Intersection Analysis Study

SR 5 (US 1) at Herbert Street

VOLUSIA COUNTY
SECTION 79010
MP 27.720

Continuing Services for Traffic Operations
Contract Number C-8W24
Financial Project No. 237974-1-32-10
Work Order No. 44
Sequence No. 1
Study 7

FDA No. 390.44

Prepared For:

Prepared By:

Faller, Davis & Associates, Inc.
CONSULTING ENGINEERS

Maitland, Florida
December 2011

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STATE OF
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12/16/11

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P.E. No. 58730

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EXECUTIVE SUMMARY

Faller, Davis & Associates, Inc. (FDA) conducted an Intersection Analysis Study at the intersection of SR 5 (US 1) at Herbert Street in Port Orange, Volusia County, Florida. An arterial investment study (AIS) was performed for SR 5 in Volusia County in 2006. The study recommended various intersection-level improvements at several locations. This intersection was included in those recommendations and at the time of this study, the design was ongoing.

The purpose of this intersection analysis study is to evaluate the need and feasibility of the improvements identified in the AIS, as well as the need for other additional improvements to address observed operational or safety issues. The improvements developed in the AIS, which are being incorporated into the design, include the addition of a southbound right turn lane, an eastbound right turn lane, the extension of the northbound and southbound left turn lanes, and the addition of bike lanes along US 1. This is referred to as Alternative 1 in this study.

Based on the results of the analysis, field observations, and engineering judgment, the following recommendations and conclusions were developed:

Providing a southbound right turn lane, as recommended in the AIS, will result in minimal improvement to intersection delay over the no build condition in current and future years. Southbound U-turn movements would need to be restricted with this improvement. As such, a southbound right turn lane is not recommended, and the north and south approach medians will not need to be reconstructed to accommodate the widening. Since the existing mainline left turn lanes do not meet standards, the mainline left turn lanes could be extended. The addition of an eastbound right turn lane significantly reduces eastbound approach delay at the intersection. Alternative 4 is recommended, which includes the addition of eastbound right turn lane and the development of coordinated timings between the intersection of Dunlawton Avenue and Herbert Street. Bike lanes could be added along US 1 as recommended in the AIS without impacting the existing operations.

1. INTRODUCTION

The Florida Department of Transportation has retained Faller, Davis & Associates, Inc. (FDA) to perform an Intersection Analysis study at the intersection of SR 5 (US 1) at Herbert Street in Port Orange, Volusia County, Florida. The analysis methods used in conducting this study are consistent with those set forth in the Manual on Uniform Traffic Control Devices (MUTCD 2009), the Manual on Uniform Traffic Studies (MUTS), and FDOT District 5 guidelines and procedures.

Figure 1-Project Location Map

2. EXISTING CONDITIONS

The intersection of SR 5 (US 1) at Herbert Street is located in Port Orange, Florida. Significant features for the intersection are summarized below:

Table 1-Summary of Existing Conditions

Feature	Description
Main Street	• US 1
Side Street	• Herbert Street
Area Location	• The intersection is located 775 feet north of SR 421/SR A1A (Dunlawton Avenue) and 1.6 miles east of SR 5A (Nova Road).
Surrounding Development	• The development along US 1 is commercial.
Land Uses at Intersection	• Northeast-Family Dentistry • Northwest-Shell/Food Mart • Southwest-Art Haus • Southeast-Dunkin Donuts
Pedestrian Generators	• Bus stops, schools, and convenience store in the vicinity of the intersection
Traffic Control	• Herbert Street is signalized with protected-permissive north-south left turn phasing and an east-west phase.
Adjacent Signalized Intersections	• North Approach: Venture Drive approximately 0.66 miles north • South Approach: SR 421 (Dunlawton Avenue) approximately 0.15 miles south • East Approach: N/A • West Approach: SR 5A (Nova Road) approximately 1.6 miles west
US 1	• Function-Major arterial roadway in Volusia County • Connectivity-SR 44 to the south and SR 400 to the north • Cross Section-Four lanes with a grassed median, an urban typical section, and a closed drainage system • Posted Speed Limit-North Approach: 40 mph, South Approach: 40 mph • North Approach Lanes-Two through lanes and a left turn lane • South Approach Lanes-Two through lanes and a left turn lane • Alignment-Straight and level in the vicinity of the intersection • Sidewalks-Both sides of roadway • Utilities-Overhead power lines on both sides of the roadway • Street Lighting-Light poles on both sides of the roadway
Herbert Street	• Function-Neighborhood street • Connectivity-CR 483 to Halifax Drive • Cross Section-Two lanes with a closed drainage system • Posted Speed Limit-East Approach: N/A, West Approach: 35 mph • East Approach Lanes-One multi-purpose lane • West Approach Lanes-One multi-purpose lane • Alignment-Straight and level • Sidewalks-Both sides of roadway on the west approach • Utilities-Overhead utilities on south side of roadway • Street Lighting-Business lighting
Other Distinct Features	• On-street parking is provided along both sides of US 1.

Traffic Volumes

Eight-hour turning movement counts were conducted from 7:00 to 9:00 AM, 11:00 AM to 1:00 PM, and 2:00 to 6:00 PM. The count reveals that the peak traffic volumes on US 1 occur from 5:00 to 6:00 PM with a total of 1,777 vehicles per hour (vph) approaching the intersection. The peak traffic volumes on Herbert Street occur from 4:15 to 5:15 PM with 171 vph approaching the intersection. The following table summarizes the minimum and maximum and distribution of turning movements during the eight highest hours:

Table 2-Turning Movement Count Summary

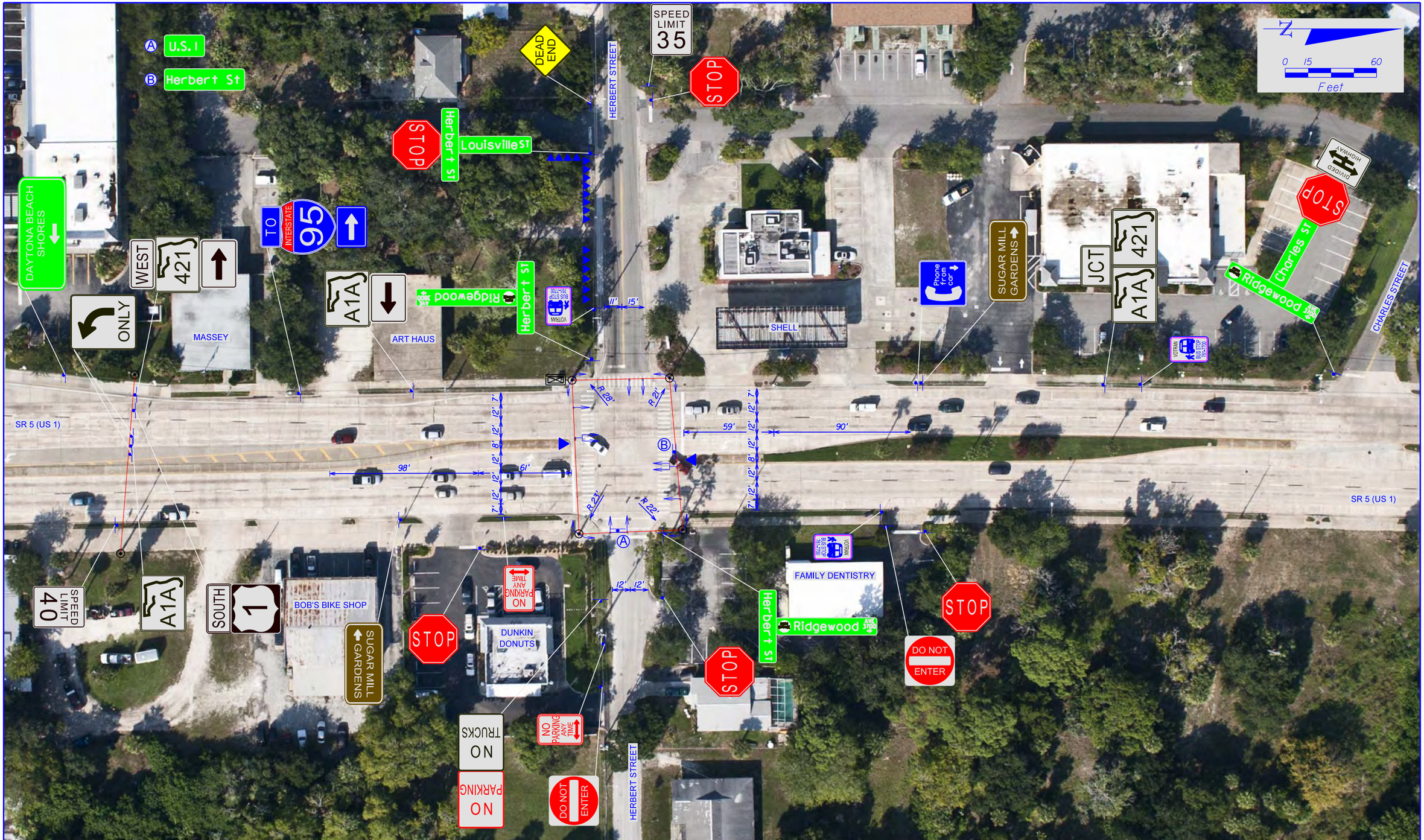
MOVEMENT		NB		SB		EB		WB	
		Min	Max	Min	Max	Min	Max	Min	Max
Left	Volume	42	87	1	21	42	71	5	15
	App % Avg	11%		1%		45%		60%	
Through	Min - Max	353	718	399	995	0	5	0	4
	App % Avg	87%		92%		3%		11%	
Right	Min - Max	1	5	29	86	44	83	1	10
	App % Avg	<1%		7%		52%		29%	
U-Turn	Min - Max	5	19	1	4	0	2	0	0
	App % Avg	2%		<1%		<1%		0%	

Two pedestrians and six bicyclists were observed crossing US 1 during the count period. Fourteen pedestrians and twenty-six bicyclists were observed crossing Herbert Street during the count period. Turning movement, pedestrian, and bicycle data is presented in further detail in the appendix.

Collision Data

Crash data was provided by the Florida Department of Transportation for the intersection of US 1 at Herbert Street for the 12-month period ending June 30, 2010. Two angle collisions, two left turn collisions, one right turn collision, and one backed into collision occurred at the intersection. These collisions resulted in one non-incapacitating injury and one possible injury. All of the collisions occurred in daylight on dry pavement and resulted in an estimated $35,800 in property damage.

Collision summary and collision plots of the intersection have been included on the following pages of this report.



CONTROLLER CABINET
TRAFFIC SIGNAL POLE
SIGNAL HEAD
SIGN
DELINEATOR
POWER POLE
LIGHT POLE
HYDRANT
DITCH BOTTOM INLET
MANHOLE
MITERED END SECTION
DRAINAGE INLET
GUARDRAIL
FENCE
TREE/SHRUB
BUILDING

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FIGURE 2
CONDITION DIAGRAM
CONTINUING SERVICES FOR TRAFFIC OPERATIONS

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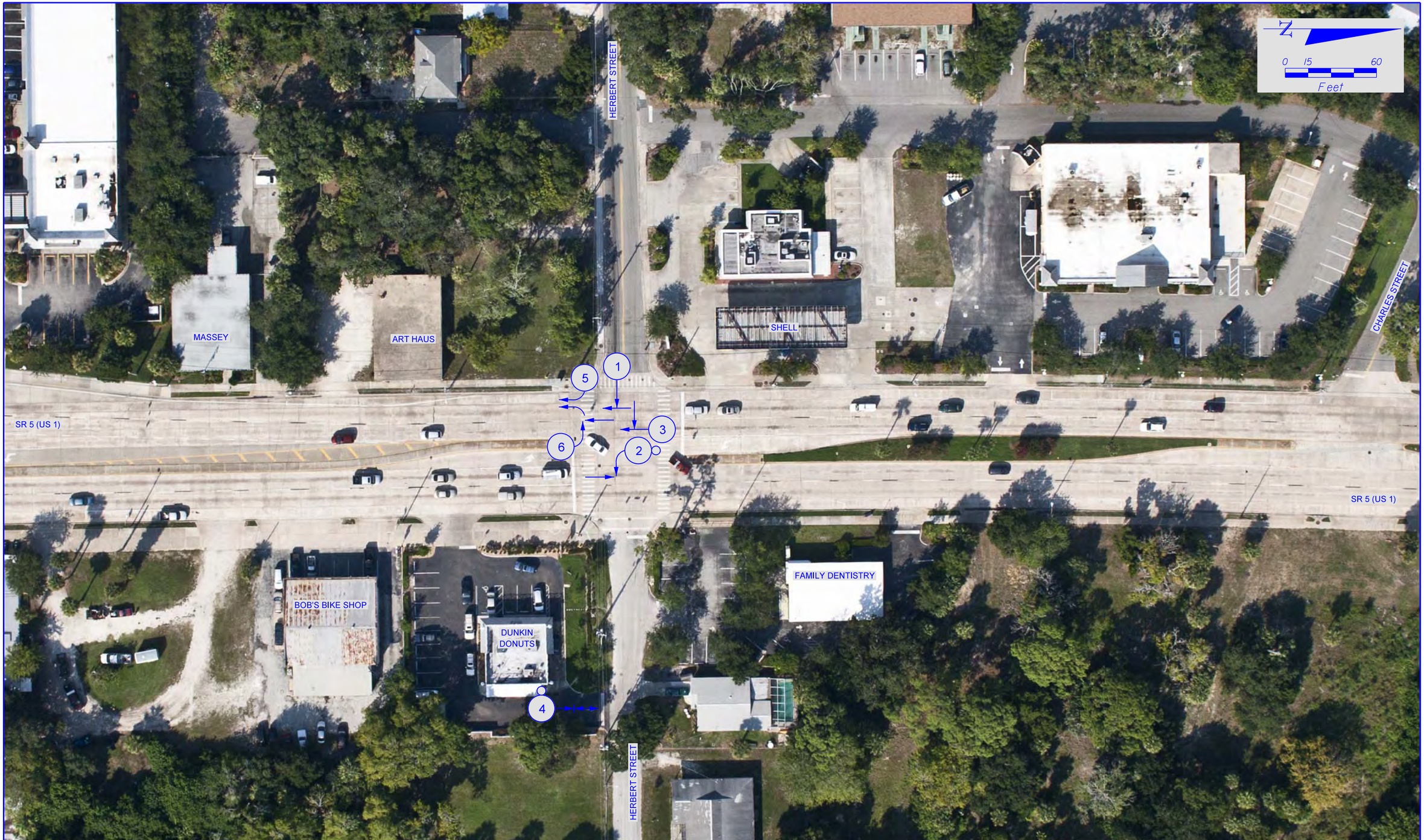

⊗ FATAL	REAR END	RIGHT TURN	LEFT TURN	HIT BIKE
○ INJURY	SIDESWIPE	HIT PEDESTRIAN	OVERTURNED	HIT SIGN
(XX) COLLISION NUMBER	OUT OF CONTROL		HEAD ON	HIT UTILITY POLE
	BACKED INTO	ANGLE	HIT MOVEABLE OBJECT	HIT PARKED CAR

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FIGURE 3
COLLISION DIAGRAM
CONTINUING SERVICES FOR TRAFFIC OPERATIONS

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Table 3-Collision Summary

Section: 79010
Intersecting Street: Herbert Street
Source Data: Hard Copy Crash Reports
Study Period: From 7/1/2009 to 6/30/2010 12 Months

Route: SR 5 (US 1)
County: Volusia
City: Port Orange

No.	Long or Short Form	Date	Day	Time	DOB	Age	Alcohol / Drugs	Lighting Condition	Roadway Surface	Weather	Fatal	Injury	Most Severe Injury	Harmful Event	Property Damage	Vision Obstructed	Contributing Cause
1	L	8/12/2009	Wednesday	7:11	6/29/1988	21	None	Daylight	Dry	Clear	0	0	None	Angle	$4,500	None	Disregarded Traffic Signal
2	L	9/8/2009	Tuesday	17:13	3/13/1925	85	None	Daylight	Dry	Clear	0	1	Non-Incapacitating	Left Turn	$18,000	None	FTYRW
3	S	10/27/2009	Tuesday	11:49	8/6/1951	58	None	Daylight	Dry	Clear	0	0	None	Angle	$4,000	None	Disregarded Traffic Signal
4	L	10/29/2009	Thursday	10:17	3/9/1982	28	None	Daylight	Dry	Clear	0	1	Possible	Backed Into	$2,500	None	Improper Backing
5	S	5/3/2010	Monday	15:28	12/25/1932	77	None	Daylight	Dry	Clear	0	0	None	Right Turn	$4,000	None	FTYRW
6	S	5/31/2010	Monday	7:40	9/4/1972	38	None	Daylight	Dry	Clear	0	0	None	Left Turn	$2,800	None	Improper Turn

Crash Statistics							Injury Severity					Lighting			Roadway Condition		
Total Number of Crashes	Total Number of Long Form Crashes	Total Property Damage	Total Number of Fatalities	Total Number of Fatal Crashes	Total Number of Injuries	Total Number of Injury Crashes	None	Possible	Non-Incapacitating	Incapacitating	Fatal	Daylight	Dark (SL)	Dark (No SL)	Wet	Dry	Unknown
6	3	$35,800	0	0	2	2	4	1	1	0	0	6	0	0	0	6	0
100%	50%	N/A	N/A	0%	N/A	33%	67%	17%	17%	0%	0%	100%	0%	0%	0%	100%	0%

Rear End	Head On	Angle	Left Turn	Right Turn	Sideswipe	Backed Into	Parked Car	Collision with MV Other Road	Pedestrian	Bike	Bike (Bike Lane)	Moped	Train	Animal	Hit Sign/Sign Post	Hit Utility Pole	Hit Guardrail
0	0	2	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0
0%	0%	33%	33%	17%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Hit Fence	Hit Concrete Barrier Wall	Hit Bridge/Pier/Abuttment	Hit Tree/Shrub	Hit Const Barricd/Sign/BrdgPier/Abutt	Traffic Gate	Crash Attenuator	Fixed Object Above Road	Other Fixed Object	Moveable Object	Ran Into Ditch/Culvert	Ran Off Road Into Water	Overturned	Occupant Fell From Vehicle	Trac/Trailer Jackknifed	Fire	Explosion	All Other
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

No Improper Driving	Careless Driving	FTYRW	Improper Backing	Improper Lane Change	Improper Turn	Followed Too Closely	Disregarded Traffic Signal	Exceed Safe Speed Limit	Disregarded Stop Sign	Failed to Maintain Equipment /	Improper Passing	Drove Left of Center	Exceeded Stated Safe Speed Limit	Obstructing Traffic	Improper Load	All Other	Alcohol/Drugs-Under Influence
0	0	2	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0
0%	0%	33%	17%	0%	17%	0%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

3. QUALITATIVE ASSESSMENT

The intersection of US 1 and Herbert Street was observed by a registered professional engineer in the morning (7:00 to 9:00 AM) and afternoon (4:00 to 5:30 PM) peak periods to assess existing operating conditions and to determine if modifications are needed to improve the safety and efficiency of the intersection.

Request: The Department requested an evaluation of the improvements identified in the US 1 AIS, as well as the need for other additional improvements to address observed operational or safety issues.

Operations: Operations include the efficiency of operation and interaction of motor vehicles, pedestrians, and bicycles at the intersection. Following are the observations relating to these factors:

- The intersection is signalized and configured as a box span with concrete strain poles located in each quadrant of the intersection. The signal operating plan includes protected-permissive mainline left turn phases and an east-west phase. Signalized pedestrian crossings with countdown pedestrian signals and ADA compliant pedestrian detectors are provided for each approach to the intersection.

- The traffic signal operates in coordinated mode with Dunlawton Avenue to the south during the weekday and weekend peak traffic periods utilizing a single coordination plan.

- Northbound (620 vph) and southbound (760 vph) are the predominant directions of travel at the intersection.

- The northbound left turn/U-turn movement is the heaviest turning movement on US 1 averaging approximately 65 left turning vph and approximately 15 U-turning vph. The maximum queue observed for the northbound left turn/U-turn movement was three vehicles during the afternoon peak period.

- The eastbound left and right turn movements are the predominant side street movements at the intersection averaging approximately 60 left turning vph and approximately 65 right turning vph. The maximum queue observed on Herbert Street was eight eastbound vehicles during the morning peak period.

- The southbound right turn movement averaged approximately 50 vph during the eight hour count period.

- The signal timings were observed to accommodate the traffic demand during both peak periods. No side street phase failures were observed during either peak periods, and no mainline phase failures were observed with the following exception:

    - On one occasion, during the afternoon peak period, one southbound phase failure occurred. This occurred as southbound traffic queues from Dunlawton Avenue extended back through Herbert Street, since the signal at Dunlawton Avenue was red for southbound traffic and the signal at Herbert Street was green for southbound traffic. Shortly after the signal at Dunlawton Avenue turned green for southbound traffic, the signal at Herbert Street turned red for southbound traffic causing the phase failure. The green time at Dunlawton Avenue was sufficient to clear the vehicle queue between Dunlawton Avenue and Herbert Street.

- Northbound and southbound U-turning drivers were observed to complete their movement without difficulty. A vehicle as large as a Dodge RAM 2500 was observed to complete the U-turn movement within the available receiving pavement width.

- No conflicts were observed at the intersection during the morning and afternoon peak periods.

- On several occasions during the morning peak period (7:45 to 8:15 AM), vehicle queues from the Dunkin Donuts drive-through extended back near US 1, and occasionally into US 1. No conflicts with northbound vehicles on US 1 were observed as a result of the queuing.

Safety: Vehicle, pedestrian, and bicycle safety at the intersection are assessed through review of crash reports, identification of significant crash trends, then correlation to field conditions. Following are the observations relating to the safety of the intersection.

- Crash data was provided by the Florida Department of Transportation for the intersection of US 1 at Herbert Street for the 12-month period ending June 30, 2010. Two angle collisions, two left turn collisions, one right turn collision, and one backed into collision occurred at the intersection. These collisions resulted in approximately $35,800 property damage.

- Both of the angle collisions involved southbound and eastbound vehicles. One of the collisions occurred when an eastbound driver disregarded the traffic signal and struck a southbound vehicle. The second collision occurred when a southbound driver disregarded the traffic signal and struck an eastbound vehicle. Neither of the collisions resulted in injuries, and both occurred in daylight.

- One of the left turn collisions occurred when a southbound left turning vehicle struck a northbound through vehicle. The collision was a result of failure to yield the right of way, but the at-fault driver could not be determined. The collision resulted in one non-incapacitating injury.

- The other left turn collision occurred when a northbound U-turning driver failed to yield the right of way to a southbound vehicle. No injuries were reported.

- The right turn collision occurred when an eastbound right turning vehicle struck a westbound left turning vehicle that was clearing the intersection.

- The backed into collision occurred in the driveway exiting Dunkin Donuts on to Herbert Street. The cause to this crash was improper backing.

Maintenance: In addition to observing operational and safety conditions, correctible maintenance items are also identified during the field review. Following is a summary of maintenance items observed at the intersection.

- The existing signs and pavement markings are in good condition and properly applied.

4. INTERSECTION ANALYSIS

The purpose of the intersection analysis is to evaluate alternatives that may improve intersection efficiency and safety. Synchro models for the base condition, scoped improvements, and two alternatives were developed for the morning and afternoon peak traffic periods for the current year (2011) and future year (2025) traffic volumes.

The raw turning movement count data for the morning and afternoon peak traffic periods was adjusted to the average week of the year then factored by the peak hour factor for the intersection. Then, the 2025 traffic volumes were developed utilizing a 1.5% growth rate. Table 4 summarizes the volumes developed for the analysis.

Table 4-Design Volumes

Morning Peak Period	Time	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Raw Count Data	7:45 AM	51	5	77	12	1	0	96	727	1	20	567	39
2011 Adjusted to Average Week (inc. PHF)		63	6	95	15	1	0	118	895	1	25	698	48
2025 Average Week		76	7	115	18	1	0	143	1083	1	30	845	58
Afternoon Peak Period		**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Raw Count Data	5:00 PM	69	4	76	8	4	3	95	595	1	5	995	86
2011 Adjusted to Average Week (inc. PHF)		81	5	89	9	5	4	111	695	1	6	1163	100
2025 Average Week		98	6	108	11	6	5	134	841	1	7	1407	121
Peak Hour Factor for Entire Intersection										AM	0.845	PM	0.890
Date of Count							8/24/2011			Average Week Factor			1.04
Linear Growth Rate (per year)						1.5%	from	2011	to	2025	Growth Factor		1.21

The existing signal timings and phasing sequences were obtained from Volusia County Traffic Engineering. This intersection currently operates in coordinated mode throughout the day with the intersection of US 1 and Dunlawton Avenue to the south. The existing Yellow Change, Red Clearance, and Pedestrian Clearance intervals were checked against the requirements in the Traffic Engineering Manual (TEM) and District Five guidelines. Table 5 summarizes the recommended intervals.

Table 5-Recommended Intervals

Phase	1	2	3	4	5	6	7	8
Movement	NBL	SB	N/A	EB/WB	SBL	NB	N/A	N/A
Yellow Change Interval - Existing	4.0	4.0		4.0	4.0	4.0		
Yellow Change Interval - Calculated	4.0	4.0		3.0	4.0	4.0		
Yellow Change Interval - Recommended	4.0	4.0		4.0	4.0	4.0		
Red Clearance Interval - Existing	1.0	2.0		2.0	1.0	2.0		
Red Clearance Interval - Calculated	1.3	1.2		3.5	1.3	1.2		
Red Clearance Interval - Recommended	1.3	2.0		3.5	1.3	2.0		
Pedestrian Clearance Interval - Existing		14.0		26.0		14.0		
Pedestrian Clearance Interval - Calculated		12.0		25.0		12.0		
Pedestrian Clearance Interval - Recommended		14.0		26.0		14.0		

The local controller timing worksheet is included in the appendix.

Base Condition

The existing signal sequence, timings, and geometry were modeled for the morning and afternoon peak traffic periods to establish base operating conditions. The models were calibrated based on existing signal operations with the use of the existing cycle lengths, splits, and offsets. Due the proximity of Dunlawton Avenue to the south, the analysis of Herbert Street includes both intersections. Currently, there is a single coordinated plan that runs from 6:30 AM to 8:00 PM on weekdays and consists of a 160 second

Alternative 1 (Scoped Improvements)

Alternative 1 includes the addition of a southbound right turn lane, an eastbound right turn lane, and the extension of the northbound and southbound left turn lanes. Northbound and southbound bike lanes will also be added along both sides of US 1. To implement these changes, the traffic separators on US 1 will be shifted, and the northbound and southbound lanes will be narrowed. The existing signal timings were used in Alternative 1. A portion of the existing on-street parking will need to be removed to accommodate these improvements. Curb cut ramp modifications are also included with the scoped improvements.

Alternative 2

Alternative 2 includes the improvements in Alternative 1 and the development of optimized coordinated signal timings for Herbert Street and Dunlawton Avenue. The timings developed include separate cycle lengths for the 2011 and 2025 volumes for both the morning peak period and the afternoon peak period.

Alternative 3

The receiving pavement and median width will be reduced for the southbound U-turn movement due to the scoped improvements described above, while the receiving pavement width for the northbound U-turn movement will be increased. With the reduction in receiving pavement (approximately 31 feet to 26 feet) and median width (approximately 20 feet to 16 feet) for the southbound U-turn movement, passenger vehicles will not be able to complete U-turn movements, based on the FDOT Median Handbook and the AASHTO minimum turning paths. In lieu of southbound U-turn movements using a portion of the east approach to complete their U-turn movements, which is not desirable, southbound U-turn movements would need to be restricted. This can be accomplished by providing an overhead span wire mounted "No U-turn" sign. Southbound U-turn volumes at Herbert Street are light with a total of eighteen U-turns during the eight hour count period.

Alternative 3 includes the improvements in Alternative 2, restricts southbound U-turn movements, and reassigns southbound U-turn movements from Herbert Street to the southbound left turn movement at Dunlawton Avenue, where the scoped improvements do not reduce the receiving pavement width for U-turn movements.

Alternative 4

Alternative 4 includes the addition of an eastbound right turn lane only. The development of optimized coordinated signal timings for Herbert Street and Dunlawton Avenue were included with this alternative. This alternative also includes lane reductions to accommodate a southbound bike lane on the south approach of US 1. Bike lanes can be added on US 1 approaching Herbert Street and departing Herbert Street northbound without narrowing the existing lane widths.

The following table summarizes the results of the Synchro analysis. Synchro reports for each alternative are included in the appendix.

Table 6-Alternatives Comparison

Morning Peak Period	Intersection LOS	Intersection Delay (Sec/Veh)	SB Approach Delay (Sec/Veh)	EB Approach Delay (Sec/Veh)
Base Condition 2011	B	17.0	8.5	85.5
Alternative 1 (Scoped Improvements) - 2011	B	12.5	6.6	48.7
Alternative 2 - 2011	A	10.0	7.5	39.6
Alternative 3 - 2011	A	10.0	7.5	39.6
Alternative 4 - 2011	A	10.1	7.7	39.6
Base Condition (No Build) 2025	B	19.4	10.0	98.6
Alternative 1 (Scoped Improvements) - 2025	B	13.6	7.9	48.4
Alternative 2 - 2025	B	10.2	8.1	44.0
Alternative 3 - 2025	B	10.2	8.1	44.0
Alternative 4 - 2025	A	10.0	8.5	44.0
Afternoon Peak Period				
Base Condition 2011	B	17.6	11.5	96.6
Alternative 1 (Scoped Improvements) - 2011	B	12.6	9.1	54.4
Alternative 2 - 2011	B	11.2	10.0	45.2
Alternative 3 - 2011	B	11.2	10.0	45.2
Alternative 4 - 2011	B	11.6	10.7	45.2
Base Condition (No Build) 2025	C	22.1	14.7	119.1
Alternative 1 (Scoped Improvements) - 2025	B	14.8	11.4	56.0
Alternative 2 - 2025	B	12.3	11.6	51.8
Alternative 3 - 2025	B	12.4	11.7	51.8
Alternative 4 - 2025	B	13.2	12.7	51.8

Review of the results for the current and future year traffic volumes indicates that the addition of an eastbound right turn lane will be beneficial to the operation of the intersection. Alternatives 2 and 3 show the best measures of effectiveness in terms of delay and level of service (LOS). Alternative 4 shows improvements over the base condition for all periods modeled as well. The eastbound delay for all of the alternatives and periods modeled is significantly reduced when compared to the Base Condition. The addition of the southbound right turn lane does not significantly improve the southbound delay over the Base Condition. The addition of a southbound right turn lane will require the restriction of southbound U-turn movements. There is the possibility for an increase in southbound U-turn movements due to the potential for future development northeast of the intersection, so southbound U-turn movements should not be restricted. Alternative 4 is recommended.

Since a southbound right turn lane is not recommended, the north and south approach medians will not need to be reconstructed to accommodate the widening. Since the mainline left turn lanes do not meet standards, the mainline left turn lanes could be extended. Bike lanes could be added along US 1 without impacting the operation of the intersection. Lane reductions would be needed to accommodate a southbound bike lane approaching Dunlawton Avenue. Bike lanes can be added on US 1 approaching Herbert Street and departing Herbert Street northbound without narrowing the existing lane widths.

With the implementation of Alternative 4, the LOS of the intersection is B or better during both peak traffic periods modeled utilizing both the current and future year traffic volumes. As such, additional capacity/phasing modifications to this intersection are not needed.

5. RECOMMENDATIONS

Based on the results of the analysis, field observations, and engineering judgment, the following recommendations are made:

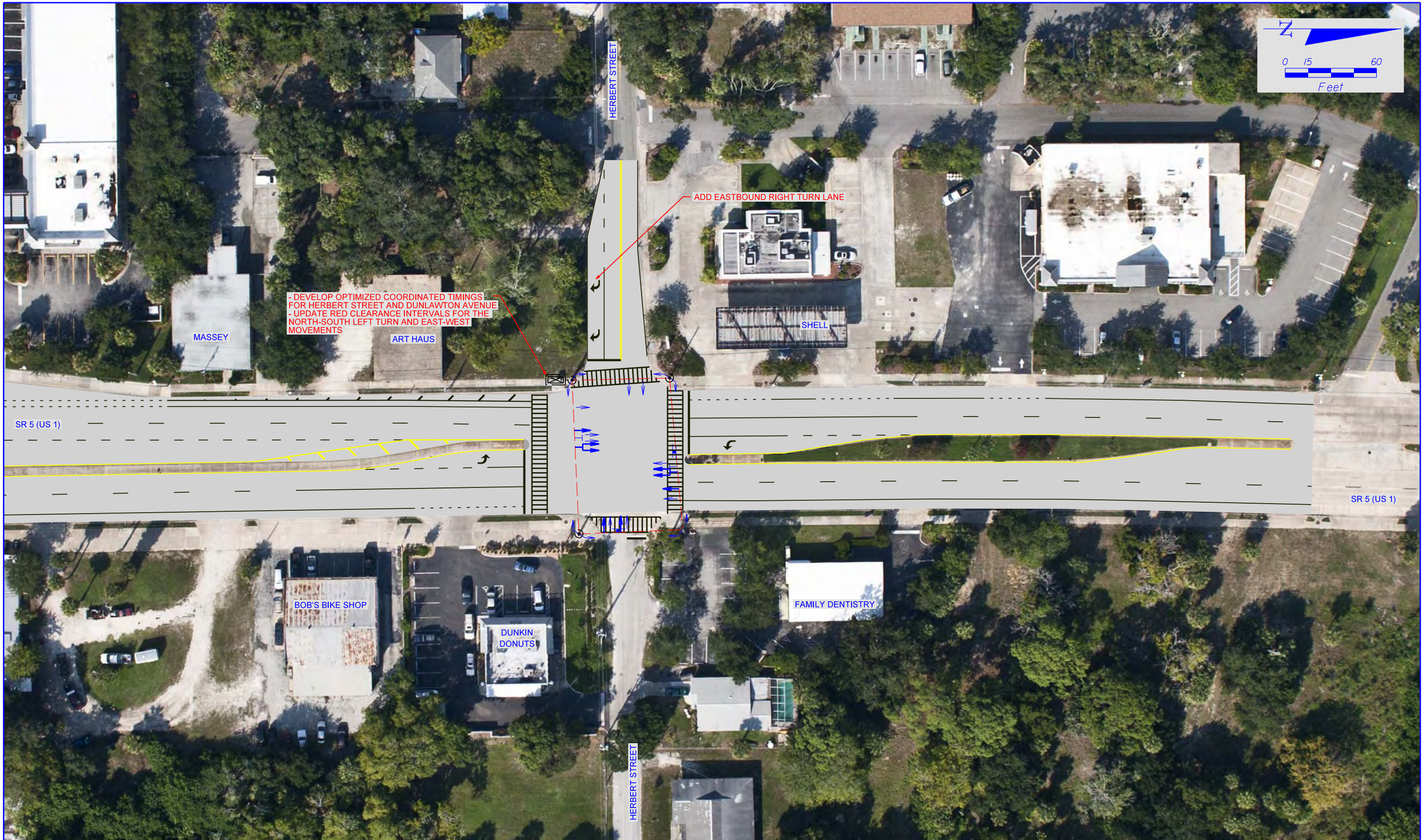
1. Providing a southbound right turn lane, as recommended in the AIS, will result in minimal improvement to intersection delay over the no build condition in current and future years. Southbound U-turn movements would need to be restricted with this improvement. As such, a southbound right turn lane is not recommended, and the north and south approach medians will not need to be reconstructed to accommodate the widening. Since the existing mainline left turn lanes do not meet standards, the mainline left turn lanes could be extended. The addition of an eastbound right turn lane significantly reduces eastbound approach delay at the intersection. Alternative 4 is recommended, which includes the addition of eastbound right turn lane and the development of coordinated timings between the intersection of Dunlawton Avenue and Herbert Street. Bike lanes could be added along US 1 as recommended in the AIS without impacting the existing operations.

2. The existing intersection operates efficiently under current traffic conditions. The addition of an eastbound right turn lane will be beneficial to the operation of the intersection in the future.

3. Optimized coordination timings should be developed for Herbert Street and Dunlawton Avenue after the recommended improvements have been constructed.

4. The red clearance intervals should be increased for the north-south left turn and east-west movements per Table 5.

A conceptual improvement diagram has been developed to further depict the recommended improvements and is included on the following page.



CONTROLLER CABINET	DELINEATOR	DITCH BOTTOM INLET	GUARDRAIL	
TRAFFIC SIGNAL POLE	POWER POLE	MANHOLE	FENCE	
SIGNAL HEAD	LIGHT POLE	MITERED END SECTION	TREE/SHRUB	
SIGN	HYDRANT	DRAINAGE INLET	BUILDING	

Faller, Davis & Associates, Inc.

FIGURE 4
CONCEPTUAL IMPROVEMENT DIAGRAM
CONTINUING SERVICES FOR TRAFFIC OPERATIONS

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APPENDIX

North Approach Photographs

Looking south into the intersection along US 1

Looking north from the intersection along US 1

South Approach Photographs

Looking north into the intersection along US 1

Looking south from the intersection along US 1

East Approach Photographs

Looking west into the intersection along Herbert Street

Looking east from the intersection along Herbert Street

West Approach Photographs

Looking east into the intersection along Herbert Street

Looking west from the intersection along Herbert Street

TURNING MOVEMENT COUNT
NORTH STREET: SR 5 (US 1)
SOUTH STREET: SR 5 (US 1)
SR 5 (US 1) at Herbert Street
ALL VEHICLES

DATE: 8/18/11 and 8/24/11
EAST STREET: Herbert Street
WEST STREET: Herbert Street
TIME: 7:00 AM - 9:00 AM, 11:00 AM to 1:00 PM and 2:00 PM - 6:00 PM
BY: FDA

START	NORTHBOUND					SOUTHBOUND						EASTBOUND					WESTBOUND						GRAND
TIME	LEFT	THRU	RIGHT	U-TURN	TOTAL	LEFT	THRU	RIGHT	U-TURN	TOTAL	NS TOTAL	LEFT	THRU	RIGHT	U-TURN	TOTAL	LEFT	THRU	RIGHT	U-TURN	TOTAL	EW TOTAL	TOTAL
7:00	14	102	1	4	121	1	71	7	0	79	200	2	1	11	0	14	2	0	1	0	3	17	217
7:15	15	122	1	5	143	2	91	6	2	101	244	9	1	10	0	20	1	0	0	0	1	21	265
7:30	22	150	0	5	177	1	97	3	1	102	279	18	0	13	0	31	1	0	2	0	3	34	313
7:45	15	174	0	3	192	2	140	13	0	155	347	15	2	10	0	27	2	0	0	0	2	29	376
Total	**66**	**548**	**2**	**17**	**633**	**6**	**399**	**29**	**3**	**437**	**1,070**	**44**	**4**	**44**	**0**	**92**	**6**	**0**	**3**	**0**	**9**	**101**	**1,171**
8:00	19	174	0	0	193	5	148	7	0	160	353	14	2	25	0	41	4	0	0	0	4	45	398
8:15	13	165	0	5	183	4	118	7	0	129	312	15	0	19	0	34	4	0	0	0	4	38	350
8:30	29	214	1	12	256	9	161	12	0	182	438	7	1	23	0	31	2	1	0	0	3	34	472
8:45	14	165	1	2	182	3	122	15	1	141	323	6	0	16	0	22	4	0	1	0	5	27	350
Total	**75**	**718**	**2**	**19**	**814**	**21**	**549**	**41**	**1**	**612**	**1,426**	**42**	**3**	**83**	**0**	**128**	**14**	**1**	**1**	**0**	**16**	**144**	**1,570**
11:00	15	137	1	1	154	7	153	14	1	175	329	16	2	9	0	27	4	2	2	0	8	35	364
11:15	13	157	2	0	172	0	166	12	1	179	351	21	1	20	0	42	5	1	1	0	7	49	400
11:30	13	144	0	4	161	7	168	12	1	188	349	15	1	26	0	42	4	0	3	0	7	49	398
11:45	15	111	0	4	130	0	201	18	1	220	350	19	0	10	0	29	2	0	0	0	2	31	381
Total	**56**	**549**	**3**	**9**	**617**	**14**	**688**	**56**	**4**	**762**	**1,379**	**71**	**4**	**65**	**0**	**140**	**15**	**3**	**6**	**0**	**24**	**164**	**1,543**
12:00	17	146	0	1	164	1	157	13	1	172	336	15	2	21	0	38	2	0	1	0	3	41	377
12:15	15	128	1	3	147	3	155	9	0	167	314	10	1	7	0	18	3	2	0	0	5	23	337
12:30	25	121	1	0	147	2	155	9	3	169	316	18	0	15	0	33	3	0	0	0	3	36	352
12:45	15	98	0	1	114	1	171	16	0	188	302	20	2	18	0	40	2	0	0	0	2	42	344
Total	**72**	**493**	**2**	**5**	**572**	**7**	**638**	**47**	**4**	**696**	**1,268**	**63**	**5**	**61**	**0**	**129**	**10**	**2**	**1**	**0**	**13**	**142**	**1,410**
14:00	12	111	0	5	128	0	183	9	0	192	320	14	0	24	0	38	1	1	2	0	4	42	362
14:15	8	70	0	1	79	0	124	8	0	132	211	19	1	4	0	24	0	0	1	0	1	25	236
14:30	12	81	1	5	99	0	142	8	0	150	249	11	1	15	0	27	1	0	2	0	3	30	279
14:45	10	91	0	2	103	1	140	7	2	150	253	6	2	10	0	18	3	1	2	0	6	24	277
Total	**42**	**353**	**1**	**13**	**409**	**1**	**589**	**32**	**2**	**624**	**1,033**	**50**	**4**	**53**	**0**	**107**	**5**	**2**	**7**	**0**	**14**	**121**	**1,154**
15:00	13	121	0	4	138	6	173	17	0	196	334	14	0	15	0	29	2	1	1	0	4	33	367
15:15	11	87	0	4	102	3	144	18	0	165	267	9	0	13	0	22	0	0	0	0	0	22	289
15:30	10	123	0	7	140	2	193	8	1	204	344	9	0	22	0	31	1	0	2	0	3	34	378
15:45	13	148	1	1	163	3	244	12	1	260	423	23	0	20	0	43	2	0	1	0	3	46	469
Total	**47**	**479**	**1**	**16**	**543**	**14**	**754**	**55**	**2**	**825**	**1,368**	**55**	**0**	**70**	**0**	**125**	**5**	**1**	**4**	**0**	**10**	**135**	**1,503**
16:00	14	159	1	2	176	1	215	12	0	228	404	10	0	7	0	17	0	0	5	0	5	22	426
16:15	21	156	1	2	180	0	249	14	0	263	443	13	1	26	0	40	3	0	2	0	5	45	488
16:30	24	160	1	5	190	0	234	20	1	255	445	18	2	32	0	52	2	0	1	0	3	55	500
16:45	19	117	2	6	144	0	237	30	0	267	411	22	0	13	0	35	3	0	2	0	5	40	451
Total	**78**	**592**	**5**	**15**	**690**	**1**	**935**	**76**	**1**	**1,013**	**1,703**	**63**	**3**	**78**	**0**	**144**	**8**	**0**	**10**	**0**	**18**	**162**	**1,865**
17:00	34	143	0	2	179	0	213	21	0	234	413	14	0	9	2	25	2	2	2	0	6	31	444
17:15	17	134	0	1	152	2	263	26	0	291	443	13	1	23	0	37	2	1	0	0	3	40	483
17:30	20	190	1	1	212	1	280	15	1	297	509	12	0	22	0	34	1	1	0	0	2	36	545
17:45	16	128	0	4	148	1	239	24	0	264	412	28	3	22	0	53	3	0	1	0	4	57	469
Total	**87**	**595**	**1**	**8**	**691**	**4**	**995**	**86**	**1**	**1,086**	**1,777**	**67**	**4**	**76**	**2**	**149**	**8**	**4**	**3**	**0**	**15**	**164**	**1,941**

FLORIDA DEPARTMENT OF TRANSPORTATION

SUMMARY OF VEHICLE MOVEMENTS

SECTION 79010 **CITY** Port Orange **COUNTY** Volusia

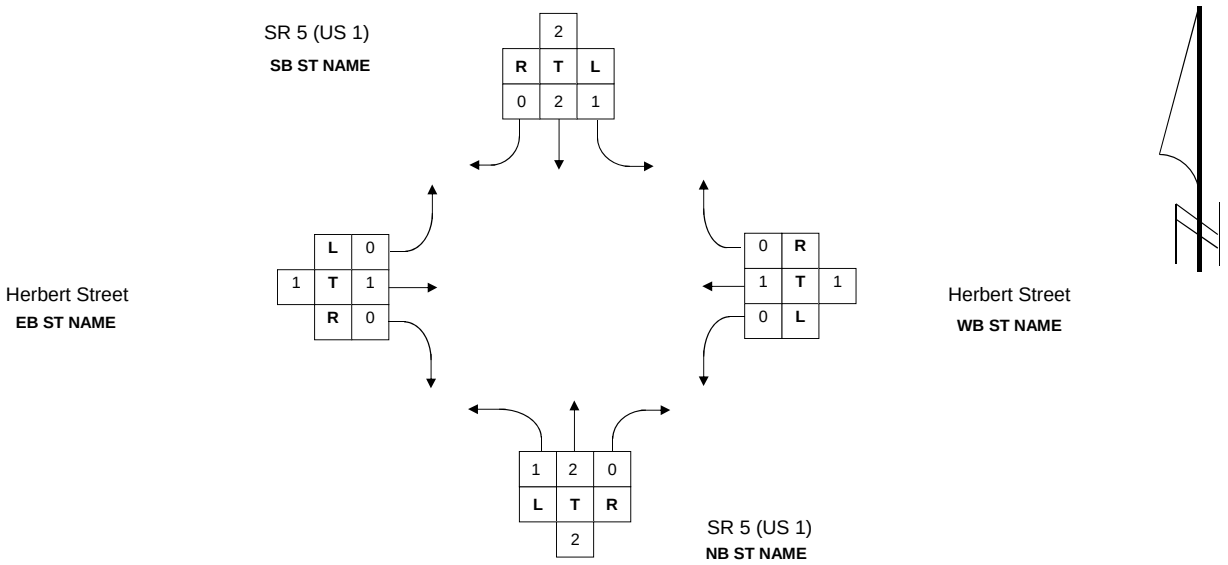
MAIN STREET SR 5 (US 1) **INTERSECTING ROUTE** Herbert Street

OBSERVER FDA **DATE** 8/18/11 and 8/24/11 **MILEPOST** 27.720

WEATHER Fair **ROAD CONDITION** Good

REMARKS

FORM COMPLETED BY GEP **DATE** 08/31/11



TIME	NORTHBOUND					SOUTHBOUND					TOTAL	EASTBOUND					WESTBOUND					TOTAL
BEGIN/END	LEFT	THRU	RIGHT	U-TURN	TOT	LEFT	THRU	RIGHT	U-TURN	TOT	N/S	LEFT	THRU	RIGHT	U-TURN	TOT	LEFT	THRU	RIGHT	U-TURN	TOT	E/W
4 - 5																						
5 - 6																						
6 - 7																						
7 - 8	66	548	2	17	**633**	6	399	29	3	**437**	**1,070**	44	4	44	0	**92**	6	0	3	0	**9**	**101**
8 - 9	75	718	2	19	**814**	21	549	41	1	**612**	**1,426**	42	3	83	0	**128**	14	1	1	0	**16**	**144**
9 - 10																						
10 - 11																						
11 - 12	56	549	3	9	**617**	14	688	56	4	**762**	**1,379**	71	4	65	0	**140**	15	3	6	0	**24**	**164**
12 - 1	72	493	2	5	**572**	7	638	47	4	**696**	**1,268**	63	5	61	0	**129**	10	2	1	0	**13**	**142**
1 - 2																						
2 - 3	42	353	1	13	**409**	1	589	32	2	**624**	**1,033**	50	4	53	0	**107**	5	2	7	0	**14**	**121**
3 - 4	47	479	1	16	**543**	14	754	55	2	**825**	**1,368**	55	0	70	0	**125**	5	1	4	0	**10**	**135**
4 - 5	78	592	5	15	**690**	1	935	76	1	**1,013**	**1,703**	63	3	78	0	**144**	8	0	10	0	**18**	**162**
5 - 6	87	595	1	8	**691**	4	995	86	1	**1,086**	**1,777**	67	4	76	2	**149**	8	4	3	0	**15**	**164**
6 - 7																						
7 - 8																						
8 - 9																						
9 - 10																						
10 - 11																						
11 - 12																						
TOTAL	523	4,327	17	102	**4,969**	68	5,547	422	18	**6,055**	**11,024**	455	27	530	2	**1,014**	71	13	35	0	**119**	**1,133**

Percentage	11%	87%	0%	2%		1%	92%	7%	0%			45%	3%	52%	0%		60%	11%	29%	0%		
Maximum	87	718	5	19		21	995	86	4			71	5	83	2		15	4	10	0		
Minimum	42	353	1	5		1	399	29	1			42	0	44	0		5	0	1	0		

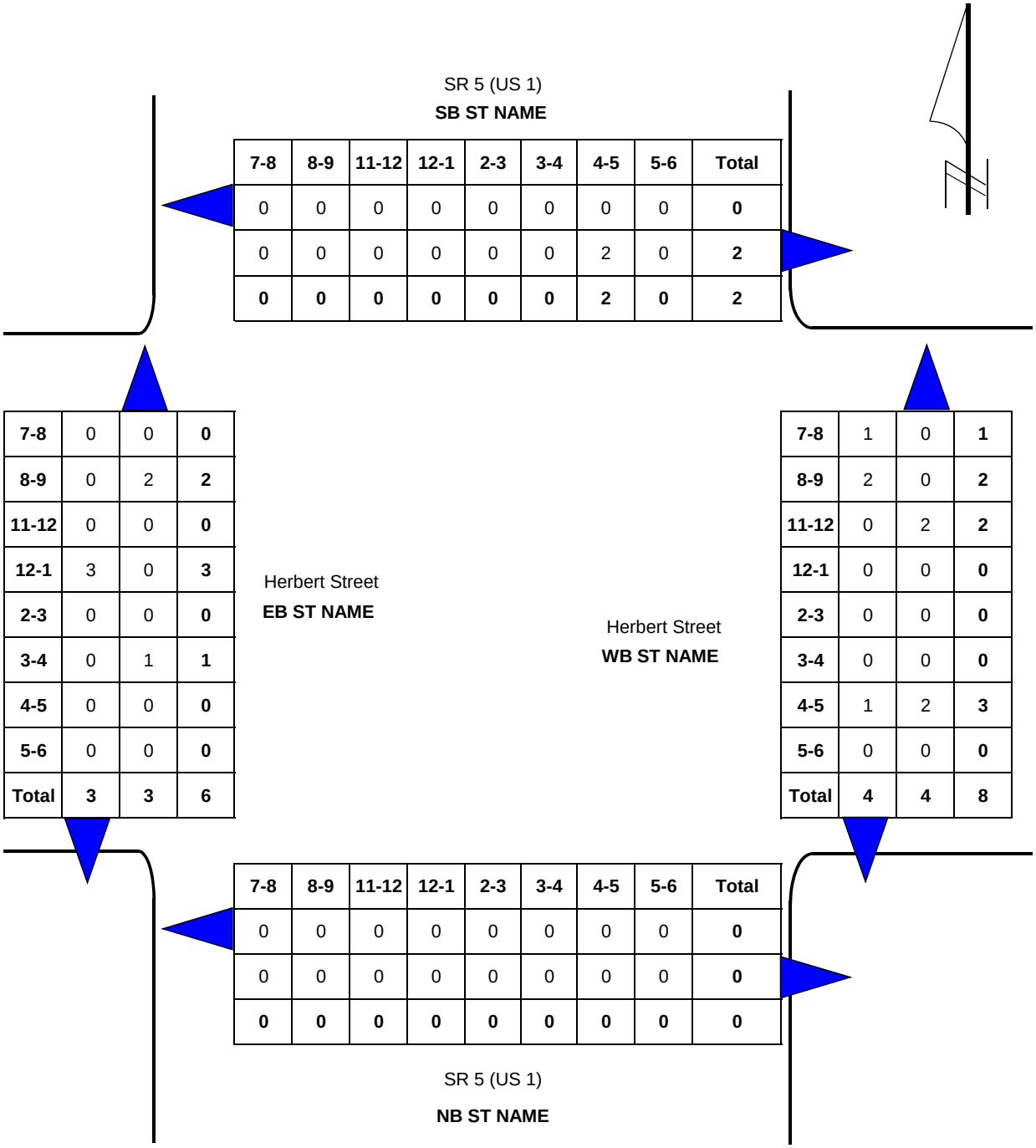
FLORIDA DEPARTMENT OF TRANSPORTATION

PEDESTRIAN MOVEMENT SUMMARY

SECTION 79010 **CITY** Port Orange **COUNTY** Volusia
STATE ROUTE SR 5 (US 1) **INTERSECTING ROUTE** Herbert Street
OBSERVER FDA **DATE** 8/18/11 and 8/24/11 **MILEPOST** 27.720

REMARKS

FORM COMPLETED BY GEP **DATE** 08/31/11



7-8	8-9	11-12	12-1	2-3	3-4	4-5	5-6	Total
0	0	0	0	0	0	0	0	**0**
0	0	0	0	0	0	2	0	**2**
0	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**

7-8	0	0	**0**
8-9	0	2	**2**
11-12	0	0	**0**
12-1	3	0	**3**
2-3	0	0	**0**
3-4	0	1	**1**
4-5	0	0	**0**
5-6	0	0	**0**
Total	**3**	**3**	**6**

7-8	1	0	**1**
8-9	2	0	**2**
11-12	0	2	**2**
12-1	0	0	**0**
2-3	0	0	**0**
3-4	0	0	**0**
4-5	1	2	**3**
5-6	0	0	**0**
Total	**4**	**4**	**8**

7-8	8-9	11-12	12-1	2-3	3-4	4-5	5-6	Total
0	0	0	0	0	0	0	0	**0**
0	0	0	0	0	0	0	0	**0**
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

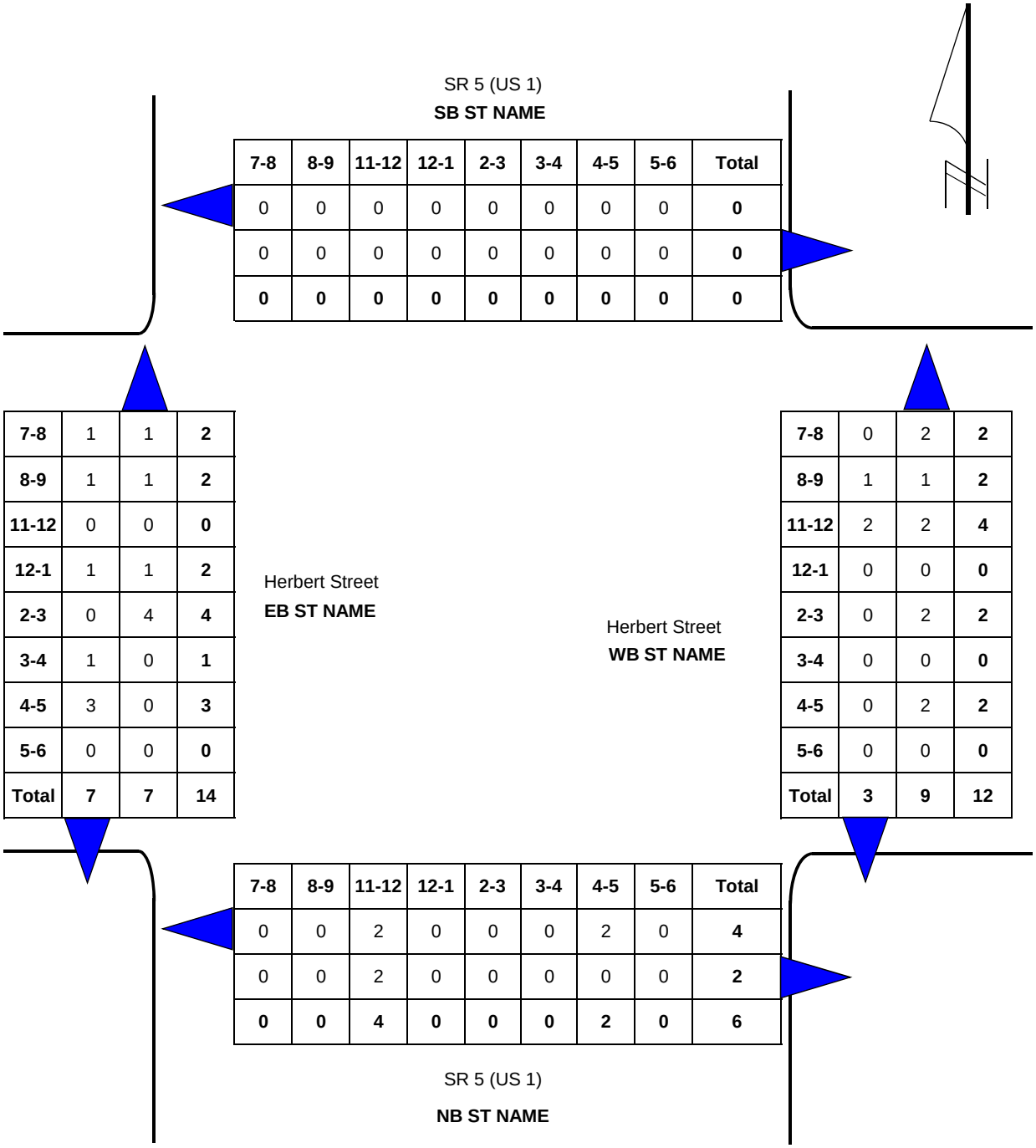
FLORIDA DEPARTMENT OF TRANSPORTATION

BICYCLE MOVEMENT SUMMARY

SECTION 79010 **CITY** Port Orange **COUNTY** Volusia
STATE ROUTE SR 5 (US 1) **INTERSECTING ROUTE** Herbert Street
OBSERVER FDA **DATE** 8/18/11 and 8/24/11 **MILEPOST** 27.720

REMARKS

FORM COMPLETED BY GEP **DATE** 08/31/11

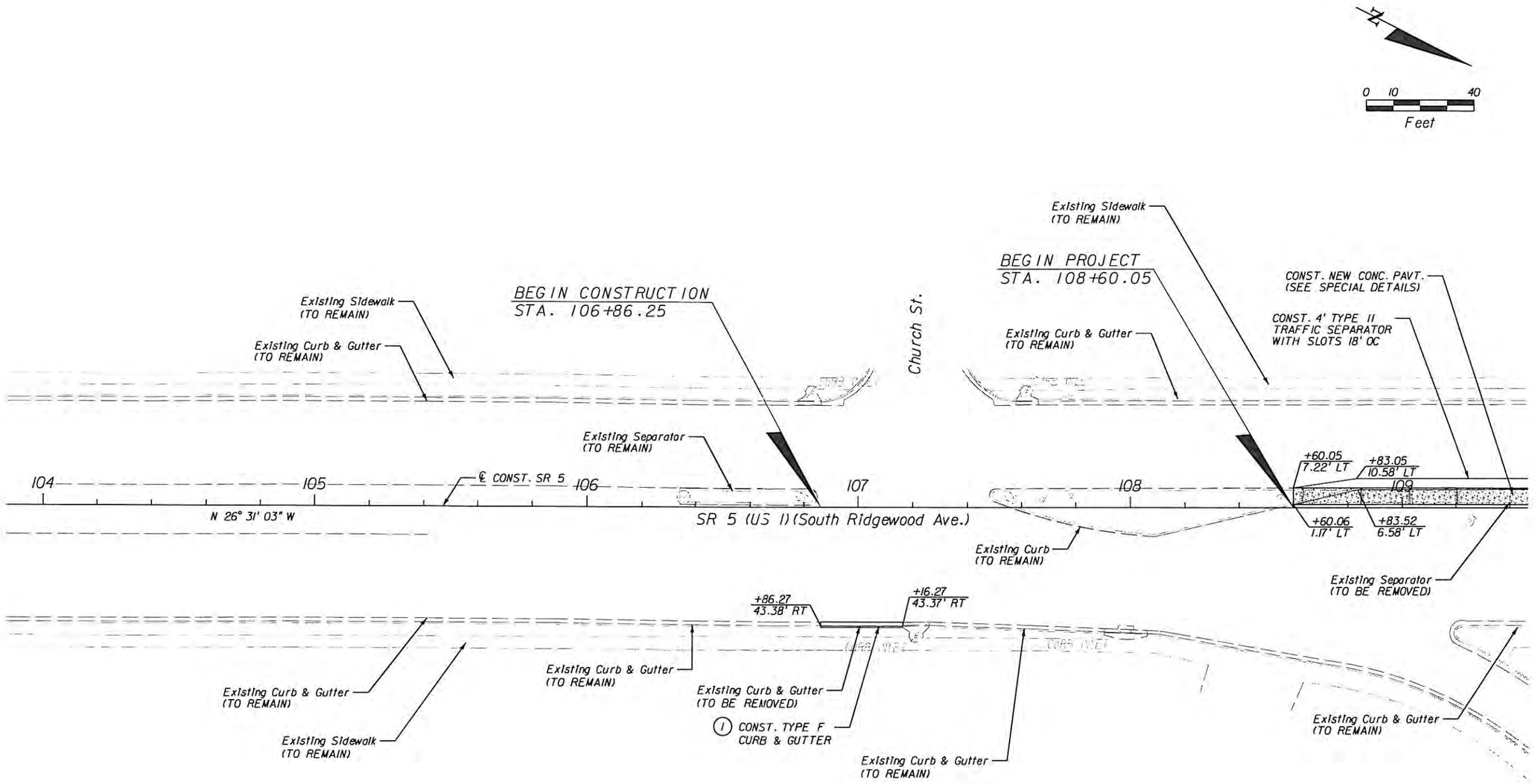


7-8	8-9	11-12	12-1	2-3	3-4	4-5	5-6	Total
0	0	0	0	0	0	0	0	**0**
0	0	0	0	0	0	0	0	**0**
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

7-8	1	1	**2**
8-9	1	1	**2**
11-12	0	0	**0**
12-1	1	1	**2**
2-3	0	4	**4**
3-4	1	0	**1**
4-5	3	0	**3**
5-6	0	0	**0**
Total	**7**	**7**	**14**

7-8	0	2	**2**
8-9	1	1	**2**
11-12	2	2	**4**
12-1	0	0	**0**
2-3	0	2	**2**
3-4	0	0	**0**
4-5	0	2	**2**
5-6	0	0	**0**
Total	**3**	**9**	**12**

7-8	8-9	11-12	12-1	2-3	3-4	4-5	5-6	Total
0	0	2	0	0	0	2	0	**4**
0	0	2	0	0	0	0	0	**2**
0	**0**	**4**	**0**	**0**	**0**	**2**	**0**	**6**



(1) PRIOR TO CONSTRUCTING THE CURB AND GUTTER, THE CONTRACTOR SHALL FILL ANY VOID UNDER THE CONCRETE PAVEMENT WITH FLOWABLE FILL.

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

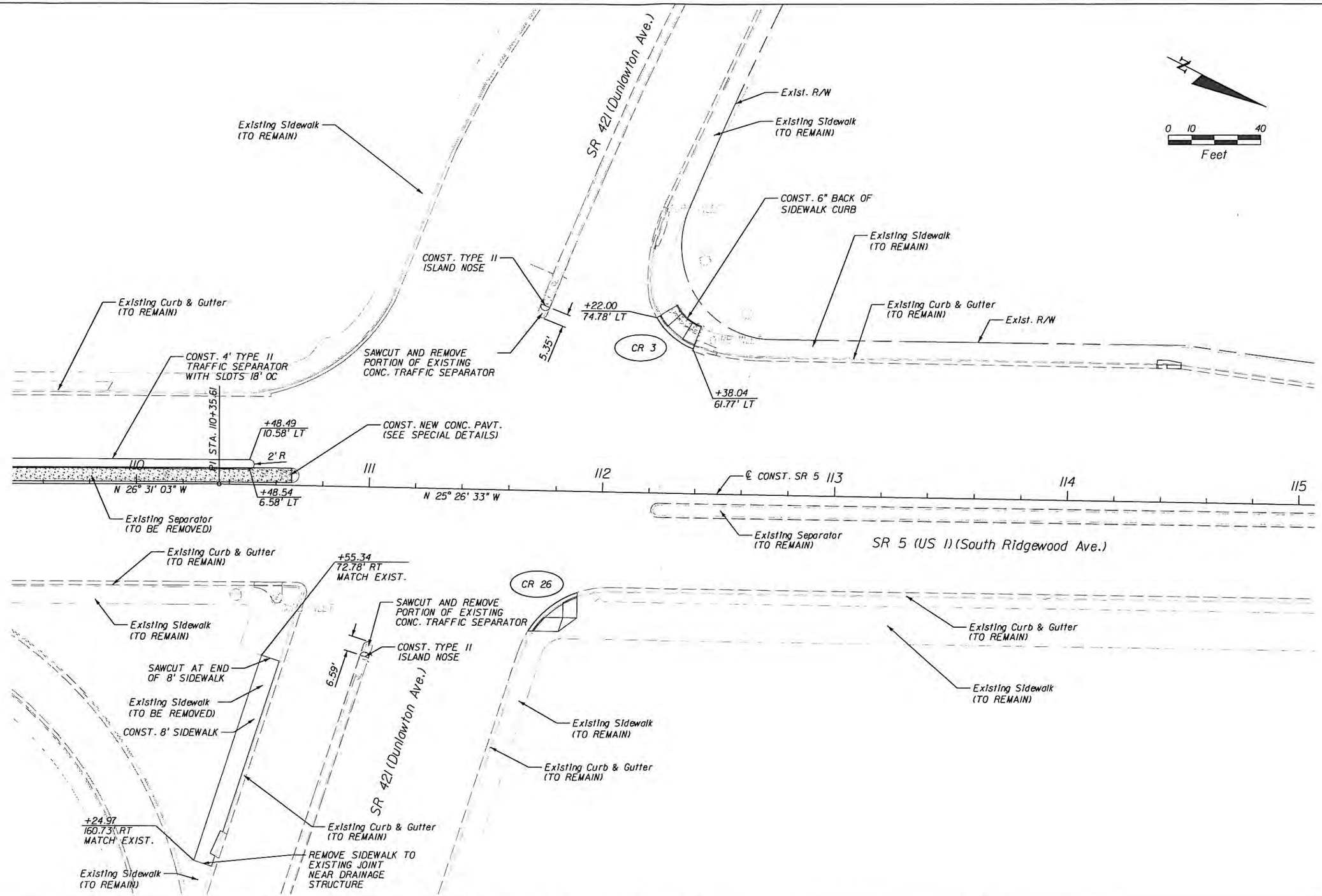
moffatt & nichol
MOFFATT & NICHOL
1025 GREENWOOD BLVD, STE 371
LAKE MARY, FL 32746
(407) 562-2030
CERT. OF AUTH. NO. 4877
ENGINEER OF RECORD: JEFFREY A. MESSENGER, PE
FL REGISTRATION NO. 57539

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	VOLUSIA	240992-2-52-01

PLAN SHEET

SHEET NO. 10



NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

moffatt & nichol
MOFFATT & NICHOL
1025 GREENWOOD BLVD, STE 371
LAKE MARY, FL 32746
(407) 562-2030
CERT. OF AUTH. NO. 4877

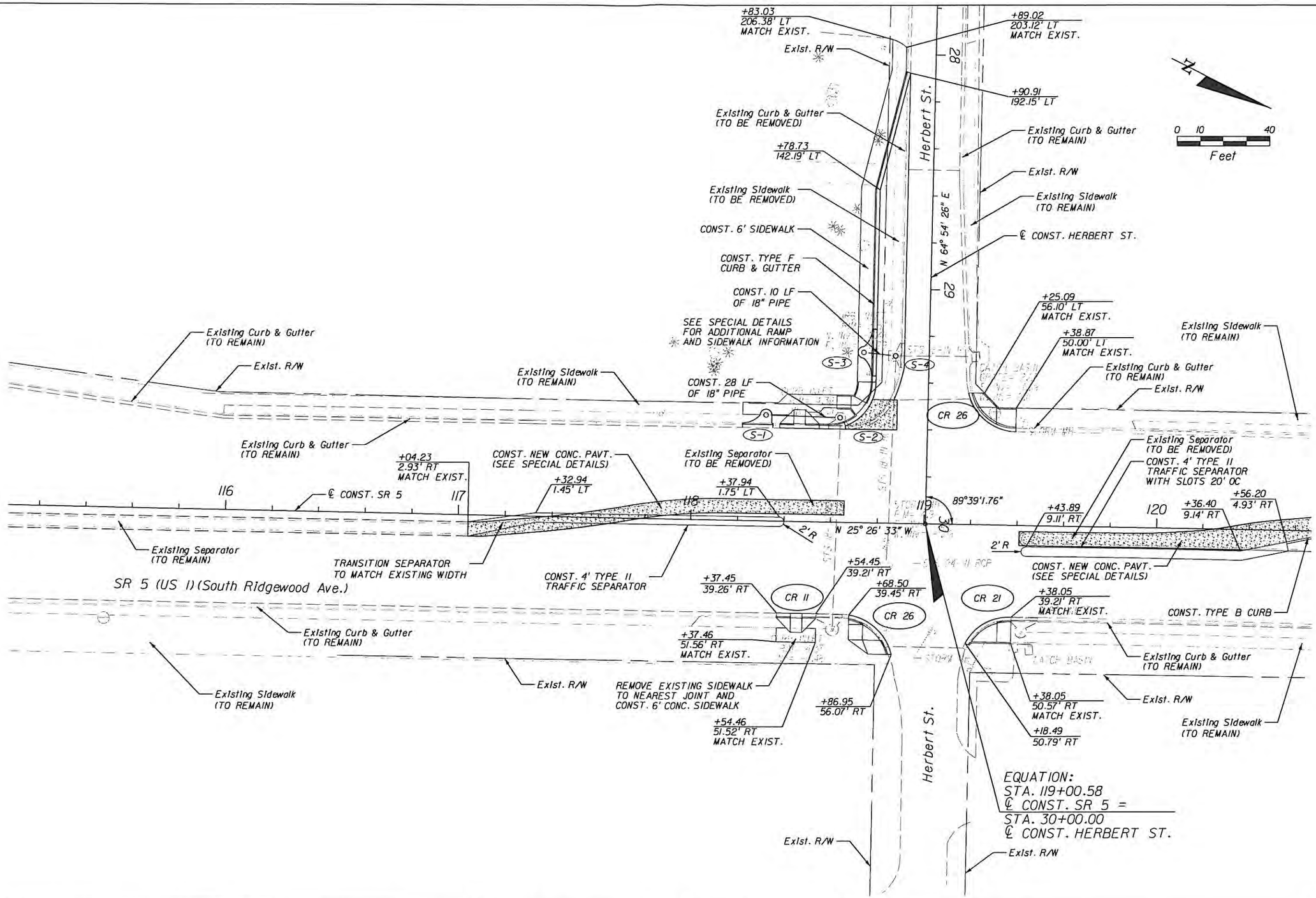
ENGINEER OF RECORD: JEFFREY A. MESSENGER, PE
FL REGISTRATION NO. 57539

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	VOLUSIA	240992-2-52-01

PLAN SHEET

SHEET NO. 11



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

moffatt & nichol
MOFFATT & NICHOL
1025 GREENWOOD BLVD, STE 371
LAKE MARY, FL 32746
(407) 562-2030
CERT. OF AUTH. NO. 4877

ENGINEER OF RECORD: JEFFREY A. MESSENGER, PE
FL REGISTRATION NO. 57539

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	VOLUSIA	240992-2-52-01

PLAN SHEET

SHEET NO. 12

jtom 4/8/2011 1:52:09 PM P:\7287-US1-Dunlawton\240992252\01\roadway\PLANRD03.DGN

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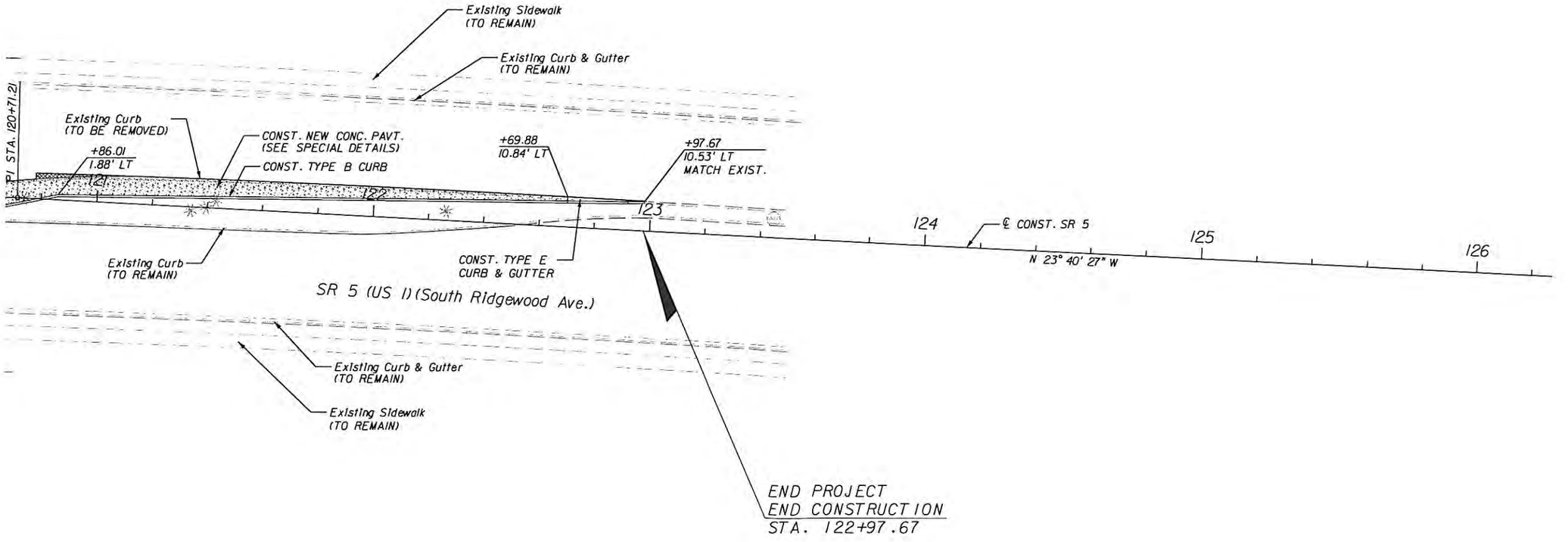


NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

moffatt & nichol
MOFFATT & NICHOL
1025 GREENWOOD BLVD, STE 371
LAKE MARY, FL 32746
(407) 562-2030
CERT. OF AUTH. NO. 4877
ENGINEER OF RECORD: JEFFREY A. MESSENGER, PE
FL REGISTRATION NO. 57539

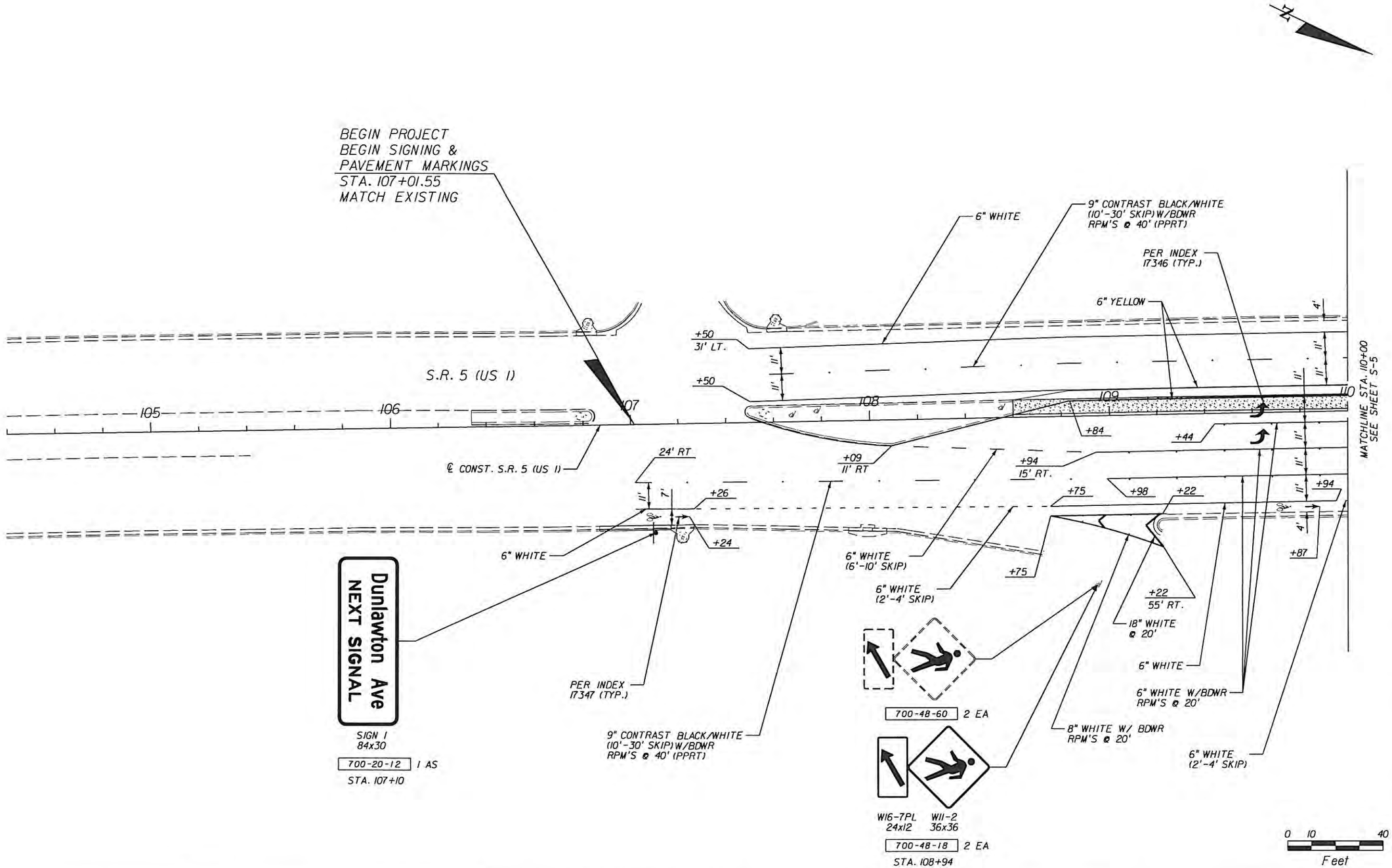
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	VOLUSIA	240992-2-52-01

PLAN SHEET

SHEET NO. 13

jtcm 4/8/2011 1:52:11 PM P:\7287 USI-Dunlawton\240992520I\roadway\PLANRD04.DGN



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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

proltelan design group
CERTIFICATE OF AUTHORIZATION NUMBER 7865
100 EAST PINE STREET, SUITE 600
ORLANDO FLORIDA 32801
PHONE (407) 246-0044
SCOTT G. HORLANDER, P.E. No. 46624

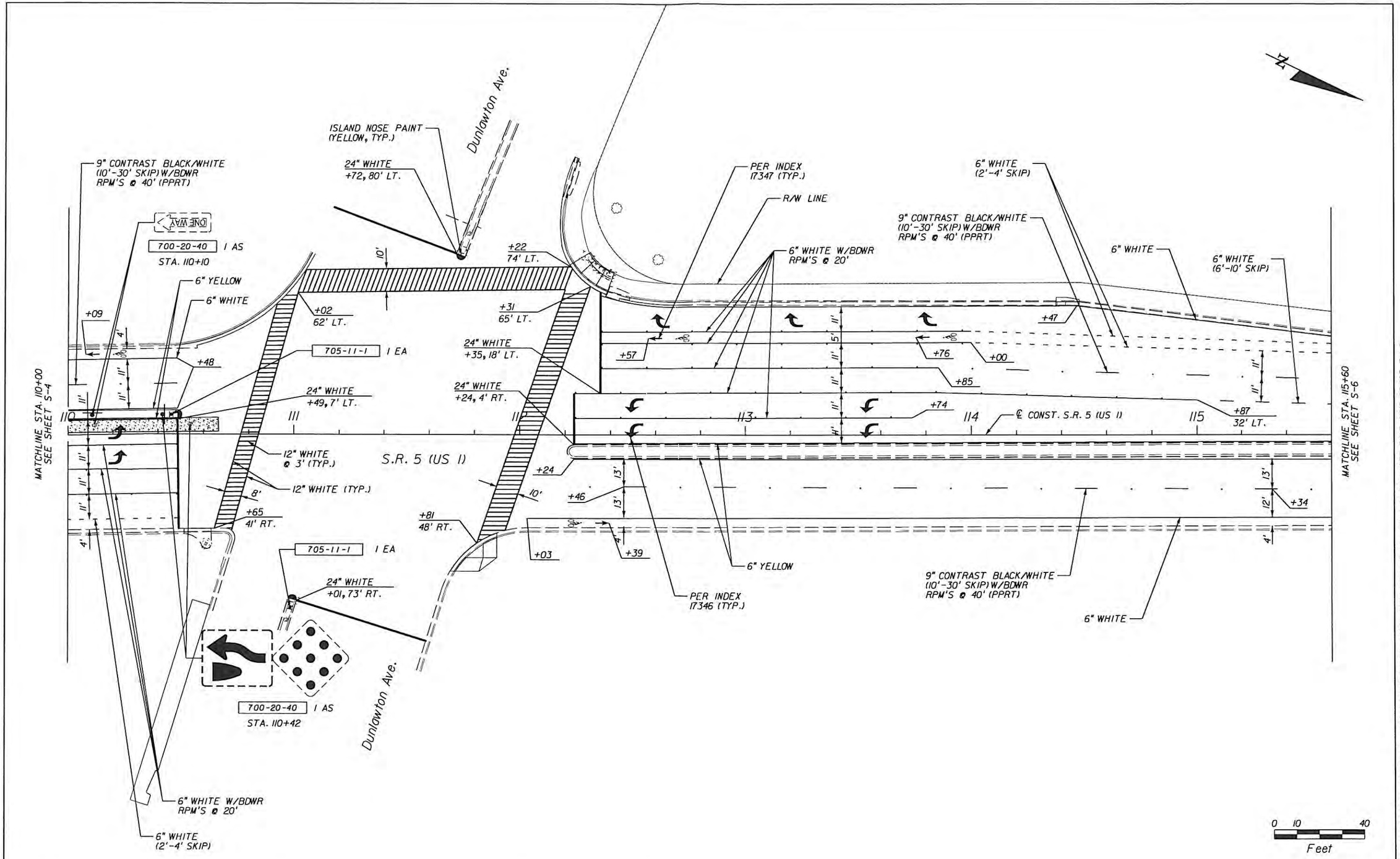
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	VOLUSIA	240992-2-52-01

SIGNING & MARKING PLAN

SHEET NO. S-4

jmessenger 4/12/2011 1:08:27 PM P:\7287-US1-Dunlawton\240992252G1\signing\PLANSP01.DGN



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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

proltelan design group
CERTIFICATE OF AUTHORIZATION NUMBER 7865
100 EAST PINE STREET, SUITE 600
ORLANDO FLORIDA 32801
PHONE (407) 246-0044
SCOTT G. HORLANDER, P.E. NO. 46624

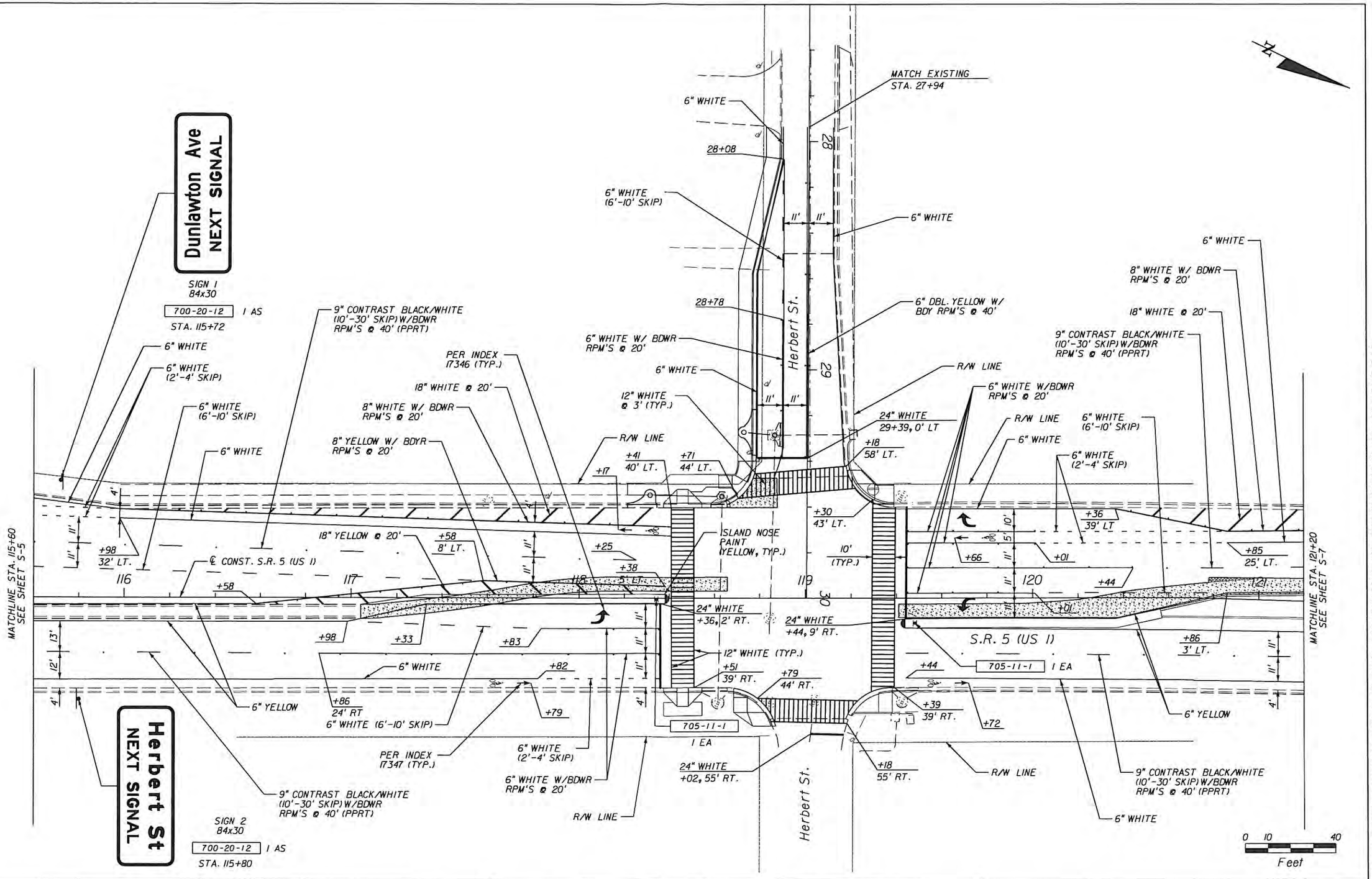
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	VOLUSIA	240992-2-52-01

SIGNING & MARKING PLAN

SHEET NO. S-5

jmessenger 4/12/2011 1:08:28 PM P:\7287-US1-Dunlawton\240992520I\signing\PLANSP02.DGN



NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

proltelan design group
CERTIFICATE OF AUTHORIZATION NUMBER 7865
100 EAST PINE STREET, SUITE 600
ORLANDO FLORIDA 32801
PHONE (407) 246-0044
SCOTT G. HORLANDER, P.E. NO. 46624

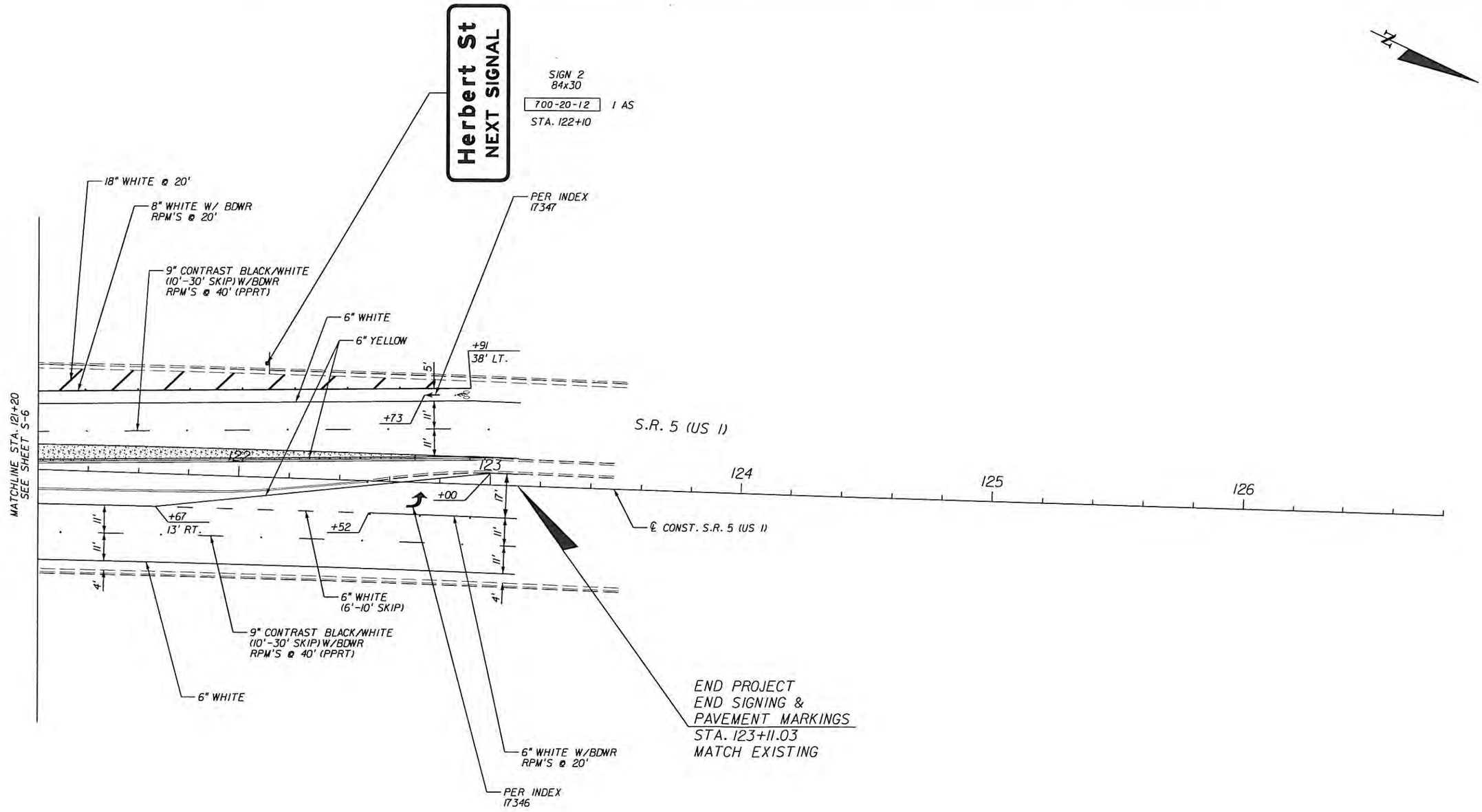
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	VOLUSIA	240992-2-52-01

SIGNING & MARKING PLAN

SHEET NO. S-6

jmessenger 4/12/2011 1:08:30 PM P:\7287-USI-Dunlawton\240992252201\signing\PLANSP03.DGN



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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

proltelan design group
CERTIFICATE OF AUTHORIZATION NUMBER 7865
100 EAST PINE STREET, SUITE 600
ORLANDO FLORIDA 32801
PHONE (407) 246-0044
SCOTT G. HORLANDER, P.E. NO. 46624

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	VOLUSIA	240992-2-52-01

SIGNING & MARKING PLAN

SHEET NO. S-7

jmessenger 4/12/2011 1:08:31 PM P:\7287-US1-Dunlawton\240992252.01\signing\PLANSP04.DGN

CONTROLLER INTERVALS

Faller, Davis & Associates, Inc.

Updated 8/9/11

Intersection: US 1 at Herbert Street **EOR:** DJP **Date:** 8/30/2011

Movement # (Controller Phase Ø)	1	2	3	4	5	6	7	8
Direction of Travel	NBL	SB	N/A	EB/WB	SBL	NB	N/A	N/A
Existing Timings								
Min Green	*5*	*15*		*5*	*5*	*15*		
Extension	*3.0*	*4.0*		*3.0*	*3.0*	*4.0*		
Yellow	*4.0*	*4.0*		*4.0*	*4.0*	*4.0*		
Red Clearance	*1.0*	*2.0*		*2.0*	*1.0*	*2.0*		
Max I	*15.0*	*50.0*		*20.0*	*15.0*	*50.0*		
Max II	*0.0*	*0.0*		*0.0*	*0.0*	*0.0*		
Walk		*7*		*7*		*7*		
Pedestrian Clearance		*14*		*26*		*14*		
Calculated Timings								
Approach Speed (mph)[2]	40	40		25	40	40		
% Grade of Approach (+ Uphill, - Downhill)	0%	0%		0%	0%	0%		
Exposure Dist. (ft)[3]	57	50		107	57	49		
Crossing Dist. For Concurrent Ped Mvmnt (ft)[4]		40		85		39		
Pedestrian Crossing Speed (ft/sec)[5]		3.5		3.5		3.5		
Yellow[7]	4.0	4.0		3.0	4.0	4.0		
Red Clearance[7]	1.3	1.2		3.5	1.3	1.2		
Pedestrian Clearance[11]		12		25		12		
Recommended Timings								
Min Green[6]	5	15		5	5	15		
Extension[6]	3	4		3	3	4		
Yellow	4.0	4.0		4.0	4.0	4.0		
Red Clearance	1.3	2.0		3.5	1.3	2.0		
Max I[8]	15	50		20	15	50		
Max II[9]								
Walk[10]		7		7		7		
Pedestrian Clearance		14.0		26.0		14.0		
Minimum Split without Peds	11	21		13	11	21		
Maximum Split without Peds	21	56		28	21	56		

Notes

1 *Data to be entered in cells with black font and no fill color.*

2 *The 85th percentile or posted speed limit of the approach. If no speed limit is posted and the 85th percentile speed is not available, then 25 mph should be used. Used for calculation of the Yellow Change Interval and the Red Clearance Interval.*

3 *Through path or turning movement path from stop bar to last point of conflict including bicycle lanes and pedestrian crosswalks. The last point of conflict may be defined by District preference (i.e. D5 is last conflicting through lane & D1 is beyond furthest conflicting crosswalk). Exposure distances shall be measured for all left turn phases.*

4 *Curb to curb.*

5 *Use 3.5 fps. Use 3.0 fps for school crossings, locations where there is a significant elderly population, or where there are disabled pedestrians.*

6 *Use existing values and field adjust as necessary. Update values as needed for local preferences, dilemma zone protection, if newly signalized, or if loop placement changed.*

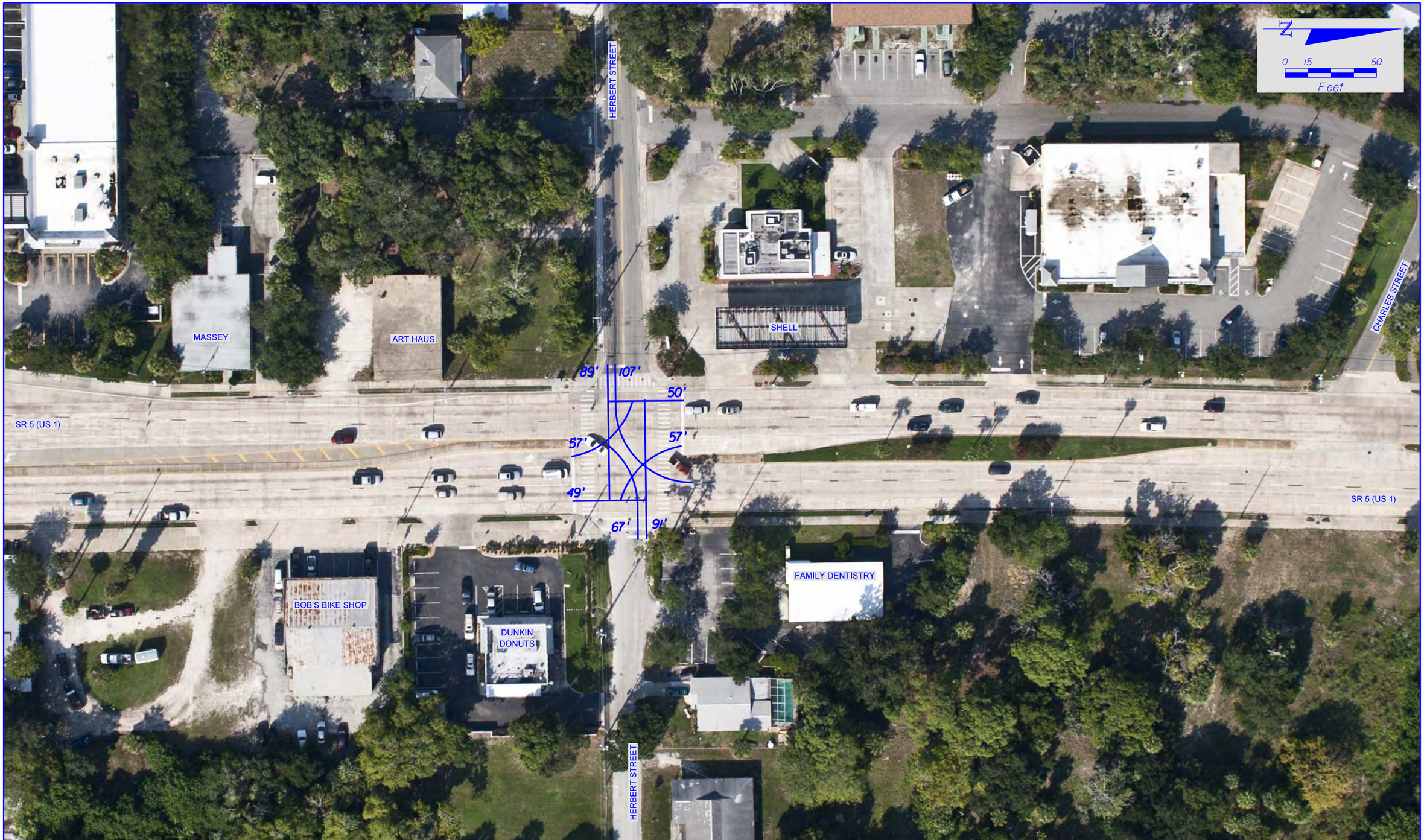
7 *Calculation based on 2009 MUTCD and 2011 TEM requirements. If calculated value lower than existing value, do not reduce without compelling reason. Yellow minimum 3.0 seconds. Yellow maximum 6.0 seconds. Red Clearance interval minimum 1.0 second and maximum 6.0 seconds. Maximums may be increased based on engineering judgment. When through and turning movements always terminate together (i.e. permissive left turn movement), the Red Clearance interval for the through movement shall be used. In the case of a split phased intersection or T-intersection, the longer of the left turn or through exposure distance should be used for the Red Clearance interval calculation.*

8 *Use existing values and field adjust as necessary. Update values as needed for local preferences.*

9 *Use existing values and field adjust as necessary. Update values as needed for local preferences. Calculate if Inhibit Max Termination is not used.*

10 *Use existing values and update values as needed for local preferences or to meet minimum requirements. 2009 MUTCD typical value 7.0 seconds, but may be reduced to 4.0 seconds. May be increased for school crossings, locations where there is a significant elderly population, or where there are disabled pedestrians.*

11 *Pedestrian Clearance must end at the start of the Yellow interval for the concurrent vehicle movement.*



CONTROLLER CABINET
TRAFFIC SIGNAL POLE
SIGNAL HEAD
SIGN
DELINEATOR
POWER POLE
LIGHT POLE
HYDRANT
DITCH BOTTOM INLET
MANHOLE
MITERED END SECTION
DRAINAGE INLET
GUARDRAIL
FENCE
TREE/SHRUB
BUILDING

Faffler, Davis & Associates, Inc.

EXPOSURE DISTANCE DIAGRAM

nspatola 9/9/2011 9:02:42 AM Z:\390.00 D5 Continuing Services for Traffic Operations\390.44 US 1 Intersection Analysis Studies\3. US 1 at Dunlawton Ave & Herbert St\DGN\Exposure Dist - Herbert

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	6	95	15	1	0	118	895	1	25	698	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	60		0	65		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	100		25	70		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.922									0.990	
Flt Protected		0.981			0.955		0.950			0.950		
Satd. Flow (prot)	0	1629	0	0	1779	0	1770	3539	0	1770	3504	0
Flt Permitted		0.867			0.556		0.336			0.306		
Satd. Flow (perm)	0	1439	0	0	1036	0	626	3539	0	570	3504	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36									9	
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	164	0	0	16	0	118	896	0	25	746	0
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4			4			6			2		
Detector Phase	4	4		4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		11.0	21.0		11.0	21.0	
Total Split (s)	29.0	29.0	0.0	29.0	29.0	0.0	19.0	112.0	0.0	19.0	112.0	0.0
Total Split (%)	18.1%	18.1%	0.0%	18.1%	18.1%	0.0%	11.9%	70.0%	0.0%	11.9%	70.0%	0.0%
Maximum Green (s)	21.5	21.5		21.5	21.5		13.7	106.0		13.7	106.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	3.5		3.5	3.5		1.3	2.0		1.3	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.0	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)		18.3			18.3		127.1	121.3		121.8	115.1	
Actuated g/C Ratio		0.11			0.11		0.79	0.76		0.76	0.72	
v/c Ratio		0.83			0.14		0.21	0.33		0.05	0.30	
Control Delay		85.5			64.5		8.1	12.1		4.0	8.6	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		85.5			64.5		8.1	12.1		4.0	8.6	
LOS		F			E		A	B		A	A	
Approach Delay		85.5			64.5			11.7			8.5	
Approach LOS		F			E			B			A	

Intersection Summary

Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 21 (13%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 17.0		Intersection LOS: B	
Intersection Capacity Utilization 53.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	6	95	15	1	0	118	895	1	25	698	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	11	11	10
Storage Length (ft)	0		80	0		0	103		0	91		90
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25		50	25		25	35		25	50		49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.956			0.955		0.950			0.950		
Satd. Flow (prot)	0	1721	1531	0	1779	0	1711	3421	0	1711	3421	1478
Flt Permitted		0.733			0.689		0.361			0.310		
Satd. Flow (perm)	0	1320	1531	0	1283	0	650	3421	0	558	3421	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95									40
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	95	0	16	0	118	896	0	25	698	48
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		2
Detector Phase	4	4	4	4	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	21.0
Total Split (s)	29.0	29.0	29.0	29.0	29.0	0.0	19.0	112.0	0.0	19.0	112.0	112.0
Total Split (%)	18.1%	18.1%	18.1%	18.1%	18.1%	0.0%	11.9%	70.0%	0.0%	11.9%	70.0%	70.0%
Maximum Green (s)	21.5	21.5	21.5	21.5	21.5		13.7	106.0		13.7	106.0	106.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	4.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)		13.7	13.7		13.7		131.6	126.0		126.6	120.0	120.0
Actuated g/C Ratio		0.09	0.09		0.09		0.82	0.79		0.79	0.75	0.75
v/c Ratio		0.61	0.44		0.15		0.20	0.33		0.05	0.27	0.04
Control Delay		91.7	17.5		68.1		6.7	10.7		3.2	7.0	2.4
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		91.7	17.5		68.1		6.7	10.7		3.2	7.0	2.4
LOS		F	B		E		A	B		A	A	A
Approach Delay		48.7			68.1			10.2			6.6	
Approach LOS		D			E			B			A	

Intersection Summary

Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 21 (13%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 12.5		Intersection LOS: B	
Intersection Capacity Utilization 52.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	6	95	15	1	0	118	895	1	25	698	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	11	11	10
Storage Length (ft)	0		80	0		0	103		0	91		90
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25		50	25		25	35		25	50		49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.956			0.955		0.950			0.950		
Satd. Flow (prot)	0	1721	1531	0	1779	0	1711	3421	0	1711	3421	1478
Flt Permitted		0.733			0.689		0.355			0.309		
Satd. Flow (perm)	0	1320	1531	0	1283	0	639	3421	0	556	3421	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95									47
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	95	0	16	0	118	896	0	25	698	48
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		2
Detector Phase	4	4	4	4	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	0.0	15.0	90.0	0.0	15.0	90.0	90.0
Total Split (%)	19.2%	19.2%	19.2%	19.2%	19.2%	0.0%	11.5%	69.2%	0.0%	11.5%	69.2%	69.2%
Maximum Green (s)	17.5	17.5	17.5	17.5	17.5		9.7	84.0		9.7	84.0	84.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	4.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)		12.1	12.1		12.1		103.2	97.5		98.2	91.6	91.6
Actuated g/C Ratio		0.09	0.09		0.09		0.79	0.75		0.76	0.70	0.70
v/c Ratio		0.56	0.41		0.13		0.21	0.35		0.05	0.29	0.05
Control Delay		72.6	15.6		54.3		4.4	6.6		3.5	8.0	2.3
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		72.6	15.6		54.3		4.4	6.6		3.5	8.0	2.3
LOS		E	B		D		A	A		A	A	A
Approach Delay		39.6			54.3			6.4			7.5	
Approach LOS		D			D			A			A	

Intersection Summary

Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 28 (22%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 10.0		Intersection LOS: A	
Intersection Capacity Utilization 52.2%		ICU Level of Service A	
Analysis Period (min) 15			

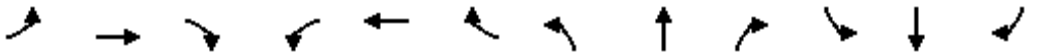
Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	6	95	15	1	0	123	895	1	25	698	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	11	11	10
Storage Length (ft)	0		80	0		0	103		0	91		90
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25		50	25		25	35		25	50		49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.956			0.955		0.950			0.950		
Satd. Flow (prot)	0	1721	1531	0	1779	0	1711	3421	0	1711	3421	1478
Flt Permitted		0.733			0.689		0.355			0.309		
Satd. Flow (perm)	0	1320	1531	0	1283	0	639	3421	0	556	3421	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95									47
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	95	0	16	0	123	896	0	25	698	48
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		2
Detector Phase	4	4	4	4	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	0.0	15.0	90.0	0.0	15.0	90.0	90.0
Total Split (%)	19.2%	19.2%	19.2%	19.2%	19.2%	0.0%	11.5%	69.2%	0.0%	11.5%	69.2%	69.2%
Maximum Green (s)	17.5	17.5	17.5	17.5	17.5		9.7	84.0		9.7	84.0	84.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	4.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)		12.1	12.1		12.1		103.2	97.5		98.2	91.6	91.6
Actuated g/C Ratio		0.09	0.09		0.09		0.79	0.75		0.76	0.70	0.70
v/c Ratio		0.56	0.41		0.13		0.22	0.35		0.05	0.29	0.05
Control Delay		72.6	15.6		54.3		4.4	6.6		3.5	8.0	2.3
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		72.6	15.6		54.3		4.4	6.6		3.5	8.0	2.3
LOS		E	B		D		A	A		A	A	A
Approach Delay		39.6			54.3			6.3			7.5	
Approach LOS		D			D			A			A	

Intersection Summary

Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 28 (22%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 10.0		Intersection LOS: A	
Intersection Capacity Utilization 52.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	6	95	15	1	0	118	895	1	25	698	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		80	0		0	60		0	65		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	100		25	70		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850								0.990	
Flt Protected		0.956			0.955		0.950			0.950		
Satd. Flow (prot)	0	1721	1531	0	1779	0	1770	3539	0	1770	3504	0
Flt Permitted		0.733			0.689		0.336			0.309		
Satd. Flow (perm)	0	1320	1531	0	1283	0	626	3539	0	576	3504	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95								11	
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	95	0	16	0	118	896	0	25	746	0
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		
Detector Phase	4	4	4	4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	
Total Split (s)	25.0	25.0	25.0	25.0	25.0	0.0	15.0	90.0	0.0	15.0	90.0	0.0
Total Split (%)	19.2%	19.2%	19.2%	19.2%	19.2%	0.0%	11.5%	69.2%	0.0%	11.5%	69.2%	0.0%
Maximum Green (s)	17.5	17.5	17.5	17.5	17.5		9.7	84.0		9.7	84.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Act Effct Green (s)		12.1	12.1		12.1		103.1	97.5		98.3	91.7	
Actuated g/C Ratio		0.09	0.09		0.09		0.79	0.75		0.76	0.71	
v/c Ratio		0.56	0.41		0.13		0.21	0.34		0.05	0.30	
Control Delay		72.6	15.6		54.3		4.4	6.6		3.5	7.9	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		72.6	15.6		54.3		4.4	6.6		3.5	7.9	
LOS		E	B		D		A	A		A	A	
Approach Delay		39.6			54.3			6.3			7.7	
Approach LOS		D			D			A			A	

Intersection Summary

Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 28 (22%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 10.1		Intersection LOS: B	
Intersection Capacity Utilization 52.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	7	115	18	1	0	143	1083	1	30	845	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	60		0	65		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	100		25	70		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.922									0.990	
Flt Protected		0.981			0.955		0.950			0.950		
Satd. Flow (prot)	0	1629	0	0	1779	0	1770	3539	0	1770	3504	0
Flt Permitted		0.866			0.530		0.273			0.242		
Satd. Flow (perm)	0	1438	0	0	987	0	509	3539	0	451	3504	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36									9	
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	198	0	0	19	0	143	1084	0	30	903	0
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4			4			6			2		
Detector Phase	4	4		4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		11.0	21.0		11.0	21.0	
Total Split (s)	29.0	29.0	0.0	29.0	29.0	0.0	19.0	112.0	0.0	19.0	112.0	0.0
Total Split (%)	18.1%	18.1%	0.0%	18.1%	18.1%	0.0%	11.9%	70.0%	0.0%	11.9%	70.0%	0.0%
Maximum Green (s)	21.5	21.5		21.5	21.5		13.7	106.0		13.7	106.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	3.5		3.5	3.5		1.3	2.0		1.3	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.0	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)		20.5			20.5		125.3	119.0		119.0	112.2	
Actuated g/C Ratio		0.13			0.13		0.78	0.74		0.74	0.70	
v/c Ratio		0.92			0.15		0.31	0.41		0.08	0.37	
Control Delay		98.6			64.5		8.8	13.5		4.4	10.2	
Queue Delay		0.0			0.0		0.0	0.2		0.0	0.0	
Total Delay		98.6			64.5		8.8	13.6		4.4	10.2	
LOS		F			E		A	B		A	B	
Approach Delay		98.6			64.5			13.1			10.0	
Approach LOS		F			E			B			B	

Intersection Summary

Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 21 (13%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 19.4		Intersection LOS: B	
Intersection Capacity Utilization 60.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	7	115	18	1	0	143	1083	1	30	845	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	11	11	10
Storage Length (ft)	0		80	0		0	103		0	91		90
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25		50	25		25	35		25	50		49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.956			0.955		0.950			0.950		
Satd. Flow (prot)	0	1721	1531	0	1779	0	1711	3421	0	1711	3421	1478
Flt Permitted		0.730			0.677		0.301			0.247		
Satd. Flow (perm)	0	1314	1531	0	1261	0	542	3421	0	445	3421	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115									40
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Lane Group Flow (vph)	0	83	115	0	19	0	143	1084	0	30	845	58
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		2
Detector Phase	4	4	4	4	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	21.0
Total Split (s)	29.0	29.0	29.0	29.0	29.0	0.0	19.0	112.0	0.0	19.0	112.0	112.0
Total Split (%)	18.1%	18.1%	18.1%	18.1%	18.1%	0.0%	11.9%	70.0%	0.0%	11.9%	70.0%	70.0%
Maximum Green (s)	21.5	21.5	21.5	21.5	21.5		13.7	106.0		13.7	106.0	106.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	6.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	4.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)		15.3	15.3		15.3		130.4	124.2		124.5	117.7	117.7
Actuated g/C Ratio		0.10	0.10		0.10		0.82	0.78		0.78	0.74	0.74
v/c Ratio		0.66	0.46		0.16		0.28	0.41		0.08	0.34	0.05
Control Delay		93.1	16.1		66.9		7.3	11.9		3.8	8.4	3.2
Queue Delay		0.0	0.0		0.0		0.0	0.1		0.0	0.0	0.0
Total Delay		93.1	16.1		66.9		7.3	12.1		3.8	8.4	3.2
LOS		F	B		E		A	B		A	A	A
Approach Delay		48.4			66.9			11.5			7.9	
Approach LOS		D			E			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 21 (13%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 13.6		Intersection LOS: B	
Intersection Capacity Utilization 57.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	7	115	18	1	0	143	1083	1	30	845	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	11	11	10
Storage Length (ft)	0		80	0		0	103		0	91		90
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25		50	25		25	35		25	50		49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.956			0.955		0.950			0.950		
Satd. Flow (prot)	0	1721	1531	0	1779	0	1711	3421	0	1711	3421	1478
Flt Permitted		0.730			0.677		0.297			0.246		
Satd. Flow (perm)	0	1314	1531	0	1261	0	535	3421	0	443	3421	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115									47
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	83	115	0	19	0	143	1084	0	30	845	58
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		2
Detector Phase	4	4	4	4	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	0.0	15.0	100.0	0.0	15.0	100.0	100.0
Total Split (%)	17.9%	17.9%	17.9%	17.9%	17.9%	0.0%	10.7%	71.4%	0.0%	10.7%	71.4%	71.4%
Maximum Green (s)	17.5	17.5	17.5	17.5	17.5		9.7	94.0		9.7	94.0	94.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	4.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)		13.6	13.6		13.6		112.0	106.0		106.4	99.7	99.7
Actuated g/C Ratio		0.10	0.10		0.10		0.80	0.76		0.76	0.71	0.71
v/c Ratio		0.65	0.46		0.16		0.29	0.42		0.08	0.35	0.05
Control Delay		83.5	15.5		58.9		3.6	5.7		3.7	8.6	2.7
Queue Delay		0.0	0.0		0.0		0.0	0.1		0.0	0.0	0.0
Total Delay		83.5	15.5		58.9		3.6	5.9		3.7	8.6	2.7
LOS		F	B		E		A	A		A	A	A
Approach Delay		44.0			58.9			5.6			8.1	
Approach LOS		D			E			A			A	

Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 34 (24%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 10.2		Intersection LOS: B	
Intersection Capacity Utilization 57.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	7	115	18	1	0	149	1083	1	30	845	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	11	11	10
Storage Length (ft)	0		80	0		0	103		0	91		90
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25		50	25		25	35		25	50		49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.956			0.955		0.950			0.950		
Satd. Flow (prot)	0	1721	1531	0	1779	0	1711	3421	0	1711	3421	1478
Flt Permitted		0.730			0.677		0.297			0.246		
Satd. Flow (perm)	0	1314	1531	0	1261	0	535	3421	0	443	3421	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115									47
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	83	115	0	19	0	149	1084	0	30	845	58
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		2
Detector Phase	4	4	4	4	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	0.0	15.0	100.0	0.0	15.0	100.0	100.0
Total Split (%)	17.9%	17.9%	17.9%	17.9%	17.9%	0.0%	10.7%	71.4%	0.0%	10.7%	71.4%	71.4%
Maximum Green (s)	17.5	17.5	17.5	17.5	17.5		9.7	94.0		9.7	94.0	94.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	4.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)		13.6	13.6		13.6		112.0	106.0		106.3	99.6	99.6
Actuated g/C Ratio		0.10	0.10		0.10		0.80	0.76		0.76	0.71	0.71
v/c Ratio		0.65	0.46		0.16		0.30	0.42		0.08	0.35	0.05
Control Delay		83.5	15.5		58.9		3.7	5.7		3.7	8.7	2.7
Queue Delay		0.0	0.0		0.0		0.0	0.1		0.0	0.0	0.0
Total Delay		83.5	15.5		58.9		3.7	5.8		3.7	8.7	2.7
LOS		F	B		E		A	A		A	A	A
Approach Delay		44.0			58.9			5.6			8.1	
Approach LOS		D			E			A			A	

Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 34 (24%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 10.2		Intersection LOS: B	
Intersection Capacity Utilization 57.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	7	115	18	1	0	143	1083	1	30	845	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		80	0		0	60		0	65		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	100		25	70		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850								0.990	
Flt Protected		0.956			0.955		0.950			0.950		
Satd. Flow (prot)	0	1721	1531	0	1779	0	1770	3539	0	1770	3504	0
Flt Permitted		0.730			0.677		0.277			0.246		
Satd. Flow (perm)	0	1314	1531	0	1261	0	516	3539	0	458	3504	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115								11	
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	83	115	0	19	0	143	1084	0	30	903	0
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		
Detector Phase	4	4	4	4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	
Total Split (s)	25.0	25.0	25.0	25.0	25.0	0.0	15.0	100.0	0.0	15.0	100.0	0.0
Total Split (%)	17.9%	17.9%	17.9%	17.9%	17.9%	0.0%	10.7%	71.4%	0.0%	10.7%	71.4%	0.0%
Maximum Green (s)	17.5	17.5	17.5	17.5	17.5		9.7	94.0		9.7	94.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Act Effct Green (s)		13.6	13.6		13.6		112.0	106.0		106.4	99.7	
Actuated g/C Ratio		0.10	0.10		0.10		0.80	0.76		0.76	0.71	
v/c Ratio		0.65	0.46		0.16		0.30	0.40		0.07	0.36	
Control Delay		83.5	15.5		58.9		2.3	5.0		3.7	8.6	
Queue Delay		0.0	0.0		0.0		0.0	0.2		0.0	0.0	
Total Delay		83.5	15.5		58.9		2.3	5.2		3.7	8.6	
LOS		F	B		E		A	A		A	A	
Approach Delay		44.0			58.9			4.9			8.5	
Approach LOS		D			E			A			A	

Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 34 (24%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 10.0		Intersection LOS: A	
Intersection Capacity Utilization 57.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	5	89	9	5	4	111	695	1	6	1163	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	60		0	65		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	100		25	70		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.931			0.970						0.988	
Flt Protected		0.977			0.976		0.950			0.950		
Satd. Flow (prot)	0	1638	0	0	1763	0	1770	3539	0	1770	3497	0
Flt Permitted		0.843			0.776		0.171			0.387		
Satd. Flow (perm)	0	1413	0	0	1402	0	319	3539	0	721	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			4						12	
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	175	0	0	18	0	111	696	0	6	1263	0
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4			4			6			2		
Detector Phase	4	4		4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		11.0	21.0		11.0	21.0	
Total Split (s)	29.0	29.0	0.0	29.0	29.0	0.0	19.0	112.0	0.0	19.0	112.0	0.0
Total Split (%)	18.1%	18.1%	0.0%	18.1%	18.1%	0.0%	11.9%	70.0%	0.0%	11.9%	70.0%	0.0%
Maximum Green (s)	21.5	21.5		21.5	21.5		13.7	106.0		13.7	106.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	3.5		3.5	3.5		1.3	2.0		1.3	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.0	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)		19.8			19.8		127.0	124.5		120.0	113.7	
Actuated g/C Ratio		0.12			0.12		0.79	0.78		0.75	0.71	
v/c Ratio		0.88			0.10		0.34	0.25		0.01	0.51	
Control Delay		96.6			52.4		12.1	9.0		4.0	11.5	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		96.6			52.4		12.1	9.0		4.0	11.5	
LOS		F			D		B	A		A	B	
Approach Delay		96.6			52.4			9.4			11.5	
Approach LOS		F			D			A			B	

Intersection Summary

Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 21 (13%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 17.6		Intersection LOS: B	
Intersection Capacity Utilization 69.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	5	89	9	5	4	111	695	1	6	1163	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	11	11	10
Storage Length (ft)	0		80	0		0	103		0	91		90
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25		50	25		25	35		25	50		49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.970							0.850
Flt Protected		0.955			0.976		0.950			0.950		
Satd. Flow (prot)	0	1720	1531	0	1763	0	1711	3421	0	1711	3421	1478
Flt Permitted		0.725			0.825		0.202			0.387		
Satd. Flow (perm)	0	1305	1531	0	1491	0	364	3421	0	697	3421	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89		4							50
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	89	0	18	0	111	696	0	6	1163	100
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		2
Detector Phase	4	4	4	4	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	21.0
Total Split (s)	29.0	29.0	29.0	29.0	29.0	0.0	19.0	112.0	0.0	19.0	112.0	112.0
Total Split (%)	18.1%	18.1%	18.1%	18.1%	18.1%	0.0%	11.9%	70.0%	0.0%	11.9%	70.0%	70.0%
Maximum Green (s)	21.5	21.5	21.5	21.5	21.5		13.7	106.0		13.7	106.0	106.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	4.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)		15.6	15.6		15.6		131.2	128.6		124.3	118.0	118.0
Actuated g/C Ratio		0.10	0.10		0.10		0.82	0.80		0.78	0.74	0.74
v/c Ratio		0.68	0.39		0.12		0.31	0.25		0.01	0.46	0.09
Control Delay		93.9	16.1		54.4		9.4	8.0		3.7	9.6	3.9
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		93.9	16.1		54.4		9.4	8.0		3.7	9.6	3.9
LOS		F	B		D		A	A		A	A	A
Approach Delay		54.4			54.4			8.2			9.1	
Approach LOS		D			D			A			A	

Intersection Summary

Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 21 (13%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 12.6		Intersection LOS: B	
Intersection Capacity Utilization 62.1%		ICU Level of Service B	
Analysis Period (min) 15			

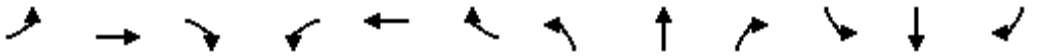
Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	5	89	9	5	4	111	695	1	6	1163	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	11	11	10
Storage Length (ft)	0		80	0		0	103		0	91		90
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25		50	25		25	35		25	50		49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.970							0.850
Flt Protected		0.955			0.976		0.950			0.950		
Satd. Flow (prot)	0	1720	1531	0	1763	0	1711	3421	0	1711	3421	1478
Flt Permitted		0.725			0.816		0.194			0.387		
Satd. Flow (perm)	0	1305	1531	0	1474	0	349	3421	0	697	3421	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89		4							59
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	89	0	18	0	111	696	0	6	1163	100
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		2
Detector Phase	4	4	4	4	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	0.0	15.0	90.0	0.0	15.0	90.0	90.0
Total Split (%)	19.2%	19.2%	19.2%	19.2%	19.2%	0.0%	11.5%	69.2%	0.0%	11.5%	69.2%	69.2%
Maximum Green (s)	17.5	17.5	17.5	17.5	17.5		9.7	84.0		9.7	84.0	84.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	4.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)		13.3	13.3		13.3		103.4	100.9		96.8	90.4	90.4
Actuated g/C Ratio		0.10	0.10		0.10		0.80	0.78		0.74	0.70	0.70
v/c Ratio		0.64	0.38		0.12		0.31	0.26		0.01	0.49	0.10
Control Delay		76.6	14.8		44.2		7.5	4.5		3.7	10.5	3.7
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		76.6	14.8		44.2		7.5	4.5		3.7	10.5	3.7
LOS		E	B		D		A	A		A	B	A
Approach Delay		45.2			44.2			5.0			10.0	
Approach LOS		D			D			A			A	

Intersection Summary

Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 25 (19%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 62.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	5	89	9	5	4	112	695	1	5	1164	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	11	11	10
Storage Length (ft)	0		80	0		0	103		0	91		90
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25		50	25		25	35		25	50		49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.970							0.850
Flt Protected		0.955			0.976		0.950			0.950		
Satd. Flow (prot)	0	1720	1531	0	1763	0	1711	3421	0	1711	3421	1478
Flt Permitted		0.725			0.816		0.193			0.387		
Satd. Flow (perm)	0	1305	1531	0	1474	0	348	3421	0	697	3421	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89		4							59
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	89	0	18	0	112	696	0	5	1164	100
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		2
Detector Phase	4	4	4	4	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	0.0	15.0	90.0	0.0	15.0	90.0	90.0
Total Split (%)	19.2%	19.2%	19.2%	19.2%	19.2%	0.0%	11.5%	69.2%	0.0%	11.5%	69.2%	69.2%
Maximum Green (s)	17.5	17.5	17.5	17.5	17.5		9.7	84.0		9.7	84.0	84.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	4.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)		13.3	13.3		13.3		103.5	100.9		96.7	90.4	90.4
Actuated g/C Ratio		0.10	0.10		0.10		0.80	0.78		0.74	0.70	0.70
v/c Ratio		0.64	0.38		0.12		0.32	0.26		0.01	0.49	0.10
Control Delay		76.6	14.8		44.2		7.6	4.5		3.6	10.5	3.7
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		76.6	14.8		44.2		7.6	4.5		3.6	10.5	3.7
LOS		E	B		D		A	A		A	B	A
Approach Delay		45.2			44.2			5.0			10.0	
Approach LOS		D			D			A			A	

Intersection Summary

Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 25 (19%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 62.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	5	89	9	5	4	111	695	1	6	1163	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		80	0		0	60		0	65		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	100		25	70		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.970						0.988	
Flt Protected		0.955			0.976		0.950			0.950		
Satd. Flow (prot)	0	1720	1531	0	1763	0	1770	3539	0	1770	3497	0
Flt Permitted		0.725			0.816		0.169			0.387		
Satd. Flow (perm)	0	1305	1531	0	1474	0	315	3539	0	721	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89		4						14	
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	89	0	18	0	111	696	0	6	1263	0
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		
Detector Phase	4	4	4	4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	
Total Split (s)	25.0	25.0	25.0	25.0	25.0	0.0	15.0	90.0	0.0	15.0	90.0	0.0
Total Split (%)	19.2%	19.2%	19.2%	19.2%	19.2%	0.0%	11.5%	69.2%	0.0%	11.5%	69.2%	0.0%
Maximum Green (s)	17.5	17.5	17.5	17.5	17.5		9.7	84.0		9.7	84.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Act Effct Green (s)		13.3	13.3		13.3		103.4	100.9		96.8	90.5	
Actuated g/C Ratio		0.10	0.10		0.10		0.80	0.78		0.74	0.70	
v/c Ratio		0.64	0.38		0.12		0.33	0.25		0.01	0.52	
Control Delay		76.6	14.8		44.2		9.0	4.5		3.7	10.7	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		76.6	14.8		44.2		9.0	4.5		3.7	10.7	
LOS		E	B		D		A	A		A	B	
Approach Delay		45.2			44.2			5.1			10.7	
Approach LOS		D			D			A			B	

Intersection Summary

Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 25 (19%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 11.6		Intersection LOS: B	
Intersection Capacity Utilization 65.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	6	108	11	6	5	134	841	1	7	1407	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	60		0	65		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	100		25	70		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.931			0.969						0.988	
Flt Protected		0.977			0.976		0.950			0.950		
Satd. Flow (prot)	0	1638	0	0	1762	0	1770	3539	0	1770	3497	0
Flt Permitted		0.841			0.751		0.112			0.335		
Satd. Flow (perm)	0	1410	0	0	1356	0	209	3539	0	624	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			5						12	
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	212	0	0	22	0	134	842	0	7	1528	0
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4			4			6			2		
Detector Phase	4	4		4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		11.0	21.0		11.0	21.0	
Total Split (s)	29.0	29.0	0.0	29.0	29.0	0.0	19.0	112.0	0.0	19.0	112.0	0.0
Total Split (%)	18.1%	18.1%	0.0%	18.1%	18.1%	0.0%	11.9%	70.0%	0.0%	11.9%	70.0%	0.0%
Maximum Green (s)	21.5	21.5		21.5	21.5		13.7	106.0		13.7	106.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	3.5		3.5	3.5		1.3	2.0		1.3	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	4.0	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)		21.5			21.5		125.7	122.8		117.5	111.1	
Actuated g/C Ratio		0.13			0.13		0.79	0.77		0.73	0.69	
v/c Ratio		1.00			0.12		0.54	0.31		0.01	0.63	
Control Delay		119.1			52.2		27.8	9.7		4.0	14.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		119.1			52.2		27.8	9.7		4.0	14.7	
LOS		F			D		C	A		A	B	
Approach Delay		119.1			52.2			12.1			14.7	
Approach LOS		F			D			B			B	

Intersection Summary

Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 21 (13%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 22.1		Intersection LOS: C	
Intersection Capacity Utilization 80.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	6	108	11	6	5	134	841	1	7	1407	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	11	11	10
Storage Length (ft)	0		80	0		0	103		0	91		90
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25		50	25		25	35		25	50		49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.969							0.850
Flt Protected		0.955			0.976		0.950			0.950		
Satd. Flow (prot)	0	1720	1531	0	1762	0	1711	3421	0	1711	3421	1478
Flt Permitted		0.722			0.819		0.143			0.335		
Satd. Flow (perm)	0	1300	1531	0	1478	0	257	3421	0	603	3421	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			108		5							50
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	108	0	22	0	134	842	0	7	1407	121
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		2
Detector Phase	4	4	4	4	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	21.0
Total Split (s)	29.0	29.0	29.0	29.0	29.0	0.0	19.0	112.0	0.0	19.0	112.0	112.0
Total Split (%)	18.1%	18.1%	18.1%	18.1%	18.1%	0.0%	11.9%	70.0%	0.0%	11.9%	70.0%	70.0%
Maximum Green (s)	21.5	21.5	21.5	21.5	21.5		13.7	106.0		13.7	106.0	106.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	4.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)		17.2	17.2		17.2		129.8	127.1		122.2	115.8	115.8
Actuated g/C Ratio		0.11	0.11		0.11		0.81	0.79		0.76	0.72	0.72
v/c Ratio		0.74	0.41		0.13		0.47	0.31		0.01	0.57	0.11
Control Delay		98.4	15.1		53.4		19.7	8.8		3.9	12.1	4.7
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		98.4	15.1		53.4		19.7	8.8		3.9	12.1	4.7
LOS		F	B		D		B	A		A	B	A
Approach Delay		56.0			53.4			10.3			11.4	
Approach LOS		E			D			B			B	

Intersection Summary

Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 21 (13%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 14.8		Intersection LOS: B	
Intersection Capacity Utilization 71.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	6	108	11	6	5	134	841	1	7	1407	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	11	11	10
Storage Length (ft)	0		80	0		0	103		0	91		90
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25		50	25		25	35		25	50		49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.969							0.850
Flt Protected		0.955			0.976		0.950			0.950		
Satd. Flow (prot)	0	1720	1531	0	1762	0	1711	3421	0	1711	3421	1478
Flt Permitted		0.722			0.811		0.138			0.335		
Satd. Flow (perm)	0	1300	1531	0	1464	0	248	3421	0	603	3421	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			108		5							59
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	108	0	22	0	134	842	0	7	1407	121
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		2
Detector Phase	4	4	4	4	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	0.0	15.0	100.0	0.0	15.0	100.0	100.0
Total Split (%)	17.9%	17.9%	17.9%	17.9%	17.9%	0.0%	10.7%	71.4%	0.0%	10.7%	71.4%	71.4%
Maximum Green (s)	17.5	17.5	17.5	17.5	17.5		9.7	94.0		9.7	94.0	94.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	4.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)		15.0	15.0		15.0		111.9	109.2		104.6	98.2	98.2
Actuated g/C Ratio		0.11	0.11		0.11		0.80	0.78		0.75	0.70	0.70
v/c Ratio		0.74	0.41		0.14		0.48	0.32		0.01	0.59	0.11
Control Delay		90.2	14.7		47.5		17.7	1.9		3.6	12.3	4.3
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		90.2	14.7		47.5		17.7	1.9		3.6	12.3	4.3
LOS		F	B		D		B	A		A	B	A
Approach Delay		51.8			47.5			4.1			11.6	
Approach LOS		D			D			A			B	

Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 35 (25%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 12.3		Intersection LOS: B	
Intersection Capacity Utilization 71.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	6	108	11	6	5	136	841	1	6	1408	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	11	11	11	11	11	10
Storage Length (ft)	0		80	0		0	103		0	91		90
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25		50	25		25	35		25	50		49
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.969							0.850
Flt Protected		0.955			0.976		0.950			0.950		
Satd. Flow (prot)	0	1720	1531	0	1762	0	1711	3421	0	1711	3421	1478
Flt Permitted		0.722			0.811		0.138			0.335		
Satd. Flow (perm)	0	1300	1531	0	1464	0	248	3421	0	603	3421	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			108		5							59
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	108	0	22	0	136	842	0	6	1408	121
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		Perm
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		2
Detector Phase	4	4	4	4	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	0.0	15.0	100.0	0.0	15.0	100.0	100.0
Total Split (%)	17.9%	17.9%	17.9%	17.9%	17.9%	0.0%	10.7%	71.4%	0.0%	10.7%	71.4%	71.4%
Maximum Green (s)	17.5	17.5	17.5	17.5	17.5		9.7	94.0		9.7	94.0	94.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	4.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)		15.0	15.0		15.0		111.9	109.3		104.5	98.2	98.2
Actuated g/C Ratio		0.11	0.11		0.11		0.80	0.78		0.75	0.70	0.70
v/c Ratio		0.74	0.41		0.14		0.48	0.32		0.01	0.59	0.11
Control Delay		90.2	14.7		47.5		18.2	1.9		3.7	12.3	4.3
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		90.2	14.7		47.5		18.2	1.9		3.7	12.3	4.3
LOS		F	B		D		B	A		A	B	A
Approach Delay		51.8			47.5			4.2			11.7	
Approach LOS		D			D			A			B	

Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 35 (25%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 12.4		Intersection LOS: B	
Intersection Capacity Utilization 71.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	6	108	11	6	5	134	841	1	7	1407	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		80	0		0	60		0	65		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	100		25	70		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.969						0.988	
Flt Protected		0.955			0.976		0.950			0.950		
Satd. Flow (prot)	0	1720	1531	0	1762	0	1770	3539	0	1770	3497	0
Flt Permitted		0.722			0.811		0.115			0.335		
Satd. Flow (perm)	0	1300	1531	0	1464	0	214	3539	0	624	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			108		5						14	
Link Speed (mph)		35			25			40			40	
Link Distance (ft)		1000			1000			750			998	
Travel Time (s)		19.5			27.3			12.8			17.0	
Peak Hour 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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	108	0	22	0	134	842	0	7	1528	0
Turn Type	Perm		Perm	Perm			pm+pt			pm+pt		
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4		4	4			6			2		
Detector Phase	4	4	4	4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0		11.0	21.0		11.0	21.0	
Total Split (s)	25.0	25.0	25.0	25.0	25.0	0.0	15.0	100.0	0.0	15.0	100.0	0.0
Total Split (%)	17.9%	17.9%	17.9%	17.9%	17.9%	0.0%	10.7%	71.4%	0.0%	10.7%	71.4%	0.0%
Maximum Green (s)	17.5	17.5	17.5	17.5	17.5		9.7	94.0		9.7	94.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5		1.3	2.0		1.3	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	5.3	6.0	4.0	5.3	6.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		3.0	4.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Act Effct Green (s)		15.0	15.0		15.0		111.9	109.2		104.6	98.3	
Actuated g/C Ratio		0.11	0.11		0.11		0.80	0.78		0.75	0.70	
v/c Ratio		0.74	0.41		0.14		0.52	0.30		0.01	0.62	
Control Delay		90.2	14.7		47.5		23.9	1.8		3.6	12.8	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		90.2	14.7		47.5		23.9	1.8		3.6	12.8	
LOS		F	B		D		C	A		A	B	
Approach Delay		51.8			47.5			4.9			12.7	
Approach LOS		D			D			A			B	

Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 35 (25%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 13.2		Intersection LOS: B	
Intersection Capacity Utilization 75.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 5: Herbert Street & US 1