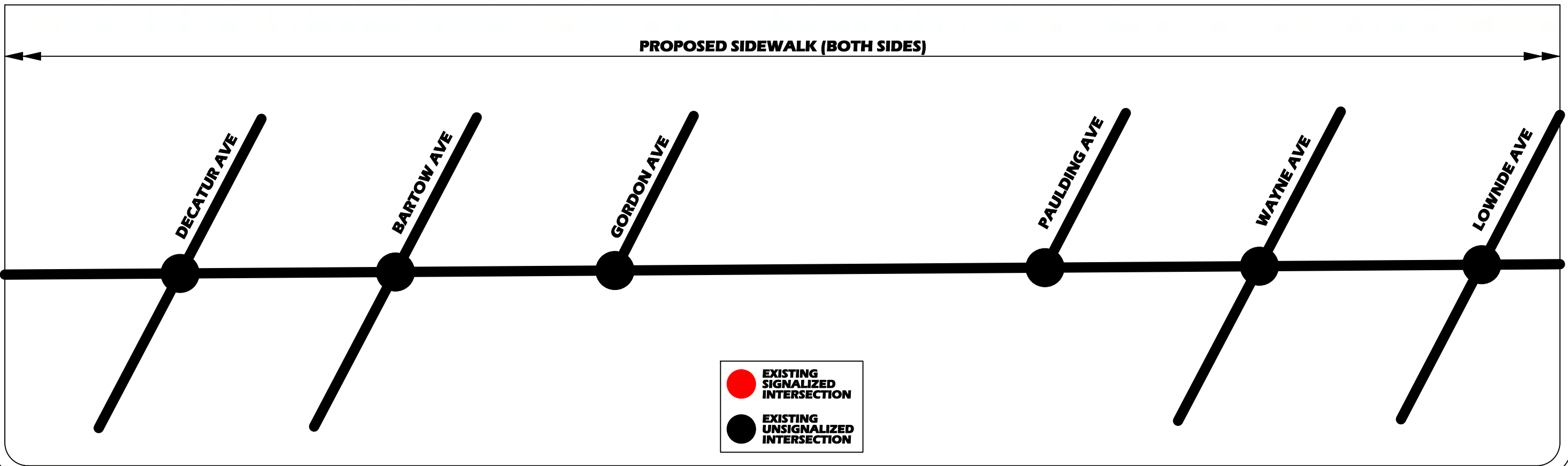
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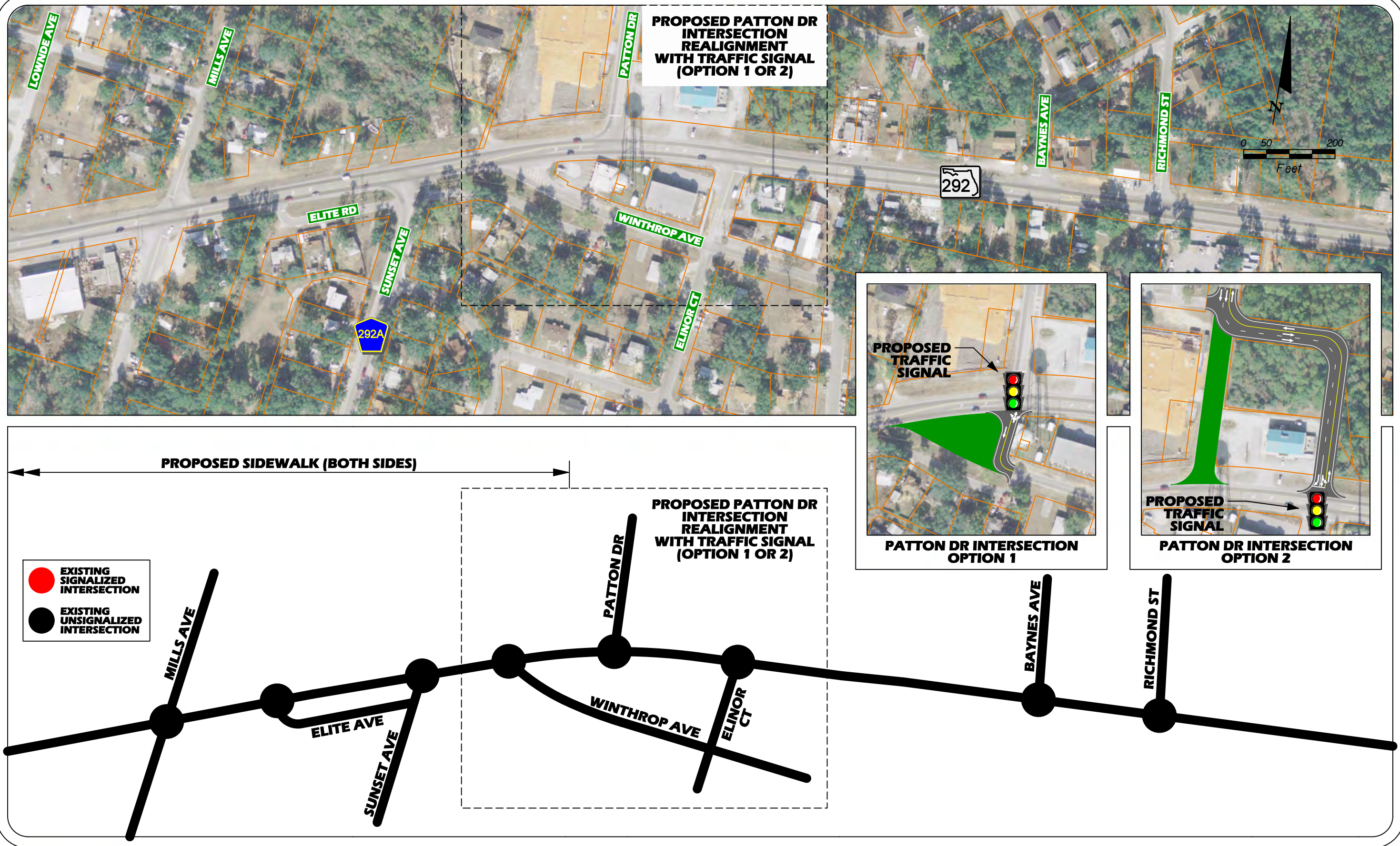


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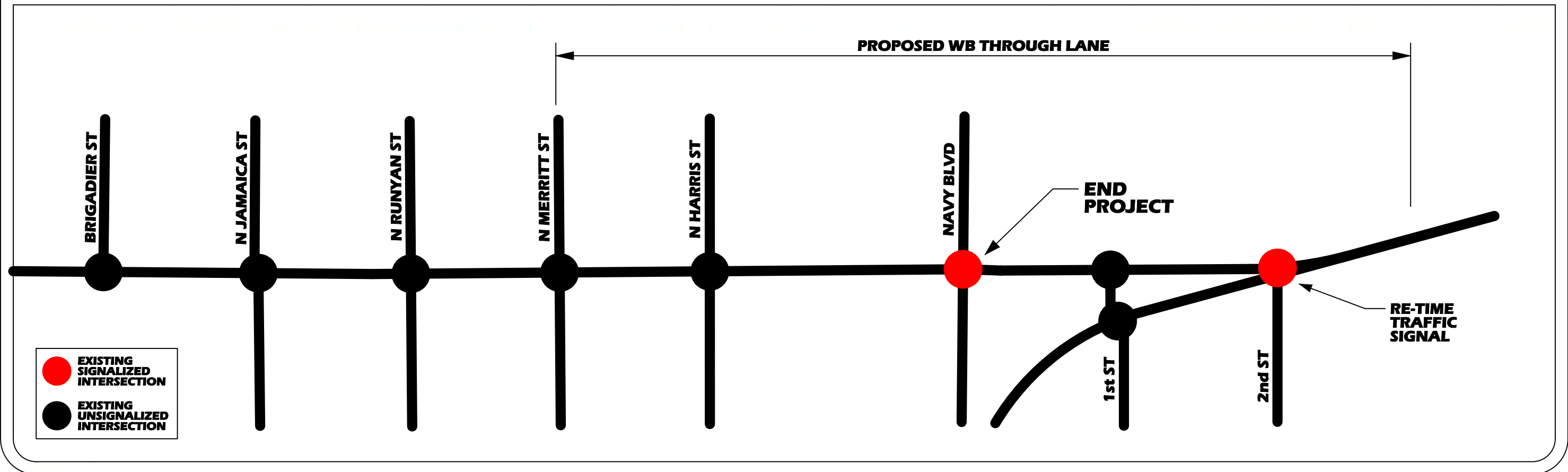
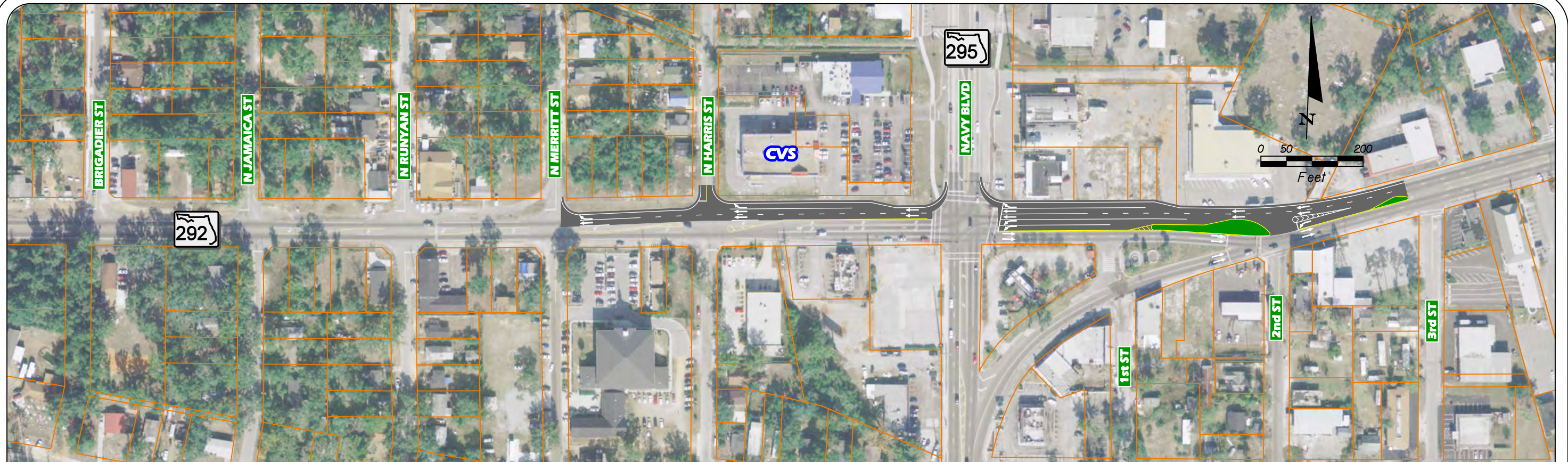


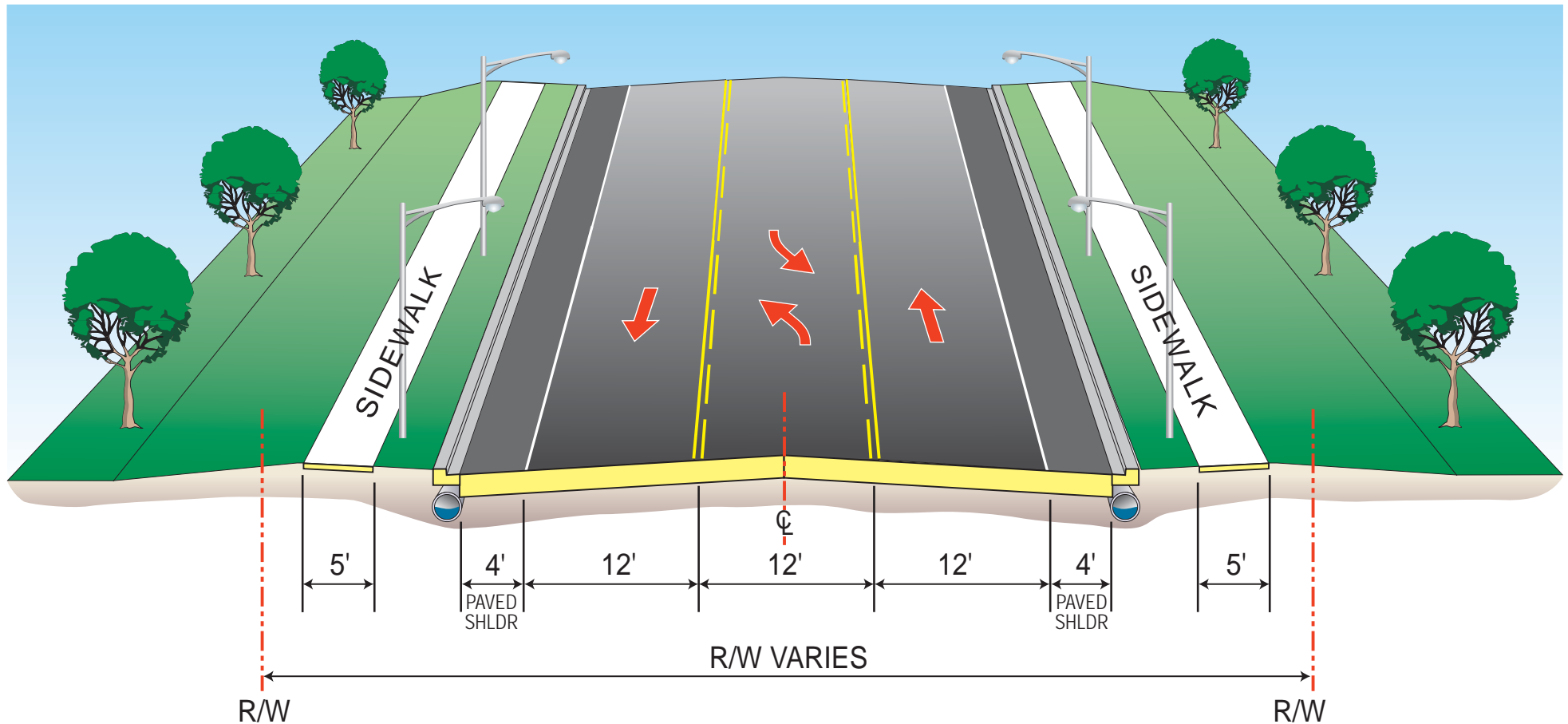
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IX. PRELIMINARY COST ESTIMATES – RECOMMENDED CORRIDOR IMPROVEMENTS

Table 9-1 summarizes the preliminary cost estimates for the recommended corridor improvements. It should be noted that these estimates are general costs based on the most current (October 2009) FDOT District 3 construction costs. These estimates do not include CEI or potential ROW acquisition or necessary drainage improvements.

Table 9-1 Preliminary Cost Estimates

Project	Cost Estimate
SR 292 at Dog Track Road - Signalization	\$190,984.00
SR 292 at Sorrento Road - Signalization	\$190,984.00
SR 292 at Patton Drive - Signalization (without realignment)	\$190,984.00
Intersection realignment - Patton Drive at SR 292	Option 1 \$265,208.00*
	Option 2 \$530,417.00*
Sidewalk construction - Navy Boulevard to Patton Drive (both sides of road @ 4.6 miles)	\$1,310,333.00
Signal Retiming - Navy Boulevard at SR 292	N/A
Safety Improvements - Fairfield Drive at SR 292 (addition of exclusive SB left turn lane)	\$249,784.00
Safety Improvements - Trimming and maintenance of trees and foliage around 3 intersections	N/A
Construction of turn lanes at SR 292 and Wade Avenue	\$583,212.00*
Intersection modifications at SR 292 and Navy Boulevard	\$499,568.00*
Widening of SR 292 to 3 lanes from the end of the current 3 lane section Blue Angel Parkway	\$7,734,199.00*

These costs on the most current (October 2009) FDOT District 3 preliminary cost estimates.

CEI is normally 15% of the construction cost and is not included in these estimates.

**Potential ROW acquisitions and drainage costs are not included in these estimates.*

X. CONSISTENCY WITH / CHANGES TO THE COMPREHENSIVE PLAN & LAND DEVELOPMENT CODE

In order to provide bicycle and pedestrian facilities on the SR 292 Corridor, Policy 8.A.2.2. of the Transportation Element of the Escambia County Comprehensive Plan should be adhered to. This policy states, “The county shall continue its practice of providing or requiring the provision of non-motorized transportation facilities to link residential areas with recreational and commercial areas in a safe manner. This may include the construction of sidewalks, bike lanes, installation of signage, striping of roadways, or the like so as to accommodate non-motorized transportation facilities (also, see Policy 8.A.3.4).”

As a proposed four-lane facility, right-of-way for the SR 292 Corridor needs to be preserved now in order to avoid additional right-of-way expenses and / or costly eminent domain in the future. This can be accomplished by ensuring that setback requirements are in place when development occurs and by monitoring development approvals for consistency with planned transportation improvements. Objective 8.A.4 and its policies address the issue of preservation of right-of-way. Policy 8.A.4.1 states that, prior to a Project Development and Environmental Impact Study (PD&E), the standard right-of-way of 80 feet for Major Collectors, 125 feet for Major Arterials, and 300 feet for Beltways, and this standard is enforced in the Escambia County Land Development Code. While this objective and its policies, if upheld, will save right-of-way needed for the SR 292 Corridor, it is imperative that development is required to adhere to the adopted Comprehensive Plan and Land Development Code.

APPENDIX A

TRAFFIC COUNTS & TURNING MOVEMENT COUNTS

HSA Consulting Group, Inc.
1315 Country Club Road
Gulf Breeze, Florida 32563

Location: Gulf Beach Hwy Between Dogtrack Rd & Fairfield Dr
County: Escambia Station #: 3
Start Date: 1-Sep-09 Start Time: 0:00

Time	Eastbound					Westbound					Combined
	1st	2nd	3rd	4th	Hour Tot.	1st	2nd	3rd	4th	Hour Tot.	
0:00	17	10	6	7	40	14	15	7	8	44	84
1:00	9	7	6	8	30	8	10	13	6	37	67
2:00	5	6	4	8	23	3	8	11	1	23	46
3:00	6	3	7	6	22	12	9	3	5	29	51
4:00	8	15	16	9	48	8	7	11	7	33	81
5:00	26	35	53	42	156	10	12	18	37	77	233
6:00	45	86	130	128	389	34	38	70	88	230	619
7:00	196	246	293	182	917	104	153	92	100	449	1366
8:00	157	128	148	102	535	78	92	102	118	390	925
9:00	110	120	138	130	498	100	101	90	86	377	875
10:00	92	120	128	115	455	87	98	78	96	359	814
11:00	104	132	120	118	474	103	98	119	109	429	903
12:00	101	122	118	104	445	114	115	112	106	447	892
13:00	118	133	123	138	512	150	140	168	159	617	1129
14:00	166	162	125	110	563	158	116	131	131	536	1099
15:00	138	135	124	126	523	154	136	164	166	620	1143
16:00	137	197	152	148	634	172	176	200	186	734	1368
17:00	132	138	138	108	516	208	230	196	184	818	1334
18:00	126	115	108	99	448	164	157	150	155	626	1074
19:00	82	92	86	76	336	105	126	107	79	417	753
20:00	82	62	57	37	238	93	84	115	77	369	607
21:00	48	51	44	46	189	75	70	62	74	281	470
22:00	34	46	36	20	136	50	53	23	34	160	296
23:00	33	20	22	6	81	18	32	28	15	93	174
Total					8208					8195	16403

Peak Hour Summary

	Direction: Eastbound	
	Hour	Volume
A.M.	7:00	917
P.M.	16:00	634
Daily	7:00	917

	Direction: Westbound	
	Hour	Volume
A.M.	11:30	457
P.M.	16:30	824
Daily	16:30	824

	Direction: Combined	
	Hour	Volume
A.M.	7:00	1366
P.M.	16:15	1399
Daily	16:15	1399

HSA Consulting Group, Inc.
1315 Country Club Road
Gulf Breeze, Florida 32563

Location: Gulf Beach Hwy Between Dogtrack Rd & Fairfield Dr
County: Escambia Station #: 3
Start Date: 2-Sep-09 Start Time: 0:00

Time	Eastbound					Westbound					Combined
	1st	2nd	3rd	4th	Hour Tot.	1st	2nd	3rd	4th	Hour Tot.	
0:00	19	8	9	8	44	22	28	16	11	77	121
1:00	8	6	7	6	27	9	5	5	6	25	52
2:00	7	5	3	4	19	8	12	8	6	34	53
3:00	1	3	3	5	16	8	13	6	8	35	51
4:00	10	22	11	16	59	4	7	13	9	33	92
5:00	30	34	36	48	148	9	8	28	36	81	229
6:00	54	89	122	148	413	28	46	58	84	216	629
7:00	178	230	288	230	926	120	154	107	80	461	1387
8:00	154	109	144	121	528	84	94	92	94	364	892
9:00	114	137	120	122	493	88	79	100	93	360	853
10:00	111	118	106	132	467	94	102	94	105	395	862
11:00	108	126	114	118	466	112	96	102	117	427	893
12:00	148	124	93	150	515	106	124	126	114	470	985
13:00	136	120	114	111	481	118	152	146	136	552	1033
14:00	176	160	146	122	604	125	98	132	144	499	1103
15:00	118	126	110	134	488	131	142	174	155	602	1090
16:00	132	152	146	164	594	190	158	218	204	770	1364
17:00	147	138	138	112	535	205	200	242	210	857	1392
18:00	104	120	96	85	406	148	160	140	104	552	958
19:00	72	55	74	64	265	99	98	106	103	406	671
20:00	50	54	61	35	201	96	68	67	94	325	526
21:00	59	45	41	38	183	65	55	80	60	260	443
22:00	38	35	24	28	125	65	29	35	27	156	281
23:00	27	17	8	5	61	26	32	22	17	97	158
Total					8064					8054	16118

Peak Hour Summary

	Direction: Eastbound	
	Hour	Volume
A.M.	7:00	925
P.M.	16:15	609
Daily	7:00	925

	Direction: Westbound	
	Hour	Volume
A.M.	11:45	473
P.M.	17:00	857
Daily	17:00	857

	Direction: Combined	
	Hour	Volume
A.M.	7:00	1387
P.M.	16:45	1438
Daily	16:45	1438

HSA Consulting Group, Inc.
1315 Country Club Road
Gulf Breeze, Florida 32563

Location: Sorrento Rd between Blue Angel Pkwy & Gulf Beach Hwy
County: Escambia Station #: 4
Start Date: 1-Sep-09 Start Time: 0:00

Time	Eastbound					Westbound					Combined Total
	1st	2nd	3rd	4th	Hour Tot.	1st	2nd	3rd	4th	Hour Tot.	
0:00	12	9	6	2	29	6	8	3	3	20	49
1:00	6	2	4	8	20	2	2	4	7	15	35
2:00	5	2	2	5	14	2	6	7	1	16	30
3:00	2	3	4	2	11	5	4	3	4	16	27
4:00	4	6	8	6	24	7	4	7	2	20	44
5:00	6	12	19	20	57	7	8	12	33	60	117
6:00	18	39	59	72	188	25	22	53	48	148	336
7:00	105	137	174	85	501	59	84	57	66	266	767
8:00	87	64	64	50	265	56	64	72	92	284	549
9:00	66	65	80	69	284	73	61	60	68	262	546
10:00	57	66	83	74	280	58	64	56	64	242	522
11:00	68	66	74	82	290	56	74	72	70	272	562
12:00	58	72	62	56	248	74	77	76	76	303	551
13:00	72	81	75	86	316	83	85	86	72	325	641
14:00	66	74	84	65	289	96	78	80	77	331	620
15:00	78	99	78	83	338	98	86	108	96	388	726
16:00	95	134	94	90	413	113	102	106	97	418	831
17:00	84	72	90	62	308	114	131	106	109	460	768
18:00	68	74	71	60	273	95	94	96	86	371	644
19:00	65	55	54	59	233	64	70	54	54	242	475
20:00	63	30	36	21	150	40	58	62	45	205	355
21:00	30	38	26	26	120	40	44	34	42	160	280
22:00	25	30	17	12	84	34	27	15	22	98	182
23:00	30	11	16	6	63	12	10	11	3	36	99
Total	4798					4958					9756

Peak Hour Summary

Direction: Eastbound		
Hour	Volume	
A.M.	700	501
P.M.	1600	413
Daily	700	501

Direction: Westbound		
Hour	Volume	
A.M.	815	301
P.M.	1700	460
Daily	1700	460

Direction: Combined		
Hour	Volume	
A.M.	700	767
P.M.	1600	831
Daily	1600	831

HSA Consulting Group, Inc.
1315 Country Club Road
Gulf Breeze, Florida 32563

Location: Sorrento Rd between Blue Angel Pkwy & Gulf Beach Hwy
County: Escambia Station #: 4
Start Date: 2-Sep-09 Start Time: 0:00

Time	Eastbound					Westbound					Combined Total
	1st	2nd	3rd	4th	Hour Tot.	1st	2nd	3rd	4th	Hour Tot.	
0:00	15	3	8	4	30	13	14	6	9	42	72
1:00	6	6	8	2	22	4	3	4	3	14	36
2:00	6	1	3	2	12	4	10	2	6	22	34
3:00	2	3	0	8	13	6	4	4	7	21	34
4:00	1	7	4	11	23	2	3	5	10	20	43
5:00	7	13	18	16	54	5	4	16	32	57	111
6:00	22	39	47	69	177	21	26	44	56	147	324
7:00	121	122	168	115	526	60	95	80	67	302	828
8:00	90	64	66	70	290	61	67	58	72	258	548
9:00	63	84	78	60	285	70	51	66	59	246	531
10:00	70	70	68	64	272	60	50	74	69	253	525
11:00	64	81	80	73	298	70	62	63	76	271	569
12:00	80	66	64	84	294	73	92	64	74	303	597
13:00	80	70	78	76	304	72	88	92	88	340	644
14:00	84	68	78	73	303	74	85	94	92	345	648
15:00	69	104	92	88	353	76	122	122	120	440	793
16:00	95	124	97	80	396	128	106	146	114	494	890
17:00	101	82	79	50	312	126	142	118	115	501	813
18:00	72	71	81	63	287	82	110	104	78	374	661
19:00	69	73	57	42	241	58	60	52	63	233	474
20:00	44	47	47	27	165	52	45	36	58	191	356
21:00	32	24	23	32	111	41	30	36	39	146	257
22:00	28	22	25	15	90	30	24	19	20	93	183
23:00	23	13	16	17	69	9	23	6	14	52	121
Total	4927					5165					10092

Peak Hour Summary

Direction: Eastbound		
Hour	Volume	
A.M.	700	526
P.M.	1615	402
Daily	700	526

Direction: Westbound		
Hour	Volume	
A.M.	1145	305
P.M.	1630	528
Daily	1630	528

Direction: Combined		
Hour	Volume	
A.M.	700	828
P.M.	1545	904
Daily	1545	904

HSA Consulting Group, Inc.
1315 Country Club Road
Gulf Breeze, Florida 32563

Location: Gulf Beach Hwy Between Fairfield & Patton
County: Escambia Station #: 2
Start Date: 1-Sep-09 Start Time: 0:00

Time	Eastbound					Westbound					Combined
	1st	2nd	3rd	4th	Hour Tot.	1st	2nd	3rd	4th	Hour Tot.	
0:00	14	15	9	10	48	26	16	13	16	71	119
1:00	11	10	8	10	39	13	8	19	7	47	86
2:00	9	6	4	10	29	10	12	11	10	43	72
3:00	16	8	12	7	43	12	14	10	6	42	85
4:00	11	21	24	27	83	8	12	6	3	29	112
5:00	40	68	93	84	285	15	16	31	39	101	386
6:00	94	158	214	225	691	25	54	60	102	241	932
7:00	300	323	332	255	1210	101	114	102	104	421	1631
8:00	219	188	210	164	781	113	114	126	102	455	1236
9:00	136	161	172	163	632	96	114	106	111	427	1059
10:00	130	146	152	147	575	134	120	134	128	516	1091
11:00	154	160	167	160	641	124	146	154	152	576	1217
12:00	159	161	166	150	636	164	162	166	170	662	1298
13:00	161	160	171	165	657	168	158	188	172	686	1343
14:00	167	206	183	137	693	198	176	180	210	764	1457
15:00	160	173	156	158	647	208	221	234	246	909	1556
16:00	159	170	204	184	717	266	260	215	274	1015	1732
17:00	167	164	154	150	635	289	294	248	232	1063	1698
18:00	132	149	126	134	541	226	200	192	164	782	1323
19:00	119	99	109	90	417	156	154	132	111	553	970
20:00	77	76	92	56	301	149	144	122	107	522	823
21:00	57	77	65	44	243	124	98	94	96	412	655
22:00	49	47	39	24	159	86	62	48	50	246	405
23:00	34	23	25	18	100	54	32	34	33	153	253
Total	10803					10736					21539

Peak Hour Summary

	Direction: Eastbound	
	Hour	Volume
A.M	700	1210
P.M	1615	725
Daily	700	1210

	Direction: Westbound	
	Hour	Volume
A.M	1145	644
P.M	1645	1105
Daily	1645	1105

	Direction: Combined	
	Hour	Volume
A.M	700	1631
P.M	1630	1791
Daily	1630	1791

HSA Consulting Group, Inc.
1315 Country Club Road
Gulf Breeze, Florida 32563

Location: Gulf Beach Hwy Between Fairfield & Patton
County: Escambia Station #: 2
Start Date: 2-Sep-09 Start Time: 0:00

Time	Eastbound					Westbound					Combined
	1st	2nd	3rd	4th	Hour Tot.	1st	2nd	3rd	4th	Hour Tot.	
0:00	22	15	9	12	58	36	24	30	16	106	164
1:00	13	8	6	8	35	13	9	4	11	37	72
2:00	6	8	4	9	27	8	16	8	12	44	71
3:00	4	9	7	8	28	17	10	13	8	48	76
4:00	13	23	25	27	88	2	6	9	10	27	115
5:00	43	60	85	96	284	8	18	26	29	81	365
6:00	95	137	211	230	673	25	52	64	102	243	916
7:00	260	304	350	286	1200	94	117	108	96	415	1615
8:00	237	191	210	160	798	98	100	92	113	403	1201
9:00	142	167	183	173	665	94	108	118	134	454	1119
10:00	136	132	145	142	555	122	127	122	118	489	1044
11:00	152	162	150	134	598	138	128	135	178	579	1177
12:00	174	155	147	147	623	142	146	158	136	582	1205
13:00	169	163	174	155	661	156	178	179	156	669	1330
14:00	168	182	175	172	697	170	182	176	204	732	1429
15:00	157	141	138	154	590	194	208	235	208	845	1435
16:00	141	146	167	179	633	237	288	258	276	1059	1692
17:00	182	161	158	155	656	282	312	259	198	1051	1707
18:00	137	146	131	99	513	226	200	192	176	794	1307
19:00	103	66	87	85	341	155	134	124	146	559	900
20:00	67	65	70	86	288	122	122	140	102	486	774
21:00	74	80	56	44	254	95	90	92	66	343	597
22:00	45	42	34	23	144	57	53	50	42	202	346
23:00	38	23	12	6	79	44	26	38	35	143	222
Total	10488					10391					20879

Peak Hour Summary

	Direction: Eastbound	
	Hour	Volume
A.M	700	1200
P.M	1400	697
Daily	700	1200

	Direction: Westbound	
	Hour	Volume
A.M	1145	624
P.M	1645	1129
Daily	1645	1129

	Direction: Combined	
	Hour	Volume
A.M	700	1615
P.M	1630	1817
Daily	1630	1817

HSA Consulting Group, Inc.
1315 Country Club Road
Gulf Breeze, Florida 32563

Location: Gulf Beach Hwy Between Patton & Navy
County: Escambia Station #: 1
Start Date: 1-Sep-09 Start Time: 0:00

Time	Eastbound					Westbound					Combined
	1st	2nd	3rd	4th	Hour Tot.	1st	2nd	3rd	4th	Hour Tot.	
0:00	6	10	5	9	30	15	13	10	10	48	78
1:00	5	9	6	10	30	9	8	8	5	30	60
2:00	5	4	2	9	20	7	5	8	8	28	48
3:00	12	4	12	5	33	8	11	7	4	30	63
4:00	9	16	22	20	67	8	7	3	4	22	89
5:00	27	56	65	60	208	11	10	25	30	76	284
6:00	77	108	171	163	519	21	38	44	83	186	705
7:00	234	240	264	213	951	76	88	71	93	328	1279
8:00	189	164	176	151	680	101	101	98	90	390	1070
9:00	109	139	159	145	552	74	96	102	85	357	909
10:00	114	123	126	118	481	116	102	117	98	433	914
11:00	142	135	142	130	549	105	115	136	121	477	1026
12:00	136	146	147	123	552	132	136	137	131	536	1088
13:00	141	137	143	144	565	133	129	148	136	546	1111
14:00	141	160	149	126	576	155	135	135	171	596	1172
15:00	139	137	133	136	545	168	166	196	186	716	1261
16:00	138	158	173	156	625	214	210	177	229	830	1455
17:00	128	134	127	120	509	233	231	194	192	850	1359
18:00	94	113	99	106	412	169	145	158	130	602	1014
19:00	104	82	86	68	340	122	131	111	85	449	789
20:00	63	56	67	41	227	116	116	109	81	422	649
21:00	42	55	50	31	178	90	73	75	62	300	478
22:00	33	35	35	17	120	61	58	40	37	196	316
23:00	27	19	21	16	83	47	22	23	27	119	202
Total					8852					8567	17419

Peak Hour Summary

	Direction: Eastbound	
	Hour	Volume
A.M.	700	951
P.M.	1600	625
Daily	700	951

	Direction: Westbound	
	Hour	Volume
A.M.	1145	526
P.M.	1645	887
Daily	1645	887

	Direction: Combined	
	Hour	Volume
A.M.	700	1279
P.M.	1615	1464
Daily	1615	1464

HSA Consulting Group, Inc.
1315 Country Club Road
Gulf Breeze, Florida 32563

Location: Gulf Beach Hwy Between Patton & Navy
County: Escambia Station #: 1
Start Date: 2-Sep-09 Start Time: 0:00

Time	Eastbound					Westbound					Combined
	1st	2nd	3rd	4th	Hour Tot.	1st	2nd	3rd	4th	Hour Tot.	
0:00	18	11	9	10	48	31	19	22	11	83	131
1:00	11	9	5	7	32	12	8	1	11	32	64
2:00	6	9	5	8	28	5	7	6	9	27	55
3:00	3	7	7	6	23	15	11	9	6	41	64
4:00	9	18	23	13	63	1	4	7	8	20	83
5:00	30	42	60	60	192	4	15	20	22	61	253
6:00	73	106	178	173	530	22	37	50	94	203	733
7:00	205	244	267	246	962	75	87	78	84	324	1286
8:00	199	161	180	152	692	84	89	76	98	347	1039
9:00	133	148	160	161	602	75	106	106	111	398	1000
10:00	117	116	125	129	487	95	106	98	98	397	884
11:00	130	139	134	110	513	109	111	118	131	469	982
12:00	148	129	133	118	528	120	120	128	105	473	1001
13:00	152	144	145	125	566	113	145	156	131	545	1111
14:00	142	155	146	154	597	138	147	146	167	598	1195
15:00	139	124	131	132	526	161	168	189	171	689	1215
16:00	111	126	134	144	515	199	230	198	222	849	1364
17:00	162	124	115	126	527	226	256	212	145	839	1366
18:00	107	122	102	75	406	191	156	143	140	630	1036
19:00	74	53	73	59	259	112	123	110	111	456	715
20:00	52	49	57	62	220	103	95	111	82	391	611
21:00	59	52	39	35	185	74	61	72	54	261	446
22:00	40	37	27	16	120	44	49	39	38	170	290
23:00	39	16	12	21	88	41	24	25	26	116	204
Total					8709					8419	17128

Peak Hour Summary

	Direction: Eastbound	
	Hour	Volume
A.M.	700	962
P.M.	1400	597
Daily	700	962

	Direction: Westbound	
	Hour	Volume
A.M.	1145	499
P.M.	1645	916
Daily	1645	916

	Direction: Combined	
	Hour	Volume
A.M.	715	1289
P.M.	1630	1466
Daily	1630	1466

SR 292 CORRIDOR MANAGEMENT PLAN

HSA CONSULTING GROUP, INC.
1315 COUNTRY CLUB RD.
GULF BREEZE, FLA. 32563

ALL VEHICLES																
INTERSECTION OF		Gulf Beach Hwy				&		Dog Track Rd								
		COUNTED BY: KB				COUNT DATE:		1 Sep 09				FILE NAME: gulf bek & dogtrack.xls				
		Dog Track Rd Southbound				Gulf Beach Hwy Westbound				Gulf Beach Hwy Eastbound				TOTAL		
Time		Left		Right		Thru	Right			Left	Thru					
6:00		3		5		26	7			3	44					88
6:15		7		12		31	4			4	79					137
6:30		14		4		49	3			4	107					181
6:45		23		15		56	18			7	108					227
TOTAL		47		36		162	32			18	338					633
7:00		12		12		99	16			8	153					300
7:15		10		26		138	15			16	204					409
7:30		23		16		107	12			17	263					438
7:45		27		8		72	13			10	226					356
TOTAL		72		62		416	56			51	846					1503
8:00		8		1		76	11			9	149					254
8:15		6		7		75	14			1	98					201
8:30		7		3		75	13			6	113					217
8:45		8		3		90	8			3	125					237
TOTAL		29		14		316	46			19	485					909
12:00		10		14		101	11			2	87					225
12:15		14		10		106	8			3	100					241
12:30		14		8		101	15			13	99					250
12:45		12		7		93	11			7	94					224
TOTAL		50		39		401	45			25	380					940
13:00		13		8		122	18			6	105					272
13:15		15		16		113	17			4	113					278
13:30		9		11		136	27			7	103					293
13:45		8		14		137	18			6	123					306
TOTAL		45		49		508	80			23	444					1149
16:00		16		6		150	15			6	121					314
16:15		20		6		159	20			15	167					387
16:30		15		4		158	18			10	132					337
16:45		17		6		168	22			9	125					347
TOTAL		68		22		635	75			40	545					1385
17:00		13		8		166	21			9	127					344
17:15		17		10		209	23			9	127					395
17:30		7		8		177	24			11	109					336
17:45		19		11		180	21			7	111					349
TOTAL		56		37		732	80			36	474					1424
18:00		9		8		150	17			4	106					294
18:15		17		11		134	13			11	108					294
18:30		12		7		121	17			7	95					259
18:45		20		10		150	15			3	84					282
TOTAL		58		36		555	62			25	393					1129

PEAK HOUR DATA 6:00 TO 8:45							
PEAK HR START TIME	7:00						
	Dog Track Rd Southbound		Gulf Bch Hwy Westbound		Gulf Bch Hwy Eastbound		
	Left	Right	Thru	Right	Left	Thru	TOTAL
PEAK HR TOTALS	72	62	416	56	51	846	1503
% OF APPROACH	53.7%	46.3%	88.1%	11.9%	5.7%	94.3%	
PEAK HR FACTOR	0.859		0.771		0.801		

PEAK HOUR DATA 12:00 TO 13:45							
PEAK HR START TIME	13:00						
	Dog Track Rd Southbound		Gulf Bch Hwy Westbound		Gulf Bch Hwy Eastbound		TOTAL
	Left	Right	Thru	Right	Left	Thru	
PEAK HR TOTALS	45	49	508	80	23	444	1149
% OF APPROACH	47.9%	52.1%	86.4%	13.6%	4.9%	95.1%	
PEAK HR FACTOR	0.758		0.902		0.905		

PEAK HOUR DATA 16:00 TO 18:45							
PEAK HR START TIME	17:00						
	Dog Track Rd Southbound		Gulf Bch Hwy Westbound		Gulf Bch Hwy Eastbound		TOTAL
	Left	Right	Thru	Right	Left	Thru	
PEAK HR TOTALS	56	37	732	89	36	474	
% OF APPROACH	60.2%	39.8%	89.2%	10.8%	7.1%	92.9%	
PEAK HR FACTOR	0.775		0.885		0.938		

SR 292 CORRIDOR MANAGEMENT PLAN

HSA CONSULTING GROUP, INC.
1315 COUNTRY CLUB RD.
GULF BREEZE, FLA. 32563

INTERSECTION OF		ALL VEHICLES															
		Gulf Beach Hwy				&				Fairfield Drive							
		COUNTED BY: JD				COUNT DATE: 2-Sep-09				FILE NAME: gulf bch & fairfield.xls							
Time	Fairfield Dr Southbound				Gulf Beach Hwy Westbound				Fairfield Dr Northbound				Gulf Beach Hwy Eastbound				TOTAL
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	
6:00	9	0	4	0	1	32	2	1	1	0	3	0	8	61	0	0	122
6:15	13	0	9	0	1	26	4	0	1	2	1	0	24	88	0	0	169
6:30	20	0	9	0	1	56	7	0	1	5	2	0	26	134	0	0	261
6:45	28	1	12	0	0	65	4	0	1	2	1	1	19	117	1	0	252
TOTAL	70	1	34	0	3	179	17	1	4	9	7	1	77	400	1	0	804
7:00	20	1	26	0	0	72	10	0	1	4	4	0	25	175	1	0	339
7:15	46	1	20	0	1	88	12	0	1	2	1	0	42	212	0	0	426
7:30	36	1	27	0	2	68	9	0	4	1	4	0	47	260	1	0	460
7:45	26	0	16	0	0	77	19	0	0	4	2	0	52	214	0	0	410
TOTAL	128	3	89	0	3	305	50	0	6	11	11	0	166	861	2	0	1635
8:00	20	2	17	0	0	68	15	0	0	5	2	0	37	169	0	0	335
8:15	21	1	14	0	2	81	9	0	1	1	1	0	25	103	2	0	261
8:30	12	2	21	0	0	71	9	0	0	1	1	0	33	146	0	0	296
8:45	18	2	28	0	2	65	6	0	2	4	1	0	24	109	1	0	262
TOTAL	71	7	80	0	4	285	39	0	3	11	5	0	119	527	3	0	1154
12:00	24	3	29	0	1	110	20	0	0	0	2	0	31	113	1	0	334
12:15	14	0	25	0	3	110	10	0	2	1	1	0	24	122	4	0	316
12:30	15	2	35	1	1	100	11	0	0	1	1	0	30	94	3	0	294
12:45	19	2	19	0	1	111	13	0	2	2	3	0	27	98	1	0	298
TOTAL	72	7	108	1	6	431	54	0	4	4	7	0	112	427	9	0	1242
13:00	15	2	30	0	2	90	12	0	4	3	1	0	31	111	2	0	303
13:15	14	3	26	0	1	139	8	0	2	0	2	0	22	117	4	0	338
13:30	14	2	32	1	0	120	10	0	1	5	2	0	24	121	2	0	334
13:45	15	5	33	0	6	120	13	0	4	1	0	0	14	102	2	0	315
TOTAL	58	12	121	1	9	469	43	0	11	9	5	0	91	451	10	0	1290
16:00	14	5	41	0	2	168	14	0	2	0	0	0	28	92	1	0	367
16:15	16	1	50	0	1	142	24	0	4	1	1	0	35	102	2	0	379
16:30	22	2	50	0	4	201	22	0	4	4	3	0	25	119	1	0	457
16:45	16	1	56	0	3	177	13	0	2	3	0	0	34	107	1	0	413
TOTAL	68	9	197	0	10	688	73	0	12	8	4	0	122	420	5	0	1616
17:00	16	3	48	1	3	195	16	0	4	1	2	0	28	126	2	0	445
17:15	17	1	42	0	2	219	14	0	1	2	0	0	31	109	2	0	440
17:30	20	5	50	0	1	235	7	0	2	4	2	0	39	106	0	0	471
17:45	20	1	43	0	1	174	15	0	1	3	2	0	28	97	1	0	386
TOTAL	73	10	183	1	7	823	52	0	8	10	6	0	126	438	5	0	1742
18:00	17	0	39	0	0	140	11	0	2	0	0	0	26	95	0	0	330
18:15	11	4	45	0	1	133	11	0	2	0	2	0	24	99	3	0	335
18:30	23	2	29	0	0	134	12	0	3	1	3	0	13	85	0	0	305
18:45	13	2	22	0	3	99	9	0	0	3	1	0	19	66	4	0	241
TOTAL	64	8	135	0	4	506	43	0	7	4	6	0	82	345	7	0	1211

PEAK HOUR DATA 6:00 TO 8:45																	
PEAK HR START TIME	7:00																
	Fairfield Drive Southbound				Gulf Bch Hwy Westbound				Fairfield Drive Northbound				Gulf Bch Hwy Eastbound				
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	TOTAL
PEAK HR TOTALS	128	3	89	0	3	305	50	0	6	11	11	0	166	861	2	0	1635
% OF APPROACH	58.2%	1.4%			0.8%	85.2%			21.4%	39.3%			16.1%	83.7%	0.2%	0.0%	
PEAK HR FACTOR	0.821				0.886				0.778				0.835				

PEAK HOUR DATA 12:00 TO 13:45																	
PEAK HR START TIME	12:00																
	Fairfield Drive Southbound				Gulf Bch Hwy Westbound				Fairfield Drive Northbound				Gulf Bch Hwy Eastbound				
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	TOTAL
PEAK HR TOTALS	58	12	121	1	9	459	43	0	11	9	5	0	91	451	10	0	1290
% OF APPROACH	30.2%	6.3%			1.7%	90.0%			44.0%	36.0%	20.0%	0.0%	16.5%	81.7%			
PEAK HR FACTOR		0.906				0.880				0.781				0.939			

PEAK HOUR DATA 16:00 TO 18:45																	
PEAK HR START TIME	16:45																
	Fairfield Drive Southbound				Gulf Bch Hwy Westbound				Fairfield Drive Northbound				Gulf Bch Hwy Eastbound				
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	TOTAL
PEAK HR TOTALS	69	10	196	1	9	826	50	0	9	10	4	0	132	448	5	0	1769
% OF APPROACH	25.0%	2.6%			1.0%	93.3%			39.1%	43.5%	17.4%	0.0%	22.6%	76.6%	0.9%	0.0%	
PEAK HR FACTOR	0.920				0.910				0.719				0.938				

SR 292 CORRIDOR MANAGEMENT PLAN

HSA CONSULTING GROUP, INC.
1315 COUNTRY CLUB RD.
GULF BREEZE, FLA 32563

INTERSECTION OF		Gulf Beach Hwy				&		Patton Drive			
		COUNTED BY: CD		COUNT DATE: 1-Sep-09		FILE NAME: gulf bch & patton.xls					
Time	Patton Dr Southbound			Gulf Beach Hwy Westbound			Gulf Beach Hwy Eastbound			TOTAL	
	Left		Right		Thru	Right		Left	Thru		
6:00	2		6		21	1		6	67	103	
6:15	0		6		27	0		17	105	155	
6:30	1		8		41	3		13	148	214	
6:45	2		11		72	6		30	170	291	
TOTAL	5		31		161	10		66	490	763	
7:00	3		27		82	11		38	180	341	
7:15	9		31		64	9		29	241	383	
7:30	5		35		84	7		46	236	413	
7:45	6		15		67	2		29	237	356	
TOTAL	23		108		297	29		142	694	1493	
8:00	1		15		74	3		23	202	318	
8:15	1		15		95	3		14	157	285	
8:30	1		23		71	2		21	177	295	
8:45	1		16		70	2		18	178	285	
TOTAL	4		69		310	10		76	714	1183	
12:00	2		38		131	5		18	132	326	
12:15	6		42		142	4		20	135	349	
12:30	4		29		120	4		19	131	307	
12:45	5		33		122	5		32	113	310	
TOTAL	17		142		515	18		89	511	1292	
13:00	6		35		140	6		22	127	336	
13:15	4		28		124	3		28	125	312	
13:30	4		35		140	5		20	145	349	
13:45	6		37		127	8		33	115	326	
TOTAL	20		135		531	22		103	512	1323	
16:00	4		48		201	5		20	122	400	
16:15	5		50		201	3		15	153	427	
16:30	5		48		180	2		24	166	425	
16:45	5		49		217	6		17	132	426	
TOTAL	19		195		799	16		76	573	1678	
17:00	5		51		214	2		34	120	426	
17:15	4		60		231	5		26	114	440	
17:30	2		54		195	5		15	125	396	
17:45	0		42		171	2		30	106	351	
TOTAL	11		207		811	14		105	465	1613	
18:00	2		40		181	8		31	87	340	
18:15	2		51		133	4		26	103	319	
18:30	1		46		144	0		26	83	300	
18:45	0		27		132	5		25	96	285	
TOTAL	5		164		590	17		108	369	1253	

PEAK HOUR DATA 6:00 TO 8:45							
PEAK HR START TIME	7:00						
	Patton Drive Southbound		Gulf Bch Hwy Westbound		Gulf Bch Hwy Eastbound		
	Left	Right	Thru	Right	Left	Thru	TOTAL
PEAK HR TOTALS	23	108	297	29	142	894	1493
% OF APPROACH	17.6%	82.4%	91.1%	8.9%	13.7%	86.3%	
PEAK HR FACTOR	0.819		0.876		0.918		

PEAK HOUR DATA 12:00 TO 13:45							
PEAK HR START TIME	13:00						
	Patton Drive		Gulf Bch Hwy		Gulf Bch Hwy		
	Left	Right	Thru	Right	Left	Thru	TOTAL
PEAK HR TOTALS	20	135	531	22	103	512	1323
% OF APPROACH	12.9%	87.1%	96.0%	4.0%	16.7%	83.3%	
PEAK HR FACTOR	0.901		0.947		0.932		

PEAK HOUR DATA 16:00 TO 18:45							
PEAK HR START TIME	16:30						
	Patton Drive Southbound		Gulf Bch Hwy Westbound		Gulf Bch Hwy Eastbound		TOTAL
	Left	Right	Thru	Right	Left	Thru	
PEAK HR TOTALS	19	208	842	15	101	532	1717
% OF APPROACH	8.4%	91.6%	98.2%	1.8%	16.0%	84.0%	
PEAK HR FACTOR	0.887		0.908		0.833		

SR 292 CORRIDOR MANAGEMENT PLAN

HSA CONSULTING GROUP, INC.
1315 COUNTRY CLUB RD.
GULF BREEZE, FLA. 32563

INTERSECTION OF		Gulf Beach Hwy				&		Sorrento Road											
		COUNTED BY: GS				COUNT DATE: 1-Sep-09				FILE NAME: gulf bch & sorrento.xls									
						Gulf Beach Hwy (SR 292)				Gulf Beach Hwy (CR 292A)				Sorrento Rd					
						Westbound				Northbound				Eastbound					
Time						Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		TOTAL	
6:00						7	28			3		14			24	5		85	
6:15						12	17			0		34			41	9		113	
6:30						21	39			2		47			66	7		177	
6:45						36	42			1		44			65	9		197	
TOTAL						76	126			6		138			196	30		572	
7:00						57	43			2		55			113	12		282	
7:15						70	64			5		67			149	24		379	
7:30						76	66			18		118			162	28		468	
7:45						28	44			8		85			130	5		300	
TOTAL						231	217			33		325			554	69		1429	
8:00						14	49			2		54			87	5		211	
8:15						25	62			1		41			67	0		196	
8:30						26	67			3		51			80	1		228	
8:45						20	81			3		41			63	2		210	
TOTAL						85	259			9		187			297	8		845	
9:00						39	66			4		27			60	4		200	
9:15						36	81			1		30			64	7		219	
9:30						32	73			1		41			68	5		220	
9:45						23	75			8		49			58	9		222	
TOTAL						130	295			14		147			250	25		861	
10:00						42	75			9		26			68	5		225	
10:15						51	79			5		34			76	7		256	
10:30						62	82			5		39			76	5		269	
10:45						68	86			9		43			86	8		300	
TOTAL						223	322			28		146			306	25		1050	
11:00						49	102			11		41			76	10		289	
11:15						48	106			2		46			131	6		339	
11:30						57	113			4		41			100	8		323	
11:45						55	105			3		40			82	5		290	
TOTAL						209	426			20		168			389	29		1241	
12:00						52	118			2		42			90	4		308	
12:15						79	128			11		44			84	3		353	
12:30						65	120			1		54			66	5		311	
12:45						60	124			5		34			72	11		310	
TOTAL						256	490			19		182			312	23		1282	
13:00						53	103			8		37			67	8		276	
13:15						45	85			1		24			78	7		244	
13:30						45	95			7		37			64	5		253	
13:45						50	97			6		27			57	11		248	
TOTAL						193	380			22		129			246	31		1021	

PEAK HOUR DATA 6:00 TO 8:45							
PEAK HR START TIME	<div>7:00</div>						
	Gulf Beach Hwy (SR 292)		Gulf Beach Hwy (CR 292A)		Sorrento Rd		
	Westbound		Northbound		Eastbound		
	Left	Thru	Left	Right	Thru	Right	TOTAL
PEAK HR TOTALS	231	217	33	325	554	69	1429
% OF APPROACH	51.6%	48.4%	9.2%	90.8%	88.9%	11.1%	
PEAK HR FACTOR	0.789		0.658		0.820		

PEAK HOUR DATA 12:00 TO 13:45							
PEAK HR START TIME	13:00						
		Gulf Beach Hwy (SR 292)		Gulf Beach Hwy (CR 292A)		Sorrento Rd	
		Westbound		Northbound		Eastbound	
		Left	Thru	Left	Right	Thru	Right
PEAK HR TOTALS		223	322	28	146	306	25
% OF APPROACH		40.9%	59.1%	16.1%	83.9%	92.4%	7.6%
PEAK HR FACTOR		0.885		0.837		0.880	
TOTAL							
1050							

PEAK HOUR DATA 16:00 TO 18:45								
PEAK HR START TIME	17:00							
		Gulf Beach Hwy (SR 292)		Gulf Beach Hwy (CR 292A)		Sorrento Rd		
		Westbound		Northbound		Eastbound		
		Left	Thru	Left	Right	Thru	Right	TOTAL
PEAK HR TOTALS		256	490	19	182	312	23	1282
% OF APPROACH		34.3%	65.7%	9.5%	90.5%	93.1%	6.9%	
PEAK HR FACTOR		0.901		0.852		0.891		

SR 292 CORRIDOR MANAGEMENT PLAN

HSA CONSULTING GROUP, INC.
1315 COUNTRY CLUB RD.
GULF BREEZE, FLA. 32563

INTERSECTION OF		Sorrento Road				&				Blue Angel Pkwy									
		COUNTED BY: DB				COUNT DATE: 1-Sep-09				FILE NAME: sorrento & blueangel.xls									
		Blue Angel Pkwy Southbound				Sorrento Rd Westbound				Blue Angel Pkwy Northbound				Sorrento Rd Eastbound					
Time		Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	TOTAL	
6:00		4	62	9	2	4	17	0	3	3	35	1	3	26	11	3	3	186	
6:15		4	77	17	13	4	12	1	2	7	48	7	2	27	34	4	4	263	
6:30		3	113	21	16	13	27	4	4	5	66	2	7	43	31	18	0	382	
6:45		10	111	13	15	8	28	8	4	5	69	10	6	41	50	9	15	402	
TOTAL		21	363	60	46	29	84	13	13	20	218	20	18	137	126	34	31	1233	
7:00		17	81	15	10	9	49	3	5	10	87	7	16	60	69	4	3	445	
7:15		15	79	19	22	10	56	1	4	22	129	27	13	54	79	8	10	554	
7:30		27	98	15	32	24	60	1	9	19	108	20	20	80	98	17	10	638	
7:45		28	88	31	14	14	37	4	11	10	90	18	12	77	88	11	6	539	
TOTAL		87	346	80	78	63	202	9	29	61	414	72	61	271	334	40	29	2176	
8:00		15	60	20	19	14	40	9	2	2	65	11	6	46	77	5	4	395	
8:15		18	65	16	20	12	45	3	2	8	47	6	9	63	39	8	2	363	
8:30		17	55	33	13	8	47	6	3	9	62	7	3	39	43	3	1	349	
8:45		13	33	42	13	22	60	3	2	14	58	4	3	54	54	1	3	379	
TOTAL		63	213	111	65	56	192	21	9	33	232	28	21	202	213	17	10	1486	
9:00																			
9:15																			
9:30																			
9:45																			
TOTAL																			
12:00		26	47	15	17	14	55	3	8	23	60	7	3	45	42	7	8	380	
12:15		27	66	19	35	9	52	1	9	16	62	4	5	46	50	9	6	416	
12:30		23	54	31	15	13	61	5	0	0	60	8	5	43	43	8	6	391	
12:45		21	57	11	24	16	72	5	4	18	57	4	8	39	36	3	3	378	
TOTAL		97	224	76	91	52	240	14	30	66	239	23	21	172	170	27	23	1565	
13:00		12	56	22	17	12	52	6	5	10	48	5	4	40	56	3	3	351	
13:15		23	45	30	26	8	61	9	2	17	53	6	3	49	53	3	2	390	
13:30		18	46	22	33	19	71	8	6	16	50	3	4	51	47	6	5	405	
13:45		34	54	20	38	6	81	2	5	20	60	7	10	41	56	1	6	441	
TOTAL		87	201	94	114	45	265	25	18	63	211	21	21	181	212	13	16	1587	
14:00																			
14:15																			
14:30																			
14:45																			
TOTAL																			
16:00		31	68	44	34	14	87	10	8	35	117	7	7	61	59	4	4	590	
16:15		37	61	23	44	15	80	12	10	24	138	3	8	80	103	8	7	653	
16:30		50	83	26	13	20	101	9	14	28	85	4	6	46	61	8	1	555	
16:45		26	89	41	22	30	77	4	6	25	97	9	15	59	53	4	6	563	
TOTAL		144	301	134	113	79	345	35	38	112	437	23	36	246	276	24	18	2361	
17:00		24	88	23	35	17	91	4	10	15	66	6	6	61	55	2	5	508	
17:15		36	86	30	30	22	105	4	9	29	79	4	6	46	48	5	3	542	
17:30		50	76	43	23	20	92	4	10	23	65	2	5	60	44	5	9	531	
17:45		20	77	34	39	18	92	8	10	36	72	3	7	51	39	9	4	519	
TOTAL		130	327	130	127	77	380	20	39	103	282	15	24	218	186	21	21	2100	
18:00		19	62	32	35	13	71	11	6	10	52	2	3	53	60	8	8	445	
18:15		36	72	28	27	14	67	7	8	27	59	5	6	46	37	9	6	454	
18:30		23	41	22	28	15	90	3	7	17	38	1	7	44	40	6	4	386	
18:45		20	48	22	27	16	69	2	7	19	43	5	9	30	30	4	6	357	
TOTAL		98	223	104	117	58	297	23	28	73	192	13	25	173	167	27	24	1642	

PEAK HOUR DATA 6:00 TO 8:45																	
PEAK HR START TIME	7:00																
	Blue Angel Pkwy Southbound				Sorrento Rd Westbound				Blue Angel Pkwy Northbound				Sorrento Rd Eastbound				
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	TOTAL
PEAK HR TOTALS	87	346	80	78	63	202	9	29	61	414	72	61	271	334	40	29	2176
% OF APPROACH	14.7%	58.5%	13.5%	13.2%	20.8%	66.0%	3.0%	9.6%	10.0%	68.1%	11.8%	10.0%	40.2%	49.6%	5.9%	4.3%	
PEAK HR FACTOR	0.859				0.806				0.796				0.822				

PEAK HOUR DATA 12:00 TO 13:45																	
PEAK HR START TIME	13:00																
	Blue Angel Pkwy Southbound				Sorento Rd Westbound				Blue Angel Pkwy Northbound				Sorento Rd Eastbound				
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	TOTAL
PEAK HR TOTALS	87	201	94	114	45	265	25	18	63	211	21	21	181	212	13	16	1537
% OF APPROACH	17.5%	40.5%	19.0%	23.0%	12.7%	75.1%	7.1%	5.1%	19.9%	66.8%	6.6%	6.6%	42.9%	50.2%	3.1%	3.8%	
PEAK HR FACTOR	0.849				0.849				0.814				0.968				

PEAK HOUR DATA 16:00 TO 18:45																	
PEAK HR START TIME	16:00																
	Blue Angel Pkwy Southbound				Sorento Rd Westbound				Blue Angel Pkwy Northbound				Sorento Rd Eastbound				
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	TOTAL
PEAK HR TOTALS	144	301	134	113	79	345	35	38	112	437	23	36	246	276	24	18	2361
% OF APPROACH	20.8%	43.5%	19.4%	16.3%	15.9%	69.4%	7.0%	7.6%	18.4%	71.9%	3.3%	5.9%	43.6%	48.9%	4.3%	3.2%	
PEAK HR FACTOR	0.972				0.863				0.879				0.712				

APPENDIX B
SYNCHRO SOFTWARE REPORTS
EXISTING CONDITIONS

HCM Signalized Intersection Capacity Analysis 3: Sorrento Rd & Blue Angel Pkwy

2009 PM Peak
No Build












Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	→	↱	↰	→	↱	↰	→	↱	↰	→	↱
Volume (vph)	246	276	42	79	345	73	112	437	59	144	301	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.24	1.00	1.00	0.58	1.00	1.00	0.52	1.00	1.00	0.29	1.00	1.00
Satd. Flow (perm)	450	1863	1583	1075	1863	1583	976	3539	1583	541	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	267	300	48	86	375	79	122	475	64	157	327	268
RTOR Reduction (vph)	0	0	29	0	0	57	0	0	51	0	0	209
Lane Group Flow (vph)	267	300	17	86	375	22	122	475	13	157	327	59
Turn Type	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases	7	4	3	8	8	5	2	2	1	6	6	6
Permitted Phases	4	4	8	8	8	2	2	2	6	6	6	6
Actuated Green, G (s)	44.0	32.6	32.6	31.5	25.1	25.1	27.9	18.0	18.0	30.5	19.3	19.3
Effective Green, g (s)	44.0	32.6	32.6	31.5	25.1	25.1	27.9	18.0	18.0	30.5	19.3	19.3
Actuated g/C Ratio	0.50	0.37	0.37	0.36	0.28	0.28	0.32	0.20	0.20	0.35	0.22	0.22
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	433	689	585	434	530	450	398	722	323	343	774	346
v/s Ratio Prot	0.10	0.16	0.01	0.01	0.20	0.03	0.13	0.06	0.06	0.09	0.09	0.09
v/s Ratio Perm	0.21	0.01	0.06	0.01	0.06	0.01	0.10	0.01	0.10	0.04	0.04	0.04
v/c Ratio	0.62	0.44	0.03	0.20	0.71	0.05	0.31	0.66	0.04	0.46	0.42	0.17
Uniform Delay, d1	15.2	20.9	17.7	19.2	28.3	22.9	22.1	32.3	28.2	21.1	29.7	27.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	0.4	0.0	0.2	4.3	0.0	0.4	2.2	0.1	1.0	0.4	0.2
Delay (s)	17.8	21.3	17.7	19.4	32.6	22.9	22.6	34.4	28.2	22.1	30.0	28.2
Level of Service	B	C	B	B	C	C	C	C	C	C	C	C
Approach Delay (s)		19.5			29.1			31.7			27.7	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM Average Control Delay		27.1										
HCM Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		88.2						20.0				
Intersection Capacity Utilization		68.5%						C				
Analysis Period (min)		15										
c Critical Lane Group												

2009 PM Peak 10/2/2009 No Build

Synchro 7 - Report
Page 1

HCM Unsignalized Intersection Capacity Analysis 8: Sorrento Rd & Gulf Beach Hwy (CR 292A)

2009 PM Peak
No Build

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	312	23	256	490	19	182
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	339	25	278	533	21	198
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			364		1441	352
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			364		1441	352
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			77		82	71
cM capacity (veh/h)			1194		112	692
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	
Volume Total	364	278	533	21	198	
Volume Left	0	278	0	21	0	
Volume Right	25	0	0	0	198	
cSH	1700	1194	1700	112	692	
Volume to Capacity	0.21	0.23	0.31	0.18	0.29	
Queue Length 95th (ft)	0	23	0	16	29	
Control Delay (s)	0.0	8.9	0.0	44.3	12.3	
Lane LOS		A		E	B	
Approach Delay (s)	0.0	3.1		15.3		
Approach LOS				C		
Intersection Summary						
Average Delay		4.2				
Intersection Capacity Utilization		45.3%		ICU Level of Service	A	
Analysis Period (min)		15				

2009 PM Peak 10/2/2009 No Build

Synchro 7 - Report
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HCM Unsignalized Intersection Capacity Analysis

13: Gulf Beach Hwy & Dog Track Rd

2009 PM Peak
No Build

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↱	↰	↱	↰	↱
Volume (veh/h)	36	474	732	89	56	37
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	515	796	97	61	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	892				1389	796
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	892				1389	796
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				59	90
cM capacity (veh/h)	760				149	387
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	39	515	796	97	101	
Volume Left	39	0	0	0	61	
Volume Right	0	0	0	97	40	
cSH	760	1700	1700	1700	197	
Volume to Capacity	0.05	0.30	0.47	0.06	0.51	
Queue Length 95th (ft)	4	0	0	0	65	
Control Delay (s)	10.0	0.0	0.0	0.0	41.0	
Lane LOS	A				E	
Approach Delay (s)	0.7		0.0		41.0	
Approach LOS					E	
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization			50.6%		ICU Level of Service	A
Analysis Period (min)			15			

2009 PM Peak 10/2/2009 No Build

Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis

16: Gulf Beach Hwy & Fairfield Dr












2009 PM Peak
No Build

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱		↱	↱	↰	↱	↱
Volume (vph)	132	448	5	9	826	50	9	10	4	69	10	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		5.0	5.0			5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Flt	1.00	1.00		1.00	0.99			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.96	1.00
Satd. Flow (prot)	1770	1860		1770	1847			1787			1785	1583
Flt Permitted	0.08	1.00		0.48	1.00			0.87			0.74	1.00
Satd. Flow (perm)	145	1860		901	1847			1594			1370	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	487	5	10	898	54	10	11	4	75	11	214
RTOR Reduction (vph)	0	0	0	0	2	0	0	3	0	0	0	187
Lane Group Flow (vph)	143	492	0	10	950	0	0	22	0	0	86	27
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	4
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	66.1	66.1		50.1	50.1			11.2			11.2	11.2
Effective Green, g (s)	66.1	66.1		50.1	50.1			11.2			11.2	11.2
Actuated g/C Ratio	0.76	0.76		0.57	0.57			0.13			0.13	0.13
Clearance Time (s)	4.0	5.0		5.0	5.0			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	333	1408		517	1060			204			176	203
v/s Ratio Prot	c0.06	0.26			c0.51						c0.06	0.02
v/s Ratio Perm	0.27			0.01				0.01				0.02
v/c Ratio	0.43	0.35		0.02	0.90			0.11			0.49	0.14
Uniform Delay, d1	15.4	3.5		8.0	16.3			33.6			35.4	33.8
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.9	0.2		0.0	10.0			0.2			2.1	0.3
Delay (s)	16.3	3.7		8.0	26.3			33.9			37.5	34.1
Level of Service	B	A		A	C			C			D	C
Approach Delay (s)		6.5			26.1			33.9			35.1	
Approach LOS		A			C			C			D	
Intersection Summary												
HCM Average Control Delay		21.1						HCM Level of Service		C		
HCM Volume to Capacity ratio		0.76										
Actuated Cycle Length (s)		87.3						Sum of lost time (s)		14.0		
Intersection Capacity Utilization		74.5%						ICU Level of Service		D		
Analysis Period (min)		15										
c Critical Lane Group												

2009 PM Peak 10/2/2009 No Build

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HCM Unsignalized Intersection Capacity Analysis
21: Gulf Beach Hwy & Patton Dr2009 PM Peak
No Build

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	101	532	842	15	19	208
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	110	578	915	16	21	226
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						18
Median type		None	TWTL			
Median storage veh			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	932				1721	923
vC1, stage 1 conf vol					923	
vC2, stage 2 conf vol					798	
vCu, unblocked vol	932				1721	923
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	85				93	31
cM capacity (veh/h)	735				276	327
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	110	578	932	247		
Volume Left	110	0	0	21		
Volume Right	0	0	16	226		
cSH	735	1700	1700	357		
Volume to Capacity	0.15	0.34	0.55	0.69		
Queue Length 95th (ft)	13	0	0	124		
Control Delay (s)	10.8	0.0	0.0	35.9		
Lane LOS	B			E		
Approach Delay (s)	1.7		0.0	35.9		
Approach LOS				E		
Intersection Summary						
Average Delay			5.4			
Intersection Capacity Utilization			64.8%		ICU Level of Service	C
Analysis Period (min)			15			

2009 PM Peak 10/2/2009 No Build

Synchro 7 - Report
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Queuing and Blocking Report
Baseline2009 PM Peak
10/2/2009

Intersection: 3: Sorrento Rd & Blue Angel Pkwy

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	261	238	45	90	320	55	117	175	206	69	141	161
Average Queue (ft)	109	102	1	32	165	3	61	99	112	16	62	60
95th Queue (ft)	183	180	15	70	283	23	104	156	161	43	140	111
Link Distance (ft)		849			1018			923	923			864
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	470		330	545		320	565			495	555	
Storage Blk Time (%)					0							
Queuing Penalty (veh)					1							

Intersection: 3: Sorrento Rd & Blue Angel Pkwy

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	138	249
Average Queue (ft)	77	71
95th Queue (ft)	115	157
Link Distance (ft)	864	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	510	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Sorrento Rd & Gulf Beach Hwy (CR 292A)

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	22	92	53	114
Average Queue (ft)	1	47	20	57
95th Queue (ft)	10	78	49	89
Link Distance (ft)	1322		1874	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		220	320	
Storage Blk Time (%)				
Queuing Penalty (veh)				

2009 PM Peak

SimTraffic Report
Page 1Queuing and Blocking Report
Baseline2009 PM Peak
10/2/2009

Intersection: 13: Gulf Beach Hwy & Dog Track Rd

Movement	EB	WB	SB
Directions Served	L	R	LR
Maximum Queue (ft)	53	22	109
Average Queue (ft)	15	1	43
95th Queue (ft)	42	7	83
Link Distance (ft)		1444	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	150	315	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: Gulf Beach Hwy & Fairfield Dr

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	135	128	31	602	72	118	203
Average Queue (ft)	52	52	7	273	12	60	86
95th Queue (ft)	96	103	27	488	44	113	160
Link Distance (ft)		1223		1361	1724		1518
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	415		140			275	
Storage Blk Time (%)				15			
Queuing Penalty (veh)				1			

Intersection: 21: Gulf Beach Hwy & Patton Dr

Movement	EB	WB	SB	SB
Directions Served	L	TR	L	R
Maximum Queue (ft)	90	22	118	378
Average Queue (ft)	44	1	31	157
95th Queue (ft)	74	7	94	318
Link Distance (ft)		1899	2066	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100		460	
Storage Blk Time (%)	0			
Queuing Penalty (veh)	0			

Network Summary

Network wide Queuing Penalty: 2

























2009 PM Peak

SimTraffic Report
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APPENDIX C
SYNCHRO SOFTWARE REPORTS
FUTURE CONDITIONS

HCM Signalized Intersection Capacity Analysis
3: Sorrento Rd & Blue Angel Pkwy

2017 PM Peak
No Build

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	288	323	49	93	404	86	131	512	69	169	353	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.18	1.00	1.00	0.46	1.00	1.00	0.47	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	338	1863	1583	861	1863	1583	884	3539	1583	397	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	313	351	53	101	439	93	142	557	75	184	384	314
RTOR Reduction (vph)	0	0	34	0	0	65	0	0	59	0	0	238
Lane Group Flow (vph)	313	351	19	101	439	28	142	557	16	184	384	76
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	49.1	35.2	35.2	38.5	29.6	29.6	32.1	21.5	21.5	36.9	23.9	23.9
Effective Green, g (s)	49.1	35.2	35.2	38.5	29.6	29.6	32.1	21.5	21.5	36.9	23.9	23.9
Actuated g/C Ratio	0.50	0.36	0.36	0.39	0.30	0.30	0.33	0.22	0.22	0.37	0.24	0.24
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	379	665	565	418	559	475	383	772	345	330	858	384
v/s Ratio Prot	c0.12	0.19		0.02	0.24		0.04	c0.16		c0.07	0.11	
v/s Ratio Perm	c0.29		0.01	0.07		0.02	0.08		0.01	0.14		0.05
v/c Ratio	0.83	0.53	0.03	0.24	0.79	0.06	0.37	0.72	0.05	0.56	0.45	0.20
Uniform Delay, d1	18.8	25.1	20.6	19.6	31.6	24.6	24.4	35.8	30.5	22.5	31.7	29.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.7	0.8	0.0	0.3	7.2	0.1	0.6	3.3	0.1	2.0	0.4	0.3
Delay (s)	32.5	25.9	20.7	19.9	38.7	24.6	25.0	39.1	30.5	24.6	32.1	30.0
Level of Service	C	C	C	B	D	C	C	D	C	C	C	C
Approach Delay (s)	28.4			33.7			35.7			29.8		
Approach LOS	C			C			D			C		
Intersection Summary												
HCM Average Control Delay	31.8			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.74											
Actuated Cycle Length (s)	98.6			Sum of lost time (s)			15.0					
Intersection Capacity Utilization	77.4%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

2017 PM Peak 10/2/2009 No Build

Synchro 7 - Report
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HCM Unsignalized Intersection Capacity Analysis
8: Sorrento Rd & Gulf Beach Hwy (CR 292A)

2017 PM Peak
No Build

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↱	↰	↱	↰	↱
Volume (veh/h)	366	27	300	574	22	213
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	398	29	326	624	24	232
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			427		1689	412
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			427		1689	412
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			71		67	64
cM capacity (veh/h)			1132		73	640
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	
Volume Total	427	326	624	24	232	
Volume Left	0	326	0	24	0	
Volume Right	29	0	0	0	232	
cSH	1700	1132	1700	73	640	
Volume to Capacity	0.25	0.29	0.37	0.33	0.36	
Queue Length 95th (ft)	0	30	0	30	41	
Control Delay (s)	0.0	9.5	0.0	76.3	13.8	
Lane LOS	A			F	B	
Approach Delay (s)	0.0	3.2		19.6		
Approach LOS				C		
Intersection Summary						
Average Delay	5.0					
Intersection Capacity Utilization	50.9%			ICU Level of Service		
Analysis Period (min)	15			A		

2017 PM Peak 10/2/2009 No Build

Synchro 7 - Report
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HCM Unsignalized Intersection Capacity Analysis 13: Gulf Beach Hwy & Dog Track Rd

2017 PM Peak
No Build

	EBL	EBT	WBT	WBR	SBL	SBR
Movement	↖	↗	↖	↗	↖	↗
Lane Configurations	↖	↗	↖	↗	↖	↗
Volume (veh/h)	42	555	858	104	66	43
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	603	933	113	72	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1046				1627	933
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1046				1627	933
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				31	86
cM capacity (veh/h)	665				105	323
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	46	603	933	113	118	
Volume Left	46	0	0	0	72	
Volume Right	0	0	0	113	47	
cSH	665	1700	1700	1700	143	
Volume to Capacity	0.07	0.35	0.55	0.07	0.83	
Queue Length 95th (ft)	6	0	0	0	133	
Control Delay (s)	10.8	0.0	0.0	0.0	96.5	
Lane LOS	B				F	
Approach Delay (s)	0.8		0.0		96.5	
Approach LOS					F	
Intersection Summary						
Average Delay			6.6			
Intersection Capacity Utilization			58.1%		ICU Level of Service	B
Analysis Period (min)			15			

2017 PM Peak 10/2/2009 No Build

Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis 16: Gulf Beach Hwy & Fairfield Dr

2017 PM Peak
No Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Volume (vph)	155	525	6	11	968	59	11	12	5	81	12	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		5.0	5.0					5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Fit	1.00	1.00		1.00	0.99			0.98		1.00	0.85	
Fit Protected	0.95	1.00		0.95	1.00			0.98		0.96	1.00	
Satd. Flow (prot)	1770	1859		1770	1847			1785		1785	1583	
Fit Permitted	0.06	1.00		0.45	1.00			0.87		0.73	1.00	
Satd. Flow (perm)	114	1859		832	1847			1582		1364	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	571	7	12	1052	64	12	13	5	88	13	251
RTOR Reduction (vph)	0	0	0	0	2	0	0	4	0	0	0	220
Lane Group Flow (vph)	168	578	0	12	1114	0	0	26	0	0	101	31
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	78.1	78.1		61.3	61.3			12.6			12.6	12.6
Effective Green, g (s)	78.1	78.1		61.3	61.3			12.6			12.6	12.6
Actuated g/C Ratio	0.78	0.78		0.61	0.61			0.13			0.13	0.13
Clearance Time (s)	4.0	5.0		5.0	5.0			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	299	1442		506	1124			198			171	198
v/s Ratio Prot	c0.07	0.31			c0.60						c0.07	0.02
v/s Ratio Perm	0.36			0.01				0.02			c0.07	0.02
w/c Ratio	0.56	0.40		0.02	0.99			0.13			0.59	0.16
Uniform Delay, d1	28.5	3.7		7.8	19.4			39.2			41.6	39.3
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	2.4	0.2		0.0	24.7			0.3			5.4	0.4
Delay (s)	30.9	3.9		7.8	44.1			39.5			47.0	39.7
Level of Service	C	A		A	D			D			D	D
Approach Delay (s)		10.0			43.7			39.5			41.8	
Approach LOS		A			D			D			D	
Intersection Summary												
HCM Average Control Delay		32.2			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		100.7			Sum of lost time (s)			14.0				
Intersection Capacity Utilization		84.9%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

2017 PM Peak 10/2/2009 No Build

Synchro 7 - Report
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HCM Unsignalized Intersection Capacity Analysis

2017 PM Peak

21: Gulf Beach Hwy & Patton Dr

No Build

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
Volume (veh/h)	118	623	987	18	22	244
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	128	677	1073	20	24	265
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)					18	
Median type		None	TWLT			
Median storage (veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1092				2016	1083
vC1, stage 1 conf vol					1083	
vC2, stage 2 conf vol					934	
vCu, unblocked vol	1092				2016	1083
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	80				89	0
cM capacity (veh/h)	639				222	264

























Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	128	677	1092	289
Volume Left	128	0	0	24
Volume Right	0	0	20	265
cSH	639	1700	1700	288
Volume to Capacity	0.20	0.40	0.64	1.00
Queue Length 95th (ft)	19	0	0	262
Control Delay (s)	12.0	0.0	0.0	91.8
Lane LOS	B			F
Approach Delay (s)	1.9		0.0	91.8
Approach LOS				F

Intersection Summary

Average Delay	12.8			
Intersection Capacity Utilization		74.8%		ICU Level of Service
Analysis Period (min)		15		D

HCM Signalized Intersection Capacity Analysis
3: Sorrento Rd & Blue Angel Pkwy

2017 PM Peak
With Improvements












												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	288	323	49	93	404	86	131	512	69	169	353	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.18	1.00	1.00	0.46	1.00	1.00	0.47	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	338	1863	1583	861	1863	1583	884	3539	1583	397	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	313	351	53	101	439	93	142	557	75	184	384	314
RTOR Reduction (vph)	0	0	34	0	0	65	0	0	59	0	0	238
Lane Group Flow (vph)	313	351	19	101	439	28	142	557	16	184	384	76
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	49.1	35.2	35.2	38.5	29.6	29.6	32.1	21.5	21.5	36.9	23.9	23.9
Effective Green, g (s)	49.1	35.2	35.2	38.5	29.6	29.6	32.1	21.5	21.5	36.9	23.9	23.9
Actuated g/C Ratio	0.50	0.36	0.36	0.39	0.30	0.30	0.33	0.22	0.22	0.37	0.24	0.24
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	379	665	565	418	559	475	383	772	345	330	858	384
v/s Ratio Prot	c0.12	0.19		0.02	0.24		0.04	c0.16		c0.07	0.11	
v/s Ratio Perm	c0.29		0.01	0.07		0.02	0.08		0.01	0.14		0.05
v/c Ratio	0.83	0.53	0.03	0.24	0.79	0.06	0.37	0.72	0.05	0.56	0.45	0.20
Uniform Delay, d1	18.8	25.1	20.6	19.6	31.6	24.6	24.4	35.8	30.5	22.5	31.7	29.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.7	0.8	0.0	0.3	7.2	0.1	0.6	3.3	0.1	2.0	0.4	0.3
Delay (s)	32.5	25.9	20.7	19.9	38.7	24.6	25.0	39.1	30.5	24.6	32.1	30.0
Level of Service	C	C	C	B	D	C	C	D	C	C	C	C
Approach Delay (s)		28.4			33.7			35.7			29.8	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay	31.8			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.74											
Actuated Cycle Length (s)	98.6			Sum of lost time (s)			15.0					
Intersection Capacity Utilization	77.4%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

2017 PM Peak 10/2/2009 With Improvements

Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis
8: Sorrento Rd & Gulf Beach Hwy (CR 292A)

2017 PM Peak
With Improvements

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	366	27	300	574	22	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1846		1770	1863	1770	1583
Flt Permitted	1.00		0.49	1.00	0.95	1.00
Satd. Flow (perm)	1846		922	1863	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	398	29	326	624	24	232
RTOR Reduction (vph)	5	0	0	0	0	184
Lane Group Flow (vph)	422	0	326	624	24	48
Turn Type			Perm			Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Actuated Green, G (s)	19.8		19.8	19.8	7.2	7.2
Effective Green, g (s)	19.8		19.8	19.8	7.2	7.2
Actuated g/C Ratio	0.57		0.57	0.57	0.21	0.21
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1044		522	1054	364	326
v/s Ratio Prot	0.23			0.33	0.01	
v/s Ratio Perm			0.35			0.03
v/c Ratio	0.40		0.62	0.59	0.07	0.15
Uniform Delay, d1	4.3		5.1	5.0	11.2	11.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3		2.3	0.9	0.1	0.2
Delay (s)	4.5		7.4	5.9	11.3	11.6
Level of Service	A		A	A	B	B
Approach Delay (s)	4.5			6.4	11.6	
Approach LOS	A			A	B	
Intersection Summary						
HCM Average Control Delay			6.7	HCM Level of Service		A
HCM Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			35.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			50.9%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

2017 PM Peak 10/2/2009 With Improvements

Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis 13: Gulf Beach Hwy & Dog Track Rd

2017 PM Peak
With Improvements

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	42	555	858	104	66	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.95	
Flt Protected	0.95	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	1770	1863	1863	1583	1712	
Flt Permitted	0.17	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	321	1863	1863	1583	1712	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	603	933	113	72	47
RTOR Reduction (vph)	0	0	0	41	39	0
Lane Group Flow (vph)	46	603	933	72	80	0
Turn Type	Perm			Perm		
Protected Phases	2	2	6		4	
Permitted Phases	2			6		
Actuated Green, G (s)	28.1	28.1	28.1	28.1	7.8	
Effective Green, g (s)	28.1	28.1	28.1	28.1	7.8	
Actuated g/C Ratio	0.64	0.64	0.64	0.64	0.18	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	205	1192	1192	1013	304	
v/s Ratio Prot		0.32	c0.50		c0.05	
v/s Ratio Perm	0.14			0.05		
v/c Ratio	0.22	0.51	0.78	0.07	0.26	
Uniform Delay, d1	3.3	4.2	5.7	3.0	15.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.3	3.4	0.0	0.5	
Delay (s)	3.9	4.5	9.1	3.0	16.0	
Level of Service	A	A	A	A	B	
Approach Delay (s)		4.5	8.5		16.0	
Approach LOS		A	A		B	
Intersection Summary						
HCM Average Control Delay		7.5		HCM Level of Service		A
HCM Volume to Capacity ratio		0.67				
Actuated Cycle Length (s)		43.9		Sum of lost time (s)		8.0
Intersection Capacity Utilization		58.1%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						

2017 PM Peak 10/2/2009 With Improvements

Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis 16: Gulf Beach Hwy & Fairfield Dr

2017 PM Peak
With Improvements

Movement	EBL	EBT	EER	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	525	6	11	968	59	11	12	5	81	12	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		5.0	5.0			5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (prot)	1770	1859		1770	1847			1785			1785	1583
Flt Permitted	0.06	1.00		0.45	1.00			0.87			0.73	1.00
Satd. Flow (perm)	114	1859		832	1847			1582			1364	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	571	7	12	1052	64	12	13	5	88	13	251
RTOR Reduction (vph)	0	0	0	0	2	0	0	4	0	0	0	220
Lane Group Flow (vph)	168	578	0	12	1114	0	0	26	0	0	101	31
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	78.1	78.1		61.3	61.3			12.6			12.5	12.6
Effective Green, g (s)	78.1	78.1		61.3	61.3			12.6			12.5	12.6
Actuated g/C Ratio	0.78	0.78		0.61	0.61			0.13			0.13	0.13
Clearance Time (s)	4.0	5.0		5.0	5.0			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	299	1442		506	1124			198			171	198
v/s Ratio Prot	c0.07	0.31			c0.60						c0.07	0.02
v/s Ratio Perm	0.36			0.01				0.02			c0.07	0.02
v/c Ratio	0.56	0.40		0.02	0.99			0.13			0.59	0.16
Uniform Delay, d1	28.5	3.7		7.8	19.4			39.2			41.5	39.3
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	2.4	0.2		0.0	24.7			0.3			5.4	3.4
Delay (s)	30.9	3.9		7.8	44.1			39.5			47.0	39.7
Level of Service	C	A		A	D			D			D	D
Approach Delay (s)		10.0			43.7			39.5			41.3	
Approach LOS		A			D			D			D	
Intersection Summary												
HCM Average Control Delay		32.2										C
HCM Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		100.7									14.0	
Intersection Capacity Utilization		84.9%										E
Analysis Period (min)		15										
c Critical Lane Group												












2017 PM Peak 10/2/2009 With Improvements

Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis

21: Gulf Beach Hwy & Patton Dr

2017 PM Peak
With Improvements

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	118	623	987	18	22	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	1858		1770	1583
Flt Permitted	0.13	1.00	1.00		0.95	1.00
Satd. Flow (perm)	243	1863	1858		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	128	677	1073	20	24	265
RTOR Reduction (vph)	0	0	1	0	0	121
Lane Group Flow (vph)	128	677	1092	0	24	144
Turn Type	Perm				Perm	
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	47.8	47.8	47.8		10.9	10.9
Effective Green, g (s)	47.8	47.8	47.8		10.9	10.9
Actuated g/C Ratio	0.72	0.72	0.72		0.16	0.16
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	174	1335	1332		289	259
v/s Ratio Prot		0.36	0.59		0.01	
v/s Ratio Perm	0.53					0.09
v/c Ratio	0.74	0.51	0.82		0.08	0.55
Uniform Delay, d1	5.7	4.2	6.5		23.7	25.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	14.9	0.3	4.1		0.1	2.6
Delay (s)	20.6	4.5	10.6		23.8	28.2
Level of Service	C	A	B		C	C
Approach Delay (s)		7.1	10.6		27.9	
Approach LOS		A	B		C	
Intersection Summary						
HCM Average Control Delay			11.6		HCM Level of Service	B
HCM Volume to Capacity ratio			0.77			
Actuated Cycle Length (s)			66.7		Sum of lost time (s)	8.0
Intersection Capacity Utilization			74.8%		ICU Level of Service	D
Analysis Period (min)			15			
Critical Lane Group						

Queuing and Blocking Report
Baseline

2017 PM Peak
10/2/2009

Intersection: 3: Sorrento Rd & Blue Angel Pkwy

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	520	887	380	90	535	44	138	299	312	89	163	138
Average Queue (ft)	485	705	13	42	248	1	78	138	165	29	85	89
95th Queue (ft)	622	1155	125	87	388	14	127	230	263	62	154	138
Link Distance (ft)		849			1018			923	923			864
Upstream Blk Time (%)		26										
Queuing Penalty (veh)		0										
Storage Bay Dist (ft)	470		330	545		320	565			495	555	
Storage Blk Time (%)	58	3			2							
Queuing Penalty (veh)	216	10			3							

Intersection: 3: Sorrento Rd & Blue Angel Pkwy

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	174	246
Average Queue (ft)	106	96
95th Queue (ft)	151	193
Link Distance (ft)	864	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		510
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Sorrento Rd & Gulf Beach Hwy (CR 292A)

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	161	53	118
Average Queue (ft)	54	20	54
95th Queue (ft)	107	46	88
Link Distance (ft)		1874	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	220	320	
Storage Blk Time (%)			
Queuing Penalty (veh)			

2017 PM Peak

SimTraffic Report
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Queuing and Blocking Report
Baseline

2017 PM Peak
10/2/2009

Intersection: 13: Gulf Beach Hwy & Dog Track Rd

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	51	132
Average Queue (ft)	17	44
95th Queue (ft)	45	93
Link Distance (ft)		1444
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 16: Gulf Beach Hwy & Fairfield Dr

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	221	152	190	1424	113	117	202
Average Queue (ft)	74	73	16	1234	35	70	111
95th Queue (ft)	140	135	74	1549	82	114	174
Link Distance (ft)		1223		1361	1724		1518
Upstream Blk Time (%)				14			
Queuing Penalty (veh)				0			
Storage Bay Dist (ft)	415		140			275	
Storage Blk Time (%)				39			
Queuing Penalty (veh)				4			

Intersection: 21: Gulf Beach Hwy & Patton Dr

Movement	EB	WB	SB	SB
Directions Served	L	TR	L	R
Maximum Queue (ft)	138	22	630	510
Average Queue (ft)	57	1	217	398
95th Queue (ft)	100	7	621	609
Link Distance (ft)		1899	2066	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100			460
Storage Blk Time (%)	2		0	31
Queuing Penalty (veh)	15		1	7

Network Summary

Network wide Queuing Penalty: 257

2017 PM Peak

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Queuing and Blocking Report

2017 PM Peak
With Improvements

Intersection: 3: Sorrento Rd & Blue Angel Pkwy

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	520	887	380	90	535	44	138	299	312	89	163	138
Average Queue (ft)	485	705	13	42	248	1	78	138	165	29	85	89
95th Queue (ft)	622	1155	125	87	388	14	127	230	283	62	154	138
Link Distance (ft)		849			1018			923	923			864
Upstream Blk Time (%)		26										
Queuing Penalty (veh)		0										
Storage Bay Dist (ft)	470		330	545		320	565			495	555	
Storage Blk Time (%)	58	3			2							
Queuing Penalty (veh)	216	10			3							

Intersection: 3: Sorrento Rd & Blue Angel Pkwy

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	174	246
Average Queue (ft)	106	96
95th Queue (ft)	151	193
Link Distance (ft)	864	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		510
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Sorrento Rd & Gulf Beach Hwy (CR 292A)

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (ft)	97	183	177	53	116
Average Queue (ft)	55	93	58	14	48
95th Queue (ft)	99	149	115	41	79
Link Distance (ft)	1322		1378		1874
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		220		320	
Storage Blk Time (%)					
Queuing Penalty (veh)					

2017 PM Peak

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Queuing and Blocking Report

2017 PM Peak
With Improvements

Intersection: 13: Gulf Beach Hwy & Dog Track Rd

Movement	EB	EB	WB	WB	SB
Directions Served	L	T	T	R	LR
Maximum Queue (ft)	53	139	269	55	106
Average Queue (ft)	24	77	155	26	33
95th Queue (ft)	56	121	254	49	67
Link Distance (ft)		1112	1178		1444
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150			315	
Storage Blk Time (%)		0			
Queuing Penalty (veh)		0			

Intersection: 16: Gulf Beach Hwy & Fairfield Dr

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	221	152	190	1424	113	117	202
Average Queue (ft)	74	73	16	1234	35	70	111
95th Queue (ft)	140	135	74	1549	82	114	174
Link Distance (ft)		1223		1361	1724		1518
Upstream Blk Time (%)				14			
Queuing Penalty (veh)				0			
Storage Bay Dist (ft)	415		140			275	
Storage Blk Time (%)				39			
Queuing Penalty (veh)				4			

Intersection: 21: Gulf Beach Hwy & Patton Dr

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	149	523	290	51	203
Average Queue (ft)	82	121	157	15	117
95th Queue (ft)	136	303	278	41	190
Link Distance (ft)		1939	1899	2066	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				460
Storage Blk Time (%)	11	3			
Queuing Penalty (veh)	70	4			

Network Summary

Network wide Queuing Penalty: 307

2017 PM Peak

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HCM Signalized Intersection Capacity Analysis 3: Gulf Beach Hwy & N Navy Blvd

Optimized Signal Timing Timing Plan: AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SEL	SBT	SBR
Movement	←	→	↘	←	→	↘	←	→	↘	←	→	↘
Lane Configurations	↔	↔		↔	↔	↔	↔	↔		↔	↔	
Volume (vph)	185	712	59	681	248	113	21	349	0	115	783	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95		0.97	1.00	1.00	1.00	0.95		1.00	0.95	
Flt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3499		3433	1863	1583	1770	3539		1770	3518	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.21	1.00		0.34	1.00	
Satd. Flow (perm)	3433	3499		3433	1863	1583	386	3539		637	3518	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	201	774	64	740	270	123	23	379	0	125	851	35
RTOR Reduction (vph)	0	7	0	0	0	66	0	0	0	0	3	0
Lane Group Flow (vph)	201	831	0	740	270	57	23	379	0	125	883	0
Turn Type	Prot			Prot	pm+ov	pm+pt				pm+pt		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8	2					
Actuated Green, G (s)	9.2	21.2		20.0	32.0	39.8	21.9	19.3		31.6	24.5	
Effective Green, g (s)	9.2	21.2		20.0	32.0	39.8	21.9	19.3		31.6	24.5	
Actuated g/C Ratio	0.11	0.25		0.23	0.37	0.46	0.25	0.22		0.37	0.28	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	366	860		796	691	813	140	791		336	999	
v/s Ratio Prot	0.06	c0.24		c0.22	0.14	0.01	0.00	0.11		c0.03	c0.25	
v/s Ratio Perm						0.03	0.04			0.10		
v/c Ratio	0.55	0.97		0.93	0.39	0.07	0.16	0.48		0.37	0.88	
Uniform Delay, d1	36.6	32.2		32.5	20.0	12.9	25.2	29.1		19.1	29.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	22.6		17.0	0.4	0.0	0.6	0.5		0.7	9.4	
Delay (s)	38.3	54.8		49.4	20.3	13.0	25.7	29.6		19.8	38.9	
Level of Service	D	D		D	C	B	C	C		B	D	
Approach Delay (s)		51.6			38.5		29.4				36.6	
Approach LOS		D			D		C				D	
Intersection Summary												
HCM Average Control Delay		40.7										
HCM Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		86.3										
Intersection Capacity Utilization		82.0%										
Analysis Period (min)		15										
c Critical Lane Group												

Optimized Signal Timing 4/23/2010 Baseline

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HCM Signalized Intersection Capacity Analysis 3: Gulf Beach Hwy & N Navy Blvd

Optimized Signal Timing Timing Plan: MID Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	←	→	↘	←	→	↘	←	→	↘	←	→	↘
Lane Configurations	↔	↔		↔	↔	↔	↔	↔		↔	↔	
Volume (vph)	147	376	40	204	301	238	44	588	3	185	516	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95		0.97	1.00	1.00	1.00	0.95		1.00	0.95	
Flt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3489		3433	1863	1583	1770	3537		1770	3444	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.32	1.00		0.21	1.00	
Satd. Flow (perm)	3433	3489		3433	1863	1583	601	3537		392	3444	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	409	43	222	327	259	48	639	3	201	561	123
RTOR Reduction (vph)	0	12	0	0	0	45	0	1	0	0	27	0
Lane Group Flow (vph)	160	440	0	222	327	214	48	641	0	201	657	0
Turn Type	Prot			Prot	pm+ov	pm+pt				pm+pt		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8	2					
Actuated Green, G (s)	5.4	15.0		7.1	16.7	24.1	21.0	17.1		28.0	20.6	
Effective Green, g (s)	5.4	15.0		7.1	16.7	24.1	21.0	17.1		28.0	20.6	
Actuated g/C Ratio	0.08	0.23		0.11	0.26	0.37	0.33	0.26		0.43	0.32	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	810		377	482	701	266	936		328	1098	
v/s Ratio Prot	0.05	0.13		c0.06	c0.18	0.03	0.01	0.18		c0.07	0.19	
v/s Ratio Perm						0.10	0.05			c0.20		
v/c Ratio	0.56	0.54		0.59	0.68	0.31	0.18	0.69		0.61	0.60	
Uniform Delay, d1	20.5	21.0		27.4	21.5	14.3	15.2	21.3		12.7	10.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.7		2.3	3.8	0.2	0.3	2.1		3.4	0.9	
Delay (s)	30.8	22.5		29.7	25.3	14.6	15.5	23.4		16.1	19.4	
Level of Service	C	C		C	C	B	B	C		B	B	
Approach Delay (s)		24.7			23.1		22.9				18.7	
Approach LOS		C			C		C				B	
Intersection Summary												
HCM Average Control Delay		22.1										
HCM Volume to Capacity ratio		0.63										
Actuated Cycle Length (s)		64.6										
Intersection Capacity Utilization		63.3%										
Analysis Period (min)		15										
c Critical Lane Group												

Optimized Signal Timing 4/23/2010 Baseline

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HCM Signalized Intersection Capacity Analysis 3: Gulf Beach Hwy & N Navy Blvd

Optimized Signal Timing Timing Plan: PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	145	358	20	174	420	155	106	1074	2	205	266	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95		0.97	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3511		3433	1863	1583	1770	3538		1770	3298	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.42	1.00		0.11	1.00	
Satd. Flow (perm)	3433	3511		3433	1863	1583	775	3538		208	3298	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	389	22	189	457	168	115	1167	2	223	289	241
RTOR Reduction (vph)	0	5	0	0	0	18	0	0	0	0	145	0
Lane Group Flow (vph)	158	406	0	189	457	150	115	1169	0	223	385	0
Turn Type	Prot			Prot		pm+ov	pm+pt			pm+pt		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	7.4	21.4		9.0	23.0	31.5	39.1	33.2		44.3	35.8	
Effective Green, g (s)	7.4	21.4		9.0	23.0	31.5	39.1	33.2		44.3	35.8	
Actuated g/C Ratio	0.08	0.24		0.10	0.26	0.35	0.43	0.37		0.49	0.40	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	282	834		343	476	632	401	1304		250	1310	
v/s Ratio Prot	0.05	0.12		c0.06	c0.25	0.02	0.02	0.33		c0.08	0.12	
v/s Ratio Perm						0.07	0.11			c0.35		
v/c Ratio	0.56	0.49		0.55	0.96	0.24	0.29	0.90		0.89	0.29	
Uniform Delay, d1	39.8	29.6		38.6	33.1	20.8	15.5	26.8		20.3	18.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	0.5		1.9	31.1	0.2	0.4	8.4		30.2	0.1	
Delay (s)	42.3	30.1		40.5	64.2	21.0	15.9	35.2		50.5	18.6	
Level of Service	D	C		D	E	C	B	D		D	B	
Approach Delay (s)		33.5			49.8			33.5			28.1	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM Average Control Delay		36.2										
HCM Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		90.1						13.5				
Intersection Capacity Utilization		84.0%										
Analysis Period (min)		15										
c Critical Lane Group												

Optimized Signal Timing 4/23/2010 Baseline

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HCM Signalized Intersection Capacity Analysis 3: Gulf Beach Hwy & N Navy Blvd

Revised Geometry/Optimized Signal Timing Timing Plan: AM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	185	712	59	681	248	113	21	349	0	115	783	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	1863	1583	1770	3539		1770	3518	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.21	1.00		0.35	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	1863	1583	382	3539		644	3518	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	201	774	64	740	270	123	23	379	0	125	851	35
RTOR Reduction (vph)	0	0	49	0	0	74	0	0	0	0	3	0
Lane Group Flow (vph)	201	774	15	740	270	49	23	379	0	125	883	0
Turn Type	Prot			Perm		Prot	pm+ov	pm+pt		pm+pt		
Protected Phases	7	4			3	8	1	5	2	1	6	
Permitted Phases				4			8	2		6		
Actuated Green, G (s)	14.1	20.6	20.6	20.3	26.8	34.1	22.1	19.5		31.3	24.2	
Effective Green, g (s)	14.1	20.6	20.6	20.3	26.8	34.1	22.1	19.5		31.3	24.2	
Actuated g/C Ratio	0.16	0.24	0.24	0.24	0.31	0.40	0.26	0.23		0.37	0.28	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	291	851	381	813	583	713	141	805		331	993	
v/s Ratio Prot	0.11	c0.22		c0.22	0.14	0.01	0.00	0.11		c0.03	c0.25	
v/s Ratio Perm			0.01			0.03	0.04			0.11		
v/c Ratio	0.69	0.91	0.04	0.91	0.46	0.07	0.16	0.47		0.38	0.89	
Uniform Delay, d1	33.7	31.6	25.0	31.8	23.7	16.0	24.8	28.6		19.0	29.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.9	13.4	0.0	14.2	0.6	0.0	0.5	0.4		0.7	9.8	
Delay (s)	40.6	45.1	25.0	46.0	24.3	16.0	25.4	29.1		19.8	39.3	
Level of Service	D	D	C	D	C	B	C	C		B	D	
Approach Delay (s)		43.0			37.6			28.9			36.9	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM Average Control Delay		38.0										
HCM Volume to Capacity ratio		0.89										
Actuated Cycle Length (s)		85.7						18.0				
Intersection Capacity Utilization		80.1%										
Analysis Period (min)		15										
c Critical Lane Group												

Revised Geometry/Optimized Signal Timing 4/23/2010 Baseline

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HCM Signalized Intersection Capacity Analysis Optimized Signal Timing/Modified Geometry
3: Gulf Beach Hwy & N Navy Blvd Timing Plan: Mid Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Volume (vph)	147	376	40	204	301	238	44	588	3	185	516	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	1863	1583	1770	3537		1770	3444	
Flt Permitted	0.40	1.00	1.00	0.95	1.00	1.00	0.32	1.00		0.22	1.00	
Satd. Flow (perm)	745	3539	1583	3433	1863	1583	600	3537		410	3444	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	409	43	222	327	259	48	639	3	201	561	123
RTOR Reduction (vph)	0	0	34	0	0	96	0	1	0	0	26	0
Lane Group Flow (vph)	160	409	9	222	327	163	48	641	0	201	658	0
Turn Type	pm+pt		Perm	Prot		pm+ov	pm+pt			pm+pt		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4		4			8	2			6		
Actuated Green, G (s)	19.4	13.6	13.6	8.2	16.0	23.3	21.7	17.7		28.3	21.0	
Effective Green, g (s)	19.4	13.6	13.6	8.2	16.0	23.3	21.7	17.7		28.3	21.0	
Actuated g/C Ratio	0.30	0.21	0.21	0.13	0.25	0.36	0.33	0.27		0.44	0.32	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	315	743	332	434	460	679	273	966		332	1116	
v/s Ratio Prot	0.05	0.12		c0.06	c0.18	0.03	0.01	0.18		c0.07	0.19	
v/s Ratio Perm	0.11		0.01			0.08	0.05			c0.20		
v/c Ratio	0.51	0.55	0.03	0.51	0.71	0.24	0.18	0.66		0.61	0.59	
Uniform Delay, d1	17.6	22.9	20.3	26.4	22.3	14.5	14.8	20.9		12.6	18.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.9	0.0	1.0	5.1	0.2	0.3	1.7		3.1	0.8	
Delay (s)	18.9	23.8	20.4	27.4	27.4	14.7	15.1	22.6		15.7	19.1	
Level of Service	B	C	C	C	C	B	B	C		B	B	
Approach Delay (s)		22.3			23.4		22.1				18.3	
Approach LOS		C			C		C				B	
Intersection Summary												
HCM Average Control Delay		21.4										
HCM Volume to Capacity ratio		0.63										
Actuated Cycle Length (s)		64.8						13.5				
Intersection Capacity Utilization		65.6%										
Analysis Period (min)		15										
c Critical Lane Group												

Optimized Signal Timing/Modified Geometry 4/23/2010 Baseline

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HCM Signalized Intersection Capacity Analysis Optimized Signal Timing/Modified Geometry
3: Gulf Beach Hwy & N Navy Blvd Timing Plan: PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Volume (vph)	145	358	20	174	420	155	106	1074	2	205	266	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	1863	1583	1770	3538		1770	3298	
Flt Permitted	0.17	1.00	1.00	0.95	1.00	1.00	0.42	1.00		0.12	1.00	
Satd. Flow (perm)	320	3539	1583	3433	1863	1583	783	3538		219	3298	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	389	22	189	457	168	115	1167	2	223	289	241
RTOR Reduction (vph)	0	0	16	0	0	125	0	0	0	0	150	0
Lane Group Flow (vph)	158	389	6	189	457	43	115	1169	0	223	380	0
Turn Type	pm+pt		Perm	Prot		Perm	pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2			6		
Actuated Green, G (s)	32.4	23.3	23.3	9.0	23.2	23.2	36.5	30.5		43.5	34.0	
Effective Green, g (s)	32.4	23.3	23.3	9.0	23.2	23.2	36.5	30.5		43.5	34.0	
Actuated g/C Ratio	0.36	0.26	0.26	0.10	0.26	0.26	0.40	0.34		0.48	0.38	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	261	913	408	342	479	407	382	1195		269	1242	
v/s Ratio Prot	c0.06	0.11		0.06	c0.25		0.02	c0.33		c0.39	0.12	
v/s Ratio Perm	0.16		0.00			0.03	0.10			0.31		
v/c Ratio	0.61	0.43	0.01	0.55	0.95	0.11	0.30	0.98		0.33	0.31	
Uniform Delay, d1	22.5	27.9	24.9	38.7	33.0	25.6	17.2	29.6		19.9	19.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.9	0.3	0.0	1.9	29.6	0.1	0.4	20.7		18.6	0.1	
Delay (s)	26.4	28.2	25.0	40.7	62.6	25.7	17.6	50.3		38.5	20.0	
Level of Service	C	C	C	D	E	C	B	D		D	B	
Approach Delay (s)		27.6			49.9		47.3				25.5	
Approach LOS		C			D		D				C	
Intersection Summary												
HCM Average Control Delay		39.8										
HCM Volume to Capacity ratio		0.97										
Actuated Cycle Length (s)		90.3						22.5				
Intersection Capacity Utilization		86.2%										
Analysis Period (min)		15										
c Critical Lane Group												

Optimized Signal Timing/Modified Geometry 4/23/2010 Baseline

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HCM Signalized Intersection Capacity Analysis 3: Gulf Beach Hwy & N Navy Blvd

Opt Sig Timing Rev Geo- 2 WBT 1 EBL
Timing Plan: AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↱		↰↱	↰↱	↰	↰	↰↱		↰	↰↱	↰
Volume (vph)	185	712	59	661	248	113	21	349	0	115	763	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3499		3433	3539	1583	1770	3539		1770	3518	
Flt Permitted	0.59	1.00		0.95	1.00	1.00	0.21	1.00		0.34	1.00	
Satd. Flow (perm)	1091	3499		3433	3539	1583	386	3539		637	3518	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	201	774	64	740	270	123	23	379	0	125	851	35
RTOR Reduction (vph)	0	7	0	0	0	67	0	0	0	0	3	0
Lane Group Flow (vph)	201	831	0	740	270	56	23	379	0	125	883	0
Turn Type	pm+pt			Prot		pm+ov	pm+pt			pm+pt		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4					8	2			6		
Actuated Green, G (s)	30.6	21.2		20.0	31.8	39.6	21.9	19.3		31.6	24.5	
Effective Green, g (s)	30.6	21.2		20.0	31.8	39.6	21.9	19.3		31.6	24.5	
Actuated g/C Ratio	0.35	0.25		0.23	0.37	0.46	0.25	0.22		0.37	0.28	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	461	860		796	1304	809	140	791		336	999	
v/s Ratio Prot	0.05	c0.24		c0.22	0.08	0.01	0.00	0.11		c0.03	c0.25	
v/s Ratio Perm	0.11					0.03	0.04			0.10		
v/c Ratio	0.44	0.97		0.93	0.21	0.07	0.16	0.48		0.37	0.88	
Uniform Delay, d1	20.3	32.2		32.5	18.6	13.1	25.2	29.1		19.1	29.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	22.6		17.0	0.1	0.0	0.6	0.5		0.7	9.4	
Delay (s)	20.9	54.8		49.4	18.7	13.1	25.7	29.6		19.8	38.9	
Level of Service	C	D		D	B	B	C	C		B	D	
Approach Delay (s)		48.3			38.2		29.4				36.6	
Approach LOS		D			D		C				D	
Intersection Summary												
HCM Average Control Delay		39.7										
HCM Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		86.3						18.0				
Intersection Capacity Utilization		82.0%										
Analysis Period (min)		15										
c Critical Lane Group												

Opt Sig Timing Rev Geo- 2 WBT 1 EBL 4/23/2010 Baseline

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HCM Signalized Intersection Capacity Analysis 3: Gulf Beach Hwy & N Navy Blvd

Opt Sig Timing Rev Geo- 2 WBT 1 EBL
Timing Plan: MID Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↱		↰↱	↰↱	↰	↰	↰↱		↰	↰↱	↰
Volume (vph)	147	376	40	204	301	238	44	588	3	185	516	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3489		3433	3539	1583	1770	3537		1770	3444	
Flt Permitted	0.55	1.00		0.95	1.00	1.00	0.33	1.00		0.22	1.00	
Satd. Flow (perm)	1032	3489		3433	3539	1583	615	3537		401	3444	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	409	43	222	327	259	48	639	3	201	561	123
RTOR Reduction (vph)	0	13	0	0	0	108	0	1	0	0	26	0
Lane Group Flow (vph)	160	439	0	222	327	151	48	641	0	201	658	0
Turn Type	pm+pt			Prot		pm+ov	pm+pt			pm+pt		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4					8	2			6		
Actuated Green, G (s)	19.1	13.7		7.1	15.4	22.8	20.9	17.0		27.9	20.5	
Effective Green, g (s)	19.1	13.7		7.1	15.4	22.8	20.9	17.0		27.9	20.5	
Actuated g/C Ratio	0.30	0.22		0.11	0.24	0.36	0.33	0.27		0.44	0.32	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	375	756		386	862	684	275	951		337	1117	
v/s Ratio Prot	0.04	c0.13		c0.06	0.09	0.03	0.01	0.18		c0.07	0.19	
v/s Ratio Perm	0.09					0.07	0.05			c0.19		
v/c Ratio	0.43	0.58		0.58	0.38	0.22	0.17	0.67		0.60	0.59	
Uniform Delay, d1	16.9	22.2		26.6	19.9	14.0	14.6	20.6		12.1	17.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	1.1		2.1	0.3	0.2	0.3	1.9		2.8	0.8	
Delay (s)	17.7	23.3		28.7	20.2	14.2	14.9	22.5		15.0	18.6	
Level of Service	B	C		C	C	B	B	C		B	B	
Approach Delay (s)		21.9			20.6		22.0				17.8	
Approach LOS		C			C		C				B	
Intersection Summary												
HCM Average Control Delay		20.4										
HCM Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		63.2						18.0				
Intersection Capacity Utilization		59.1%										
Analysis Period (min)		15										
c Critical Lane Group												

Opt Sig Timing Rev Geo- 2 WBT 1 EBL 4/23/2010 Baseline

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Opt Sig Timing Rev Geo-2 WBT 1 CDL
Timing Plan: PM Peak

Opt Sig Timing Rev Geo- 2 WBT 1 EBL 4/23/2010 Baseline

Navy Boulevard at SR 292 – Intersection Analysis

Addendum to the Gulf Beach Highway/Sorrento Road (SR 292) Corridor Management Plan

Prepared for:



Prepared by:



September 2010

Existing Traffic Conditions

The intersection of SR 292 and Navy Boulevard is a four-leg signalized intersection. The north approach consists of an exclusive left turn lane and two through lanes with right turns being made from the outer most lane. The left turns are served by protected/permitted phasing. The east approach consists of dual left turn lanes, a single through lane and an exclusive right turn lane. The south approach has a single left turn lane and two through lanes. The majority of right turn traffic on this approach uses Barrancas Avenue to access SR 292. The left turn movement on this approach is served by protected/permitted signal phasing. The west approach of the intersection consists of dual left turn lanes, two through lanes with right turns being made from the outer most through lane.

As part of the operational analysis, intersection turning movement counts were collected at this intersection on April 7, 2010 from 6am to 9am, 11am to 1pm, and 3pm to 6pm. From these counts it was determined that the morning (AM) peak hour was from 7:15am to 8:15am, the midday peak hour was from noon to 1pm, and the evening (PM) peak hour was from 3:30pm to 4:30pm. These traffic counts are included in Appendix A of this study.

Corresponding to the peak periods, signal timing data was collected. This timing data was as part of the existing conditions analysis. Signal timing data can be found in Appendix B of this study.

Level of Service

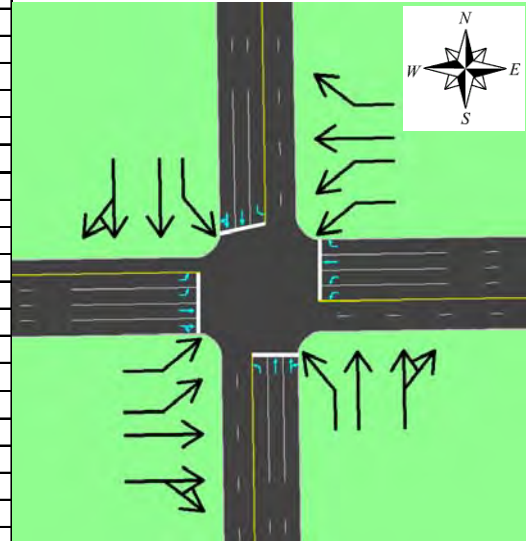
Level of Service (LOS) ratings are qualitative measurements that describe operational conditions on roadways indicating the level of driver satisfaction and roadway congestion. These ratings range from LOS A (the best) to LOS F (the worst). For this study Synchro plus SimTraffic 7 was utilized to determine intersection level of service as

well as to optimize the signal timing. Synchro utilizes the same methodology as the Highway Capacity Manual.

LOS analyses were conducted for the existing conditions and three other scenarios. Table 1 provides the results of the existing condition analysis. The intersection operates at a LOS D or better in all three analysis periods. However, during the AM peak hour the level of service for the westbound left turn movement is F with an average delay of 126.8 seconds. This delay results in the entire approach operating at an LOS F with 90.2 seconds of delay. During the PM peak this same movement and approach operates at a LOS E.

Table 1 – Existing Conditions LOS

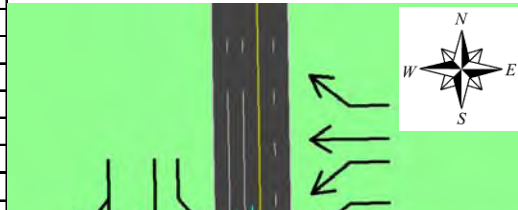
AM PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	43.2	42.5	126.8	23.7	15.9	25.2	28.4	19.5	31.9
	LOS	D	D	F	C	B	C	C	B	C
	Approach Delay (Seconds)	42.6		90.2			28.2		30.4	
	Approach LOS	D		F			C		C	
	Intersection Delay (Seconds)	52.6								
Intersection LOS	D									
MIDDAY PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	36.6	30.7	36.0	35.0	18.3	19.3	28.4	16.0	22.0
	LOS	D	C	D	D	B	B	C	B	C
	Approach Delay (Seconds)	32.2		29.9			27.8		20.6	
	Approach LOS	C		C			C		C	
	Intersection Delay (Seconds)	27.2								
Intersection LOS	C									
PM PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
		EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	65.9	43.3	67.2	64.4	28.1	23.0	46.1	61.3	26.8
	LOS	E	D	E	E	C	C	D	E	C
	Approach Delay (Seconds)	49.6		57.5			44.0		37.0	
	Approach LOS	D		E			D		D	
	Intersection Delay (Seconds)	46.6								
Intersection LOS	D									



The second scenario analyzed involved using the existing intersection geometry with Synchro optimized signal timings. Optimizing the signal timing provided improved LOS during all three analysis periods. It eliminated the failing movement and approach in the AM peak hour. The only movement left operating at a LOS E was the westbound through movement during the PM peak hour. All approaches operate at LOS D or better. Table 2 provides the details of the operational analysis for this scenario.

Table 2 – Optimized Signal Timings LOS

		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
		EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
AM PEAK	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	38.3	51.6	49.4	20.3	13.0	25.7	29.6	19.8	38.9
	LOS	D	D	D	C	B	C	C	B	D
	Approach Delay (Seconds)	51.6		38.5			29.4		36.6	
	Approach LOS	D		D			C		D	
	Intersection Delay (Seconds)	40.7								
	Intersection LOS	D								
MIDDAY PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	30.8	22.5	29.7	25.3	14.6	15.5	23.4	16.1	19.4
	LOS	C	C	C	C	B	B	C	B	B
	Approach Delay (Seconds)	24.7		23.1			22.9		18.7	
	Approach LOS	C		C			C		B	
	Intersection Delay (Seconds)	22.1								
	Intersection LOS	C								
PM PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	42.3	30.1	40.5	64.2	21.0	15.9	35.2	50.5	18.6
	LOS	D	C	D	E	C	B	D	D	B
	Approach Delay (Seconds)	33.5		49.8			33.5		28.1	
	Approach LOS	C		D			C		C	
	Intersection Delay (Seconds)	36.2								
	Intersection LOS	D								

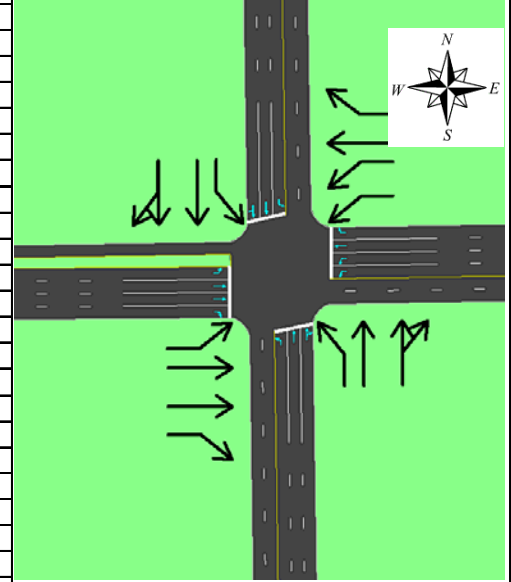


The third analysis scenario examined improvements to the eastbound approach of the intersection. This approach currently consists of dual left turn lanes and two through lanes with the outermost through lane facilitating right turns. This approach was modified to a single left turn lane, two through lanes and an exclusive right turn lane. Synchro optimized signal timings were used for this analysis. This scenario provided LOS D or better for all movements and approaches to the intersection except the westbound through movement during the PM peak hour. Table 3 provides the analysis results.

Table 3 – Eastbound Lane Improvements LOS

AM PEAK		Gulf Beach Hwy			Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	40.6	45.1	25.0	46.0	24.3	16.0	25.4	29.1	19.8	39.3
	LOS	D	D	C	D	C	B	C	C	B	D
	Approach Delay (Seconds)	43.0			37.6			28.9		36.9	
	Approach LOS	D			D			C		D	
	Intersection Delay (Seconds)	38.0									
Intersection LOS	D										
MIDDAY PEAK		Gulf Beach Hwy			Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	18.9	23.8	20.4	27.4	27.4	14.7	15.1	22.6	15.7	19.1
	LOS	B	C	C	C	C	B	B	C	B	B
	Approach Delay (Seconds)	22.3			23.4			22.1		18.3	
	Approach LOS	C			C			C		B	
	Intersection Delay (Seconds)	21.4									
Intersection LOS	C										
PM PEAK		Gulf Beach Hwy			Gulf Beach Hwy			Navy Blvd		Navy Blvd	
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	26.4	28.2	25.0	40.7	62.6	25.7	17.6	50.3	38.5	20.0
	LOS	C	C	C	D	E	C	B	D	D	B
	Approach Delay (Seconds)	27.6			49.9			47.3		25.5	
	Approach LOS	C			D			D		C	
	Intersection Delay (Seconds)	39.8									
Intersection LOS	D										

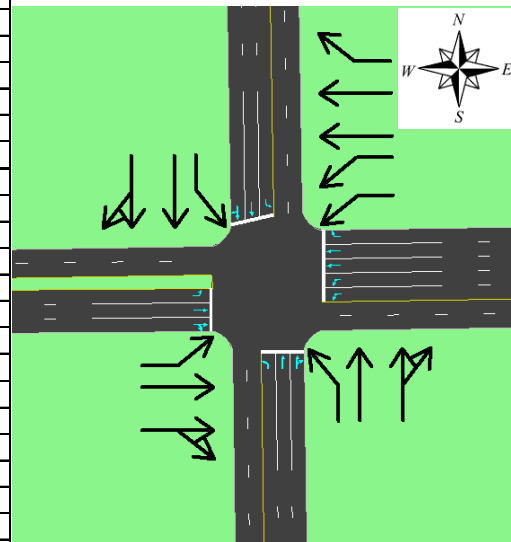
The diagram illustrates a four-way intersection. A vertical road runs through the center, and a horizontal road crosses it. Traffic flow is indicated by black arrows: on the vertical road, arrows point north and south; on the horizontal road, arrows point east and west. A compass rose in the top right corner shows North (N), South (S), East (E), and West (W). The intersection area is highlighted in light blue, while the surrounding areas are light green. The roads are depicted with white dashed lines for lanes and solid lines for the edges.



The final scenario analyzed improvements to the westbound leg of the intersection. This leg currently consists of dual left turn lanes, a single through lane, and a dedicated right turn lane. This approach was modified to accommodate an additional westbound through lane. In addition the dual eastbound left turn lane was reduced to a single lane. These modifications resulted in all movements and approaches operating with a LOS D or better in all three analysis periods. The results of this analysis are detailed in Table 4.

Table 4 – Westbound Lane Improvements LOS

AM PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	20.9	54.8	49.4	18.7	13.1	25.7	29.6	19.8	38.9
	LOS	C	D	D	B	B	C	C	B	D
	Approach Delay (Seconds)	48.3		38.2			29.4		36.6	
	Approach LOS	D		D			C		D	
	Intersection Delay (Seconds)	39.7								
Intersection LOS	D									
MIDDAY PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	17.7	23.3	28.7	20.2	14.2	14.9	22.5	15.0	18.6
	LOS	B	C	C	C	B	B	C	B	B
	Approach Delay (Seconds)	21.9		20.6			22.0		17.8	
	Approach LOS	C		C			C		B	
	Intersection Delay (Seconds)	20.4								
Intersection LOS	C									
PM PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	31.4	35.7	41.6	38.6	22.9	13.2	26.3	26.5	14.0
	LOS	C	D	D	D	C	B	C	C	B
	Approach Delay (Seconds)	34.5		36.0			25.2		17.7	
	Approach LOS	C		D			C		B	
	Intersection Delay (Seconds)	27.7								
Intersection LOS	C									



2010 Analysis Results

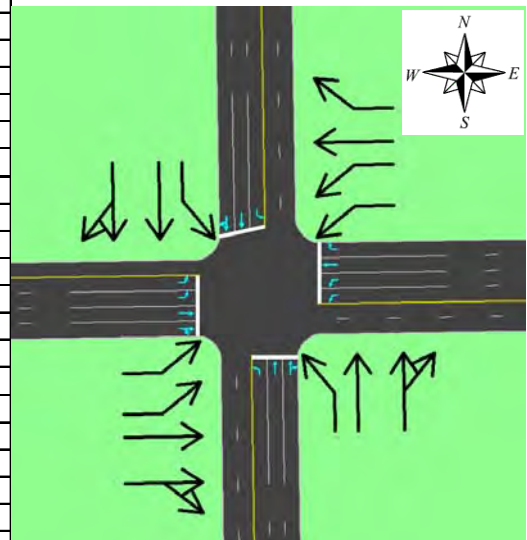
Each of the three alternatives resulted in improved traffic operations at the intersection. The most basic approach would be to retime the traffic signal. This would not require any construction. However, further study may be required to determine the impacts of this signal revision on the operations of adjacent traffic signals. If these signals are part of a coordinated system the timing may have to be adjusted on those as well. The remaining options each require construction and possible right of way acquisition. These costs can be significant and provide only marginal improvement over simply retiming the existing traffic signal.

2017 Alternative Analysis

LOS analyses were conducted for the existing conditions and three other scenarios using 2017 forecasted turning movement counts. The 2017 counts were forecasted by applying a 2% growth rate to the 2010 counts. Table 5 provides the results of the existing geometry and signal timing analysis. The intersection operates at a LOS F during the AM peak hour. During the midday period overall operations are a LOS C. The PM peak hour operates at a LOS E with the northbound through and southbound lefts operating at a LOS F.

Table 5 – 2017 Existing Geometry and Signal Timing LOS

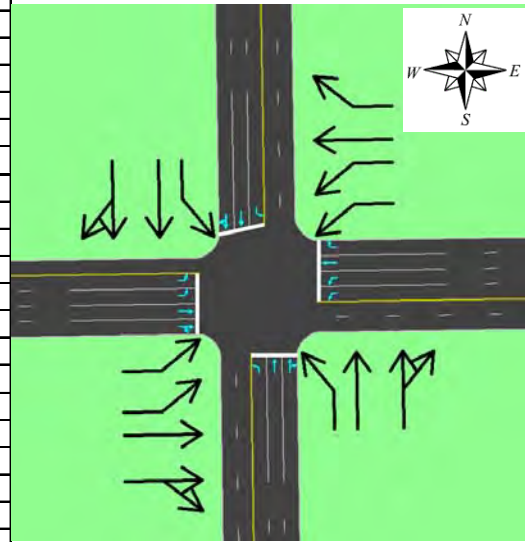
AM PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	50.1	95.0	247.0	28.9	19.3	23.8	26.9	19.0	33.1
	LOS	D	F	F	C	B	C	C	B	C
	Approach Delay (Seconds)	86.3		170.4			26.7		31.3	
	Approach LOS	F		F			C		C	
	Intersection Delay (Seconds)	90.7								
Intersection LOS	F									
MIDDAY PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	42.6	34.9	42.8	42.0	21.1	21.8	32.6	21.3	24.4
	LOS	D	C	D	D	C	C	C	C	C
	Approach Delay (Seconds)	36.9		35.5			31.8		23.7	
	Approach LOS	D		D			C		C	
	Intersection Delay (Seconds)	31.5								
Intersection LOS	C									
PM PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	72.2	43.8	76.1	70.9	27.4	27.8	94.2	82.0	32.3
	LOS	E	D	E	E	C	C	F	F	C
	Approach Delay (Seconds)	51.6		63.1			88.2		47.0	
	Approach LOS	D		E			F		D	
	Intersection Delay (Seconds)	67.1								
Intersection LOS	E									



The second scenario analyzed involved using the existing intersection geometry with Synchro optimized signal timings. Optimizing the signal timing provided improved LOS during all three analysis periods. It eliminated the failing movements and approaches in the AM peak hour. However, several movements continue to operate at a LOS E and LOS F. was the westbound through movement during the PM peak hour. All approaches operate at LOS E or better except the westbound approach in the PM peak. Table 6 provides the details of the operational analysis for this scenario.

Table 6 – 2017 Optimized Signal Timings LOS

AM PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	60.1	77.8	69.4	25.4	15.9	37.7	42.0	29.9	63.7
	LOS	E	E	E	C	B	D	D	C	E
	Approach Delay (Seconds)	74.4		53.2			41.8		59.5	
	Approach LOS	E		D			D		E	
	Intersection Delay (Seconds)	59.8								
Intersection LOS	E									
MIDDAY PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	31.4	26.2	34.9	40.8	17.3	16.2	25.2	21.1	20.1
	LOS	C	C	C	D	B	B	C	C	C
	Approach Delay (Seconds)	27.5		31.7			24.6		20.3	
	Approach LOS	C		C			C		C	
	Intersection Delay (Seconds)	25.8								
Intersection LOS	C									
PM PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	52.8	37.8	50.3	113.1	25.1	18.1	51.1	88.1	21.0
	LOS	D	D	D	F	C	B	D	F	C
	Approach Delay (Seconds)	42.0		80.3			48.1		40.8	
	Approach LOS	D		F			D		D	
	Intersection Delay (Seconds)	53.2								
Intersection LOS	D									

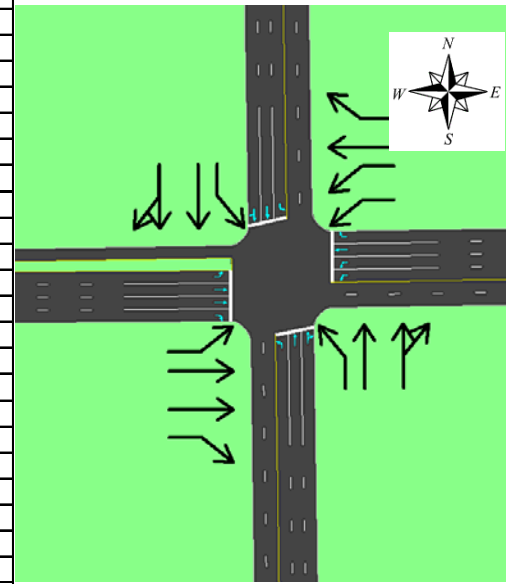


The third analysis scenario examined improvements to the eastbound approach of the intersection. This approach currently consists of dual left turn lanes and two through lanes with the outermost through lane facilitating right turns. This approach was modified to a single left turn lane, two through lanes and an exclusive right turn lane. Synchro optimized signal timings were used for this analysis. This scenario provided LOS E or better for all movements and approaches to the intersection except the westbound

through movement and the southbound left movement during the PM peak hour. Table 7 provides the analysis results.

Table 7 – 2017 Eastbound Lane Improvements LOS

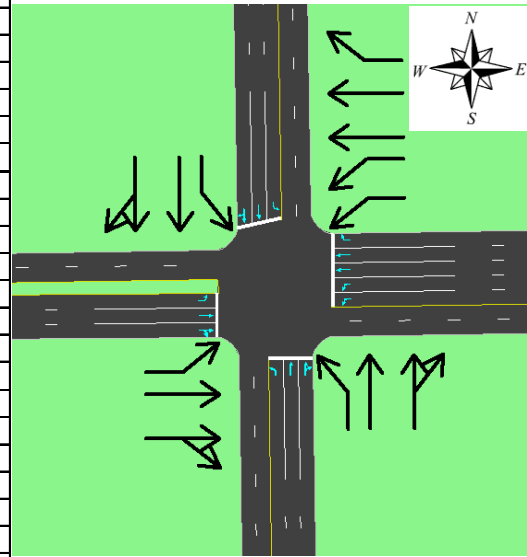
AM PEAK		Gulf Beach Hwy			Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	63.9	64.0	34.9	68.5	32.1	20.7	36.8	40.8	29.2	59.4
	LOS	EBL	EBT	C	E	C	C	D	D	C	E
	Approach Delay (Seconds)	62.2			54.7			40.6		55.6	
	Approach LOS	E			D			D		E	
	Intersection Delay (Seconds)	55.6									
	Intersection LOS	E									
MIDDAY PEAK		Gulf Beach Hwy			Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	23.3	25.2	21.1	34.4	40.8	16.9	16.2	25.2	21.1	20.1
	LOS	C	C	C	C	D	B	B	C	C	C
	Approach Delay (Seconds)	24.4			31.4			24.6		20.3	
	Approach LOS	C			C			C		C	
	Intersection Delay (Seconds)	25.1									
	Intersection LOS	C									
PM PEAK		Gulf Beach Hwy			Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	59.9	33.7	29.0	45.3	87.2	27.8	17.2	59.2	91.3	21.0
	LOS	E	C	C	D	F	C	B	E	F	C
	Approach Delay (Seconds)	40.8			65.1			55.4		41.8	
	Approach LOS	D			E			D		C	
	Intersection Delay (Seconds)	52.3									
	Intersection LOS	D									



The final scenario analyzed improvements to the westbound leg of the intersection. This leg currently consists of dual left turn lanes, a single through lane, and a dedicated right turn lane. This approach was modified to accommodate an additional westbound through lane. In addition the dual eastbound left turn lane was reduced to a single lane. These modifications resulted in all movements and approaches operating with a LOS E or better in all three analysis periods. The results of this analysis are detailed in Table 4.

Table 8 – 2017 Westbound Lane Improvements LOS

AM PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	31.6	77.1	71.3	23.9	16.5	40.0	44.1	31.8	62.8
	LOS	C	E	E	C	B	D	D	C	E
	Approach Delay (Seconds)	68.3		54.1			43.9		59.0	
	Approach LOS	E		D			D		E	
	Intersection Delay (Seconds)	58.4								
	Intersection LOS	E								
MIDDAY PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
	Movement	EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	17.4	25.6	32.6	22.7	16.5	15.0	24.2	20.1	19.7
	LOS	B	C	C	C	B	B	C	C	B
	Approach Delay (Seconds)	23.5		23.4			23.5		19.8	
	Approach LOS	C		C			C		B	
	Intersection Delay (Seconds)	22.4								
	Intersection LOS	C								
PM PEAK		Gulf Beach Hwy		Gulf Beach Hwy			Navy Blvd		Navy Blvd	
		EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
	Delay (Seconds)	42.1	40.1	50.2	45.5	24.0	12.9	35.2	40.2	15.2
	LOS	D	D	D	D	C	B	D	D	B
	Approach Delay (Seconds)	40.7		42.2			33.2		22.6	
	Approach LOS	D		D			C		C	
	Intersection Delay (Seconds)	34.2								
	Intersection LOS	C								



2017 Analysis Results

Each of the three alternatives resulted in improved traffic operations at the intersection. However, unlike the 2010 analyses by 2017 geometric improvements become necessary. Improvements shown in the diagram included within Table 8 seem to provide the greatest operational improvements over the three analysis period (AM, Midday and PM). As with the 2010 analyses, further study may be required to determine the impacts of these changes revision on the operations of adjacent

intersections. If these intersections are part of a coordinated signal system the timing may have to be adjusted on those as well.

Appendix A

Traffic Data

**Engineering & Planning Resources, PC
Pensacola, FL**

INTERSECTION OF N. NAVY BLVD./GULF BEACH HWY

COUNTED BY: BP COUNT DATE: 4/7/2010

AM TMC

	Gulf Beach Hwy East			N. Navy Blvd. North			Barrancas Ave. West			N. Navy Blvd. South			
Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	TOTAL
6:00	15	49	4	5	51	0	67	19	11	9	147	3	380
6:15	18	76	6	8	53	0	175	24	13	13	157	2	545
6:30	27	99	11	4	54	0	141	36	17	11	178	3	581
6:45	54	118	13	7	57	0	158	39	29	16	248	3	742
TOTAL	114	342	34	24	215	0	541	118	70	49	730	11	2248
7:00	39	128	12	10	42	0	126	68	28	13	174	7	647
7:15	53	164	21	4	88	0	157	64	26	21	221	5	824
7:30	70	210	13	3	88	0	170	54	27	26	163	15	839
7:45	33	173	9	5	88	0	170	56	26	40	171	7	778
TOTAL	195	675	55	22	306	0	623	242	107	100	729	34	3088
8:00	29	165	16	9	85	0	184	74	34	28	228	5	857
8:15	26	138	11	5	66	0	146	59	33	27	116	11	638
8:30	39	129	4	2	77	0	131	65	24	25	112	12	620
8:45	34	126	8	1	68	0	54	62	34	25	80	7	499
TOTAL	128	558	39	17	296	0	515	260	125	105	536	35	2614

PEAK HOUR DATA

PEAK HR START TIME 7:15

Gulf Beach Hwy East			N. Navy Blvd. North			Barrancas Ave. West			N. Navy Blvd. South			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	TOTAL

PEAK HR TOTALS	185	712	59	21	349	0	681	248	113	115	783	32	3298
% OF APPROACH	19.4%	74.5%	6.2%	5.7%	94.3%	0.0%	65.4%	23.8%	10.8%	12.4%	84.2%	3.4%	
PEAK HR FACTOR	0.816			0.995			1.034			0.871			

Engineering & Planning Resources, PC
Pensacola, FL

INTERSECTION OF N. NAVY BLVD./GULF BEACH HWY

COUNTED BY: AD COUNT DATE: 4/7/2010

Mid Day TMC

	Gulf Beach Hwy East			N. Navy Blvd. North			Barrancas Ave. West			N. Navy Blvd. South			
Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	TOTAL
11:00	50	109	11	25	231	2	43	59	38	38	125	24	755
11:15	35	99	9	8	176	4	30	69	67	36	115	20	668
11:30	46	120	6	6	161	4	75	64	34	34	139	23	712
11:45	34	94	12	6	147	0	24	49	58	43	76	18	561
TOTAL	165	422	38	45	715	10	172	241	197	151	455	85	2696
12:00	40	77	4	9	169	0	52	82	71	59	85	27	675
12:15	37	107	15	5	127	2	51	77	78	58	140	28	725
12:30	33	118	12	16	140	1	51	79	48	28	188	30	744
12:45	37	74	9	14	152	0	50	63	41	40	103	28	611
TOTAL	147	376	40	44	588	3	204	301	238	185	516	113	2755

PEAK HOUR DATA

PEAK HR START TIME 12:00

Gulf Beach Hwy East			N. Navy Blvd. North			Barrancas Ave. West			N. Navy Blvd. South			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	TOTAL

PEAK HR TOTALS	147	376	40	44	588	3	204	301	238	185	516	113	2755
% OF APPROACH	26.1%	66.8%	7.1%	6.9%	92.6%	0.5%	27.5%	40.5%	32.0%	22.7%	63.4%	13.9%	
PEAK HR FACTOR	0.818			0.615			0.902			0.827			

**Engineering & Planning Resources, PC
Pensacola, FL**

INTERSECTION OF N. NAVY BLVD./GULF BEACH HWY

COUNTED BY: AD COUNT DATE: 4/7/2010

PM TMC

	Gulf Beach Hwy East			N. Navy Blvd. North			Barrancas Ave. West			N. Navy Blvd. South			
Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	TOTAL
15:00	58	98	10	17	242	1	32	84	46	54	69	68	779
15:15	45	124	6	25	151	0	43	86	43	46	53	36	658
15:30	29	97	3	30	284	0	42	94	55	53	112	46	845
15:45	39	80	7	24	275	0	45	102	44	55	40	44	755
TOTAL	171	399	26	96	952	1	162	366	188	208	274	194	3037
16:00	50	83	7	22	246	1	46	107	30	54	45	45	736
16:15	27	98	3	30	269	1	41	117	26	43	69	87	811
16:30	49	85	6	34	220	0	57	100	38	50	89	40	50
16:45	38	92	3	21	172	0	37	141	44	39	75	61	723
TOTAL	164	358	19	107	907	2	181	465	138	186	278	233	3038
17:00	88	108	9	34	191	0	36	100	44	51	129	64	854
17:15	15	91	5	29	139	1	45	147	39	59	90	38	698
17:30	78	98	4	23	141	1	45	161	39	39	75	29	50
17:45	31	91	11	19	125	0	35	95	24	52	87	42	612
TOTAL	212	388	29	105	596	2	161	503	146	201	381	173	2897

PEAK HOUR DATA

PEAK HR START TIME 15:30

Gulf Beach Hwy East			N. Navy Blvd. North			Barrancas Ave. West			N. Navy Blvd. South			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	TOTAL

PEAK HR TOTALS	145	358	20	106	1074	2	174	420	155	205	266	222	3147
% OF APPROACH	27.7%	68.5%	3.8%	9.0%	90.9%	0.2%	23.2%	56.1%	20.7%	29.6%	38.4%	32.0%	
PEAK HR FACTOR	0.747			0.941			0.843			0.821			

Engineering & Planning Resources, PC

Pensacola, Florida 32514

Location: N. Navy Blvd. Barrancas Ave Right Turn Lane
 County: Escambia Station #: 1
 Start Date: 6-Apr-10 Start Time: 0:00

Time	NB					Combined
	1st	2nd	3rd	4th	Hour Tot.	Total
0:00	4	1	3	1	9	9
1:00	1	0	1	0	2	2
2:00	3	2	1	0	6	6
3:00	0	1	0	0	1	1
4:00	2	1	4	1	8	8
5:00	6	4	6	10	26	26
6:00	16	18	12	20	66	66
7:00	30	33	48	50	161	161
8:00	26	29	36	30	121	121
9:00	28	54	41	60	183	183
10:00	67	58	49	72	246	246
11:00	88	69	98	69	324	324
12:00	73	54	68	60	255	255
13:00	64	42	47	72	225	225
14:00	75	80	119	100	374	374
15:00	144	88	162	122	516	516
16:00	168	160	141	104	573	573
17:00	104	70	86	56	316	316
18:00	47	50	37	40	174	174
19:00	40	34	26	18	118	118
20:00	25	22	22	11	80	80
21:00	24	9	19	30	82	82
22:00	11	14	9	8	42	42
23:00	9	6	14	7	36	36
Total					3944	3944

Peak Hour Summary

Direction: Eastbound		
	Hour	Volume
A.M	1045	327
P.M	1530	612

Engineering & Planning Resources, PC

Pensacola, Florida 32514

Location: N. Navy Blvd. Barrancas Ave Right Turn Lane
 County: Escambia Station #: 1
 Start Date: 7-Apr-10 Start Time: 0:00

Time	EB					Combined
	1st	2nd	3rd	4th	Hour Tot.	Total
0:00	8	0	2	3	13	13
1:00	3	1	2	0	6	6
2:00	1	0	1	0	2	2
3:00	2	1	0	1	4	4
4:00	1	0	1	0	2	2
5:00	2	7	8	8	25	25
6:00	13	10	8	26	57	57
7:00	28	38	41	58	165	165
8:00	49	37	34	32	152	152
9:00	34	52	55	64	205	205
10:00	82	72	76	88	318	318
11:00	95	81	76	88	340	340
12:00	90	62	47	49	248	248
13:00	67	46	72	66	251	251
14:00	51	76	92	93	312	312
15:00	134	110	184	133	561	561
16:00	172	140	128	108	548	548
17:00	111	80	83	66	340	340
18:00	47	60	43	41	191	191
19:00	50	33	30	21	134	134
20:00	28	23	18	12	81	81
21:00	18	7	14	24	63	63
22:00	15	10	8	13	46	46
23:00	14	6	15	4	39	39
Total					4103	4103

Peak Hour Summary

Direction: Eastbound		
	Hour	Volume
A.M	1030	340
P.M	1530	629

Engineering & Planning Resources, PC
Pensacola, Florida 32514

Location:	<u>N. Navy Blvd. Barrancas Ave Right Turn Lane</u>		
County:	<u>Escambia</u>	Station #:	<u>1</u>
Start Date:	<u>8-Mar-10</u>	Start Time:	<u>0:00</u>

Time	EB					Combined
	1st	2nd	3rd	4th	Hour Tot.	Total
0:00	3	3	5	3	14	14
1:00	3	1	0	1	5	5
2:00	1	4	4	2	11	11
3:00	0	0	0	0	0	0
4:00	0	1	1	0	2	2
5:00	1	9	9	14	33	33
6:00	10	10	20	13	53	53
7:00	24	36	46	54	160	160
8:00	35	36	26	33	130	130
9:00	17	32	39	38	126	126
10:00	50	33	49	43	175	175
11:00	80	74	53	44	251	251
12:00	62	69	60	65	256	256
13:00	72	66	80	64	282	282
14:00	74	94	107	103	378	378
15:00	149	124	164	141	578	578
16:00	171	169	116	108	564	564
17:00	110	94	80	67	351	351
18:00	59	52	56	48	215	215
19:00	36	30	21	20	107	107
20:00	25	24	24	15	88	88
21:00	12	14	16	20	62	62
22:00	13	8	9	6	36	36
23:00	7	10	10	8	35	35
Total					3912	3912

Peak Hour Summary

Direction: Eastbound	
Hour	Volume
A.M 1100	251
P.M 1530	645

Appendix B






















Optimized Signal Timing

HCM Signalized Intersection Capacity Analysis

3: Gulf Beach Hwy & N Navy Blvd

Optimized Signal Timing

Timing Plan: AM Peak


												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	185	712	59	681	248	113	21	349	0	115	783	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95		0.97	1.00	1.00	1.00	0.95		1.00	0.95	
Flt Protected	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.21	1.00		0.34	1.00	
Satd. Flow (prot)	3433	3499		3433	1863	1583	1770	3539		1770	3518	
Satd. Flow (perm)	3433	3499		3433	1863	1583	386	3539		637	3518	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	201	774	64	740	270	123	23	379	0	125	851	35
RTOR Reduction (vph)	0	7	0	0	0	66	0	0	0	0	3	0
Lane Group Flow (vph)	201	831	0	740	270	57	23	379	0	125	883	0
Turn Type	Prot			Prot		pm+ov	pm+pt			pm+pt		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	9.2	21.2		20.0	32.0	39.8	21.9	19.3		31.6	24.5	
Effective Green, g (s)	9.2	21.2		20.0	32.0	39.8	21.9	19.3		31.6	24.5	
Actuated g/C Ratio	0.11	0.25		0.23	0.37	0.46	0.25	0.22		0.37	0.28	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	366	860		796	691	813	140	791		336	999	
v/s Ratio Prot	0.06	c0.24		c0.22	0.14	0.01	0.00	0.11		c0.03	c0.25	
v/s Ratio Perm						0.03	0.04			0.10		
v/c Ratio	0.55	0.97		0.93	0.39	0.07	0.16	0.48		0.37	0.88	
Uniform Delay, d1	36.6	32.2		32.5	20.0	12.9	25.2	29.1		19.1	29.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	22.6		17.0	0.4	0.0	0.6	0.5		0.7	9.4	
Delay (s)	38.3	54.8		49.4	20.3	13.0	25.7	29.6		19.8	38.9	
Level of Service	D	D		D	C	B	C	C		B	D	
Approach Delay (s)		51.6			38.5			29.4			36.6	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM Average Control Delay			40.7			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			86.3			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			82.0%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Gulf Beach Hwy & N Navy Blvd

Optimized Signal Timing

Timing Plan: MID Peak

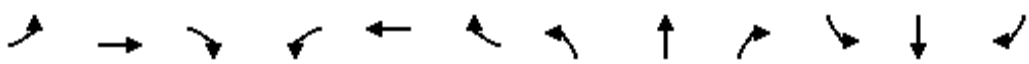
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕		↔↔	↕	↗	↔	↕↕		↗	↕↕	
Volume (vph)	147	376	40	204	301	238	44	588	3	185	516	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95		0.97	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3489		3433	1863	1583	1770	3537		1770	3444	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.32	1.00		0.21	1.00	
Satd. Flow (perm)	3433	3489		3433	1863	1583	601	3537		392	3444	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	409	43	222	327	259	48	639	3	201	561	123
RTOR Reduction (vph)	0	12	0	0	0	45	0	1	0	0	27	0
Lane Group Flow (vph)	160	440	0	222	327	214	48	641	0	201	657	0
Turn Type	Prot			Prot		pm+ov	pm+pt			pm+pt		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	5.4	15.0		7.1	16.7	24.1	21.0	17.1		28.0	20.6	
Effective Green, g (s)	5.4	15.0		7.1	16.7	24.1	21.0	17.1		28.0	20.6	
Actuated g/C Ratio	0.08	0.23		0.11	0.26	0.37	0.33	0.26		0.43	0.32	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	810		377	482	701	266	936		328	1098	
v/s Ratio Prot	0.05	0.13		c0.06	c0.18	0.03	0.01	0.18		c0.07	0.19	
v/s Ratio Perm						0.10	0.05			c0.20		
v/c Ratio	0.56	0.54		0.59	0.68	0.31	0.18	0.69		0.61	0.60	
Uniform Delay, d1	28.5	21.8		27.4	21.5	14.3	15.2	21.3		12.7	18.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.7		2.3	3.8	0.2	0.3	2.1		3.4	0.9	
Delay (s)	30.8	22.5		29.7	25.3	14.6	15.5	23.4		16.1	19.4	
Level of Service	C	C		C	C	B	B	C		B	B	
Approach Delay (s)		24.7			23.1			22.9			18.7	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM Average Control Delay			22.1			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			64.6			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			63.3%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Gulf Beach Hwy & N Navy Blvd

Optimized Signal Timing

Timing Plan: PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔↔	↕	↔	↔	↕↔		↔	↕↔	
Volume (vph)	145	358	20	174	420	155	106	1074	2	205	266	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95		0.97	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3511		3433	1863	1583	1770	3538		1770	3298	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.42	1.00		0.11	1.00	
Satd. Flow (perm)	3433	3511		3433	1863	1583	775	3538		208	3298	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	389	22	189	457	168	115	1167	2	223	289	241
RTOR Reduction (vph)	0	5	0	0	0	18	0	0	0	0	145	0
Lane Group Flow (vph)	158	406	0	189	457	150	115	1169	0	223	385	0
Turn Type	Prot			Prot		pm+ov	pm+pt			pm+pt		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	7.4	21.4		9.0	23.0	31.5	39.1	33.2		44.3	35.8	
Effective Green, g (s)	7.4	21.4		9.0	23.0	31.5	39.1	33.2		44.3	35.8	
Actuated g/C Ratio	0.08	0.24		0.10	0.26	0.35	0.43	0.37		0.49	0.40	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	282	834		343	476	632	401	1304		250	1310	
v/s Ratio Prot	0.05	0.12		c0.06	c0.25	0.02	0.02	0.33		c0.08	0.12	
v/s Ratio Perm						0.07	0.11			c0.35		
v/c Ratio	0.56	0.49		0.55	0.96	0.24	0.29	0.90		0.89	0.29	
Uniform Delay, d1	39.8	29.6		38.6	33.1	20.8	15.5	26.8		20.3	18.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	0.5		1.9	31.1	0.2	0.4	8.4		30.2	0.1	
Delay (s)	42.3	30.1		40.5	64.2	21.0	15.9	35.2		50.5	18.6	
Level of Service	D	C		D	E	C	B	D		D	B	
Approach Delay (s)		33.5			49.8			33.5			28.1	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM Average Control Delay			36.2			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			90.1			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			84.0%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

