COMPOSITE STUDY

For

Big Tree Road and Golfview Boulevard / Graham Street
South Daytona, Volusia County

Prepared for:

Professional Consulting Services Related To
Traffic Operations Studies and Transportation Engineering Services
TEDS Contract Number: 10210
Task Work Order: 2011-1-1

Traffic Engineering Data Solutions, Inc.

Traffic Engineering Data Solutions, Inc.
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January 2012
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EXECUTIVE SUMMARY

Traffic Engineering Data Solutions, Inc. (TEDS) was retained on behalf of the Volusia Transportation Planning Organization (VTPO) to conduct a qualitative assessment reviewing operations and safety of the intersection of Big Tree Road and Golfview Boulevard / Graham Street. Additionally, conceptual locations for the installation of a mast arm traffic signal are included. Located in the City of South Daytona, Volusia County, the study intersection is located ½ mile west of US 1.

During a review of the initial draft study completed by TEDS, Volusia County Traffic Engineering Office used the data contained within and completed a traffic signal warrant analysis at the study intersection. The result of the County's analysis is as follows:

> *"The traffic pattern has changed at this intersection since direct access to the school is no longer allowed and the City recently prohibited freight traffic along Big Tree Road. As such, based upon the TMCs conducted by this study, the existing signal is not warranted when including all vehicle, pedestrian, and bicycle activity in the analysis and reviewing the crashes. Analysis indicates the signal causes more north/south delay than if a 2-way north/south stop control in the peak PM period. Refer to the attached Volusia County Signal Warrant analysis supplement, which was conducted independently of this Feasibility Report and attached as a supplement."(Appendix)*

Based on comments from Volusia County, the signal is not warranted due to the change in conditions related to school access. However, observations completed as part of a follow-up review confirmed school crossing guards are present during arrival and dismissal times for the elementary school. The City of South Daytona desires to retain the signalized intersection and move forward with upgrading the existing concrete strain pole box span configuration to a double mast arm setup along with the necessary pedestrian facilities to allow access across all approaches of the intersection (including the school crossing).

An improvement diagram shown in Figure 12 graphically illustrates the improvements described above. Additionally, a cost estimate was developed for the proposed improvements utilizing a combination of the Florida Department of Transportation (FDOT) Annual Statewide Averages, FDOT Six Month Moving Average, and cost estimates for similar project available to TEDS to determine unit cost. Below is a summary of costs;

- **Construction Cost equals $176,382.64 (including contingency)**
- **Design Fee equals $26,457.40**
- **Construction Engineering Inspection equals $13,228.70**
- **Total Cost Estimate including all phases equals $216,068.73**

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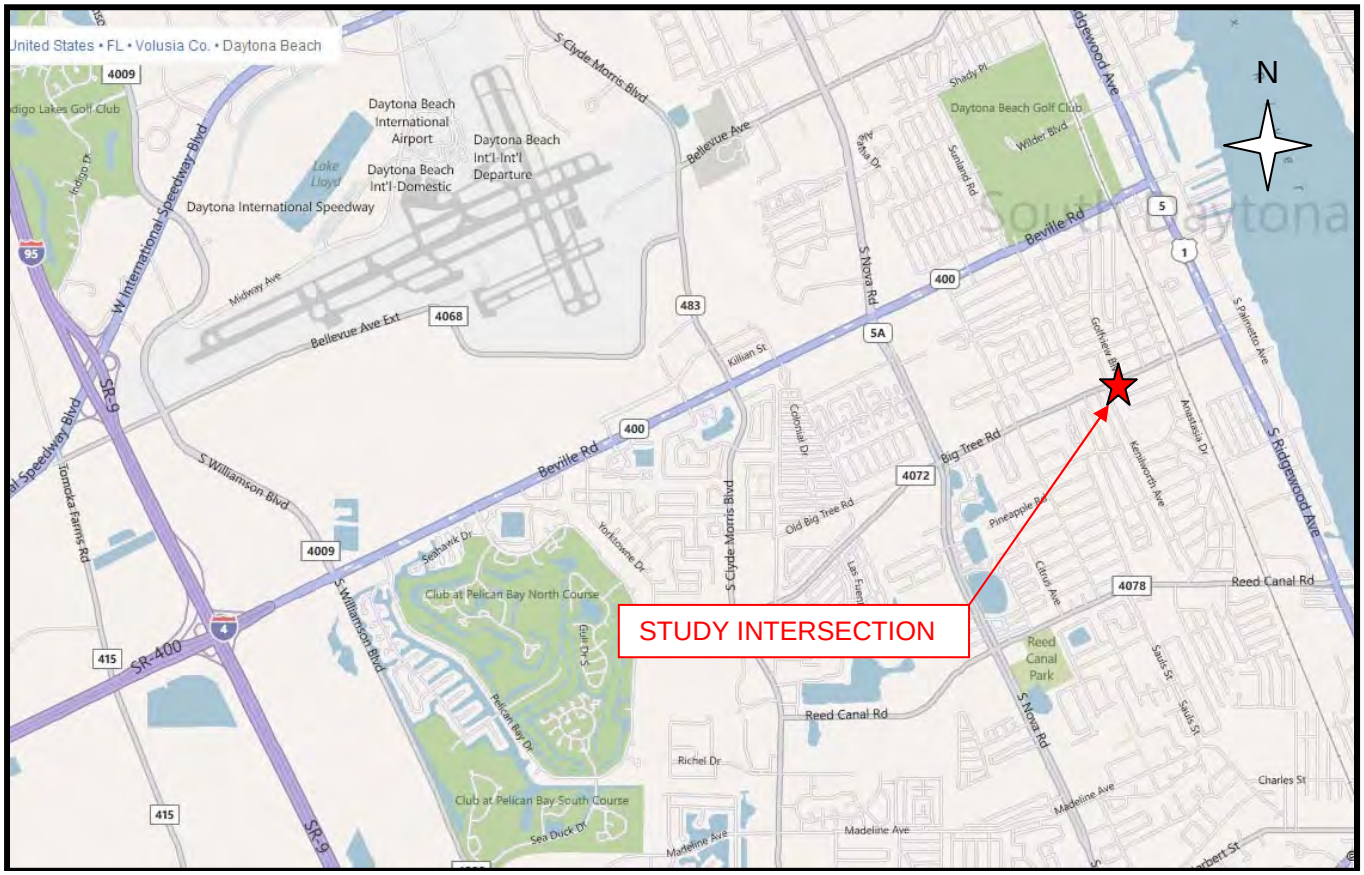
INTRODUCTION

Traffic Engineering Data Solutions, Inc. (TEDS) was retained on behalf of the Volusia Transportation Planning Organization (VTPO) to conduct a qualitative assessment reviewing operations and safety of the intersection of Big Tree Road and Golfview Boulevard / Graham Street. Additionally, conceptual locations for the installation of a mast arm traffic signal are included. Located in the City of South Daytona, Volusia County, the study intersection is located ½ mile west of US 1 in Figure 1.

Figure 1
General Location Map
Big Tree Road and Golfview Boulevard / Graham Street



(Source: Bing Maps)

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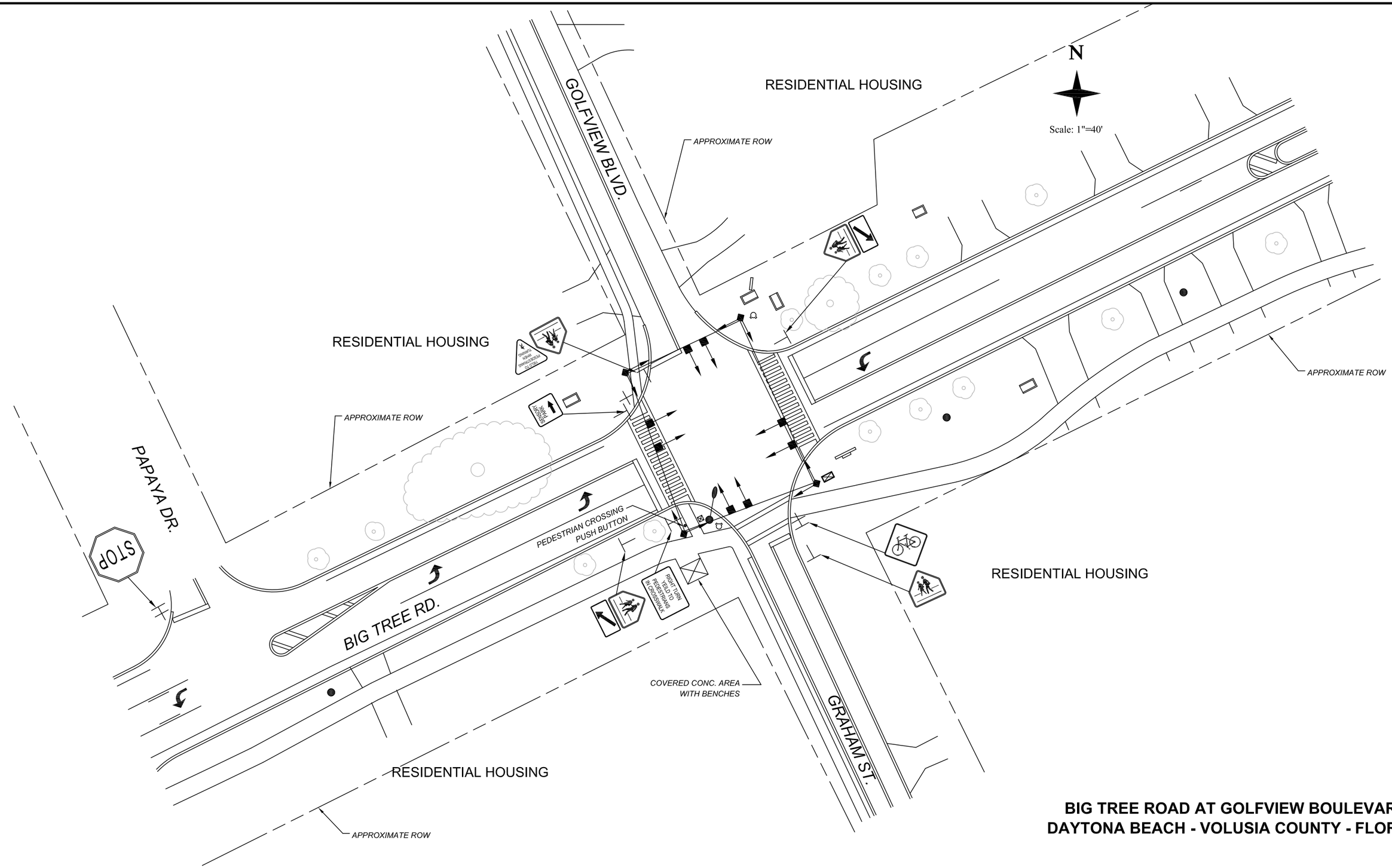
EXISTING CONDITIONS

Big Tree Road is a two-lane rural collector traveling in the east-west direction connecting State Road 5A (Nova Road) to US 1 (Ridgewood Avenue). Golfview Boulevard and Graham Street are two-lane local roads that serve residential houses. Table 1 provides summarized information about existing roadway conditions and land uses of the surrounding area to the intersection. An existing condition diagram shown in Figure 2 includes pavement markings, traffic signs, signal configuration, land use, and roadway geometry. Additionally, photographs were taken at each approach to provide a detailed view of the intersection as shown in Figures 3-10.

Table 1
Existing Conditions
Big Tree Road and Golfview Boulevard / Graham Street

Feature	Description
Main Street	Big Tree Road
Side Street	Golfview Boulevard / Graham Street
Area Location	City of South Daytona, Volusia County, Florida
Adjacent Land Uses	Northeast: Residential house Northwest: Residential house Southwest: Residential house Southeast: Residential house
Traffic Control	Signalized with permissive phasing on all approaches.
Adjacent Signalized Intersections	US 1 is 0.5 miles east of study intersection. Magnolia Boulevard is 0.5 miles west of study intersection.
Big Tree Road	Cross Section: 2-lane rural collector with center two-way left-turn lane Posted Speed Limit: 35 mph Eastbound Approach Lanes: 1 left turn lane and 1 shared through / right turn lane Westbound Approach Lanes: 1 left turn lane and 1 shared through / right turn lane Pedestrian Crossings: Both approaches Alignment: Straight Sidewalks: South side of roadway Utilities: Located along the south side of the roadway Street Lighting: Located along the south side of the roadway
Golfview Boulevard	Cross Section: 2-lane local road Posted Speed Limit: None Southbound Approach Lanes: 1 shared left turn / through / right turn lane Pedestrian Crossings: None Sidewalks: Located along west side of the roadway Utilities: Located along west side of the roadway Street Lighting: Located along west side of the roadway
Graham Street	Cross Section: 2-lane local road Posted Speed Limit: None Northbound Approach Lanes: 1 shared left turn / through / right turn lane Pedestrian Crossing: Along the south side of the intersection Sidewalks: Located along west side of the roadway Utilities: Located along west side of the roadway Street Lighting: Located along west side of the roadway



BIG TREE ROAD AT GOLFVIEW BOULEVARD
DAYTONA BEACH - VOLUSIA COUNTY - FLORIDA

Symbols:

- Utility Pole
- Traffic Sign
- Street Name Sign
- Traffic Controller Cabinet
- Telecommunications Box
- Fire Hydrant
- Pedestrian Signal Pole
- Mitered End Section

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VOLUSIA TRANSPORTATION PLANNING ORGANIZATION

FIGURE 2
EXISTING CONDITION DIAGRAM

Figure 3
Photograph of Northbound Approach
(Looking Toward Intersection)
Graham Street at Big Tree Road

Figure 4
Photograph of Northbound Approach
(Looking Away from Intersection)
Graham Street at Big Tree Road

Figure 5
Photograph of Southbound Approach
(Looking Toward Intersection)
Golfview Boulevard at Big Tree Road

Figure 6
Photograph of Southbound Approach
(Looking Away from Intersection)
Golfview Boulevard at Big Tree Road

Figure 7
Photograph of Eastbound Approach
(Looking Toward Intersection)
Big Tree Road at Golfview Street / Graham Street

Figure 8
Photograph of Eastbound Approach
(Looking Away from Intersection)
Big Tree Road at Golfview Street / Graham Street

Figure 9
Photograph of Westbound Approach
(Looking Toward Intersection)
Big Tree Road at Golfview Street / Graham Street

Figure 10
Photograph of Westbound Approach
(Looking Away from Intersection)
Big Tree Road at Golfview Street / Graham Street

Traffic Volumes

Manual turning movement counts were collected at the intersection based on twenty-four hour automatically collected traffic volume data. The twenty-four hour count identified the eight (8) highest hours of volume entering the intersection which determined the periods of time to conduct manually collected turning movement counts.

According to the twenty-four hour count, the intersection has a total daily traffic volume of 6,294 vehicles consisting of 235 northbound; 894 southbound; 4,688 eastbound, and 4,196 westbound that entered the intersection.

Eight (8) hours of manual turning movement counts were collected from 7:00 a.m. to 9:00 a.m., 11:00 a.m. to 1:00 p.m., and 2:00 p.m. to 6:00 p.m. The data collected generated the following results:

- The intersection peak hour occurred from 5:00 p.m. to 6:00 p.m. 958 vehicles were counted entering the intersection during this peak hour with the following characteristics:
    - 871 vehicles entered the intersection on Big Tree Road
        - 397 vehicles were eastbound movements with the following distribution:
            - 1 left turn, 364 through and 32 right turn movements
        - 474 vehicles were westbound movements with the following distribution:
            - 40 left turn, 417 through, and 17 right turn movements
    - 71 vehicles were northbound movements from Graham Street with the following distribution:
        - 29 left turn, 4 through and 38 right turn movements
    - 16 vehicles were westbound movements from Golfview Boulevard with the following distribution:
        - 12 left turn, 3 through and 1 right turn movements

Thirty-seven pedestrians were observed traversing the intersection during the manual collected turning movement counts. Nineteen pedestrians crossed the west leg of the intersection while seventeen crossed the south leg.

Forty-one bicyclists entered the intersection during the manual collected turning movement counts. Seventeen bicycles were observed crossing Big Tree Road while twenty-four crossed either Golfview Boulevard or Graham Street.

Collision Data

Volusia Traffic Engineering provided crash data for the 36-month period between October 1, 2007 and September 30, 2010. Four (4) crashes were reported during the 36-month analysis period and consisted of the following crash types:

- Three (3) rear end and
- One (1) angle.

The crashes resulted in:

- Zero (0) fatalities and three (3) injuries;
- $8,400 in estimated property damage; and
- Zero (0) pedestrian and one (1) bicycle related collision occurred.

A detailed collision summary including crash type, time, date, roadway conditions, weather, and contributing cause of each individual crash is provided in Table 2.

Table 2
Collision Summary
Big Tree Road and Golfview Boulevard / Graham Street

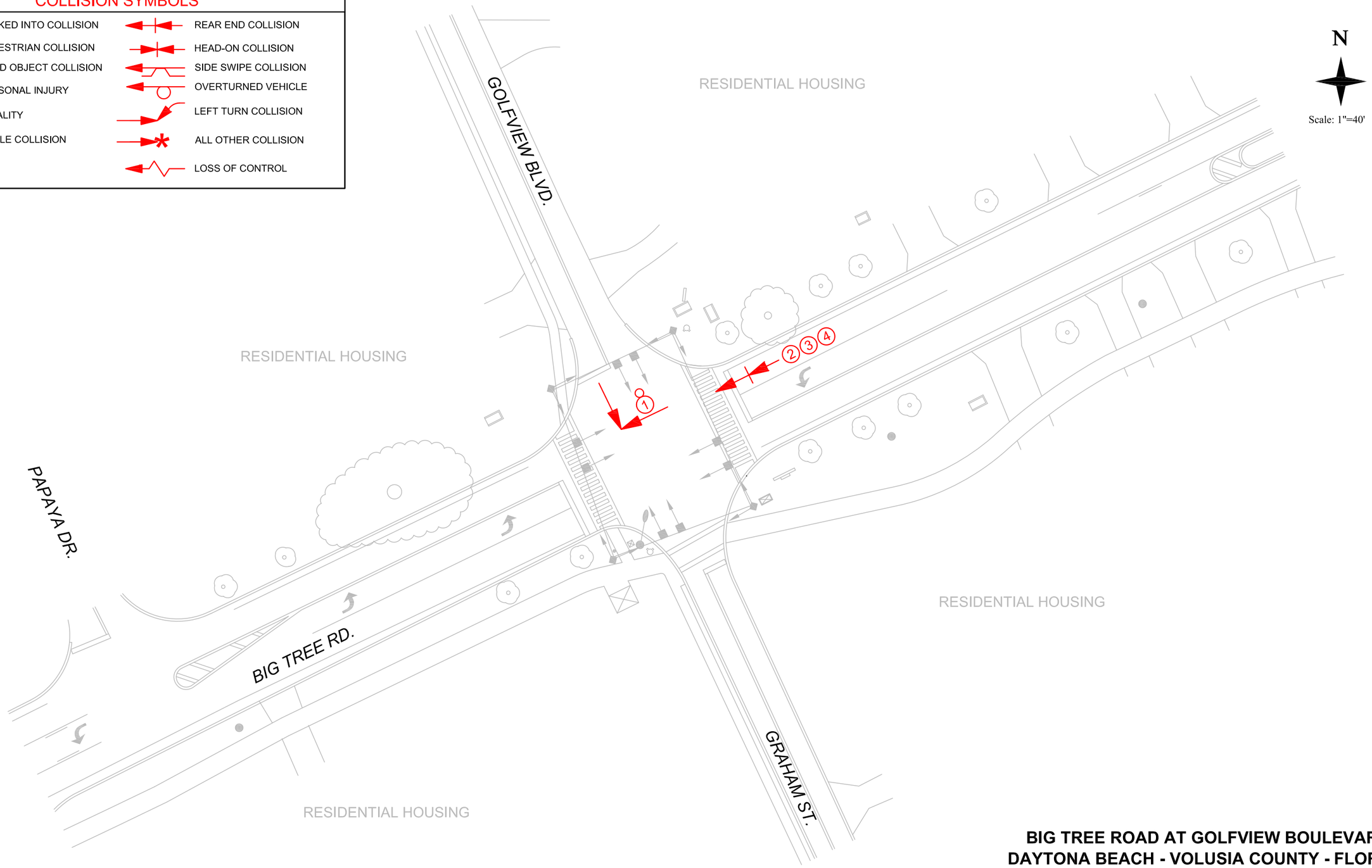
NO.	DATE	DAY	TIME	FATAL	INJURY	PROPERTY DAMAGE	HARMFUL EVENT	DUI	DAY / NIGHT	WET / DRY	CONTRIBUTING CAUSE
1	10/16/08	Thursday	20:01	0	3	$3,100	Angle	N	Night	Dry	Disregard Signal
2	01/05/09	Monday	17:54	0	0	$3,100	Rear-End	N	Night	Dry	Careless Driving
3	09/14/09	Monday	15:16	0	0	$500	Rear-End	N	Day	Dry	Careless Driving
4	10/30/09	Friday	17:20	0	0	$1,700	Rear-End	N	Day	Dry	Careless Driving
TOTAL				**0**	**3**	**$8,400**					

Total No.	Fatal	Injury	Property Damage	Angle	Overturned	Bicycle	Rear-End	Right Turn	Fixed Object	Backed Into	Left Turn
4	0	1	3	1	0	0	3	0	0	0	0
PERCENT	0%	25%	75%	25%	0%	0%	75%	0%	0%	0%	0%

CONTRIB-CAUSE	Day	Night	PAVEMENT CONDITION			Mechanical Failure	Disregard Signal	Careless Driving	FTYRW	Improper Backing	Followed Too Closely
			Wet	Dry	?						
TOTAL	2	2	0	4	0	0	1	3	0	0	0
PERCENT	50%	50%	0%	100%	0%	0%	25%	75%	0%	0%	0%

COLLISION SYMBOLS

- BACKED INTO COLLISION
- PEDESTRIAN COLLISION
- FIXED OBJECT COLLISION
- PERSONAL INJURY
- FATALITY
- ANGLE COLLISION
- REAR END COLLISION
- HEAD-ON COLLISION
- SIDE SWIPE COLLISION
- OVERTURNED VEHICLE
- LEFT TURN COLLISION
- ALL OTHER COLLISION
- LOSS OF CONTROL



BIG TREE ROAD AT GOLFVIEW BOULEVARD
DAYTONA BEACH - VOLUSIA COUNTY - FLORIDA

SYMBOLS:

Traffic Sign | Street Name Sign | Signal Head | Signal Pole

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VOLUSIA TRANSPORTATION PLANNING ORGANIZATION

FIGURE 11
COLLISION DIAGRAM
(10/1/07 - 9/30/10)

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QUALITATIVE ASSESSMENT

The intersection of Big Tree Road and Golfview Boulevard / Graham Street was observed during AM, mid-day and PM peak hours by a registered professional engineer to determine the intersection's current efficiency and safety with the goal to ascertain whether any changes are necessary to improve operational and safety characteristics of the intersection.

General Site Information:

- Big Tree Road is a two-lane rural collector that connects Nova Road to Ridgewood Avenue. Along the south side of the roadway an 8' asphalt sidewalk currently exists that will be reconstructed into a 10' trail to accommodate a combination of pedestrians, bicycles, and golf carts.
- Golfview Boulevard and Graham Street are two-lane local roads that serve residential houses.

Operations:

Observations: The following observations were made with respect to the operations of the study intersection:

- All approaches of the study intersection are currently signed and striped as a school zone. Typically, school zone signing and striping is provided on the main roadway, in this case Big Tree Road. Graham Street is one (1) of the roadways that provide vehicular circulation around the three (3) major traffic generators. It once provided pedestrian and bicycle access to South Daytona Elementary and two (2) religious institutions, however, fencing has been installed eliminating direct access and requiring students to either use Elizabeth Place and / or Kenilworth Avenue to enter or exit school. However, based on follow-up observations, the intersection is still used to cross school age children and includes a school crossing guard during the morning and afternoon school hours.
- The manual turning movement counts revealed no correlation between pedestrian and / or bicycle movements and school arrival or dismissal.
- A "RIGHT TURN YIELD TO PEDESTRIANS IN CROSSWALK" and a "YIELD TO PEDESTRIANS WHEN TURNING" signs are located respectively on the northwest and southwest corners. Neither signs are standard MUTCD design and the downward pointing equilateral triangle shape utilized in the northwest corner should only be used as a standard yield sign as described in the Standard Highway Signs and Markings book.
- Sight distance is adequate on all approaches of the intersection of Big Tree Road and Golfview Boulevard / Graham Street.

Safety:

Volusia County Traffic Engineering provided hard copies of the Florida Traffic Crash Reports for the thirty-six month period ending September 30, 2010 as shown in the data presented previously. A crash analysis was performed to determine and/or verify crash type, injury severity, location, and contributing cause. The following are observations based on crash reports, current field conditions, and engineering judgment.

- The four (4) vehicular crashes consisted of three (3) rear-end and one (1) angle which resulted in three (3) injuries.
- Three (3) rear-end collisions occurred during the study period, all of which are traffic signal related crashes. The crash reports do not imply that the configuration of the traffic signal is an issue.
- The one (1) angle collision was the result of a bicyclist heading south along Golfview Boulevard at night, disregarding the traffic signal at Big Tree Road and entering the path of a westbound motorcyclist and passenger. The driver of the motorcycle attempted an evasive maneuver but struck the bicyclist ejecting all parties and overturning the motorcycle in the process skidded approximately 500' before coming to a stop. Three (3) injuries resulted, all of which were non-incapacitating.
- There were no pedestrian crashes that occurred during the thirty-six study month period.

Volusia County Traffic Engineering Review / Analysis:

During a review of the initial draft study completed by TEDS, Volusia County Traffic Engineering Office used the data contained within and completed a traffic signal warrant analysis at the study intersection. The result of the County's analysis is as follows:

> *"The traffic pattern has changed at this intersection since direct access to the school is no longer allowed and the City recently prohibited freight traffic along Big Tree Road. As such, based upon the TMCs conducted by this study, the existing signal is not warranted when including all vehicle, pedestrian, and bicycle activity in the analysis and reviewing the crashes. Analysis indicates the signal causes more north/south delay than if a 2-way north/south stop control in the peak PM period. Refer to the attached Volusia County Signal Warrant analysis supplement, which was conducted independently of this Feasibility Report and attached as a supplement."(Appendix)*

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TRAFFIC SIGNAL CONCEPT

At the request of the City of South Daytona and as part of this study, conceptual mast arm signal poles were included on the improvement diagram (Figure 12) and a cost estimate located in Section 6 was developed. Additionally, striping and signing has been updated given current traffic and geometric conditions. Below is a summary of concepts to be incorporated:

- Double mast arm were utilized to minimize construction effort and reduce cost.
- Constructing the mast arm signal while maintaining current operations requires a temporary configuration. The box span should be converted to a diagonal span connecting from the northeast to southwest corners utilizing the existing concrete strain poles. Guy wiring should be installed to prevent strain pole movement which can lead to span wire sagging reducing signal clearance.
- Special emphasis crosswalks should be installed on the north and south legs of the intersection to provide pedestrian access on all approaches of the intersection. Providing this level of access requires the construction of complete pedestrian facilities including but not limited to concrete landing areas, ramps, countdown pedestrian signals, and push button detectors. All pedestrian facilities shall meet ADA guidelines.

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RECOMMENDATIONS

The study authorized by VTPO and conducted by TEDS is to determine if any safety and / or operational issues exist at the intersection of Big Tree Road and Golfview Boulevard / Graham Street in the City of South Daytona, Volusia County, Florida. Additionally, a concept for the installation of a mast arm traffic signal has been included as requested by the City of South Daytona.

The following recommendations are provided to provide a clear, concise, and consistent message to roadway users that improves operations and safety at the intersection along with upgrading the traffic signal with mast arm supports.

- **The "RIGHT TURN YIELD TO PEDESTRIANS IN CROSSWALK" and a "YIELD TO PEDESTRIANS WHEN TURNING" should be considered for removal as they are not MUTCD approved (unless there is a study on file justifying their use).**

Based on comments from Volusia County, the signal is not warranted due to the change in conditions related to school access. However, observations completed as part of a follow-up review confirmed school crossing guards are present during arrival and dismissal times for the elementary school. The City of South Daytona desires to retain the signalized intersection and move forward with upgrading the existing concrete strain pole box span configuration to a double mast arm setup along with the necessary pedestrian facilities to allow access across all approaches of the intersection (including the school crossing).

An improvement diagram shown in Figure 12 graphically illustrates the improvements described above along with a cost estimate in Section 6 of this report.

INSTALL MAST ARM MOUNTED TRAFFIC SIGNAL

REMOVE UPSTREAM SCHOOL ZONE PAVEMENT MARKINGS AND PEDESTRIAN SIGN ON GOLFVIEW BLVD AND GRAHAM STREET

REMOVE SIGNS

REMOVE STREET NAME SIGN WHEN MAST ARM SIGNAL IS CONSTRUCTED

REMOVE SIGNS

REMOVE RIGHT TURN YIELD SIGN REPLACE WITH SCHOOL CROSSING SIGN

GOLFVIEW BLVD.

PAPAYA DR.

BIG TREE RD.

GRAHAM ST.

RESIDENTIAL HOUSING

RESIDENTIAL HOUSING

RESIDENTIAL HOUSING

APPROXIMATE ROW

APPROXIMATE ROW

APPROXIMATE ROW

APPROXIMATE ROW

PEDESTRIAN CROSSING PUSH BUTTON

COVERED CONC. AREA WITH BENCHES

STOP

RIGHT TURN YIELD ON RED TO PEDESTRIANS IN CROSSWALK

N

Scale: 1"=40'

BIG TREE ROAD AT GOLFVIEW BOULEVARD
DAYTONA BEACH - VOLUSIA COUNTY - FLORIDA

SYMBOLS:

⊢ Traffic Sign ┼ Street Name Sign ◄■ Signal Head ■ Signal Pole

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VOLUSIA TRANSPORTATION PLANNING ORGANIZATION

FIGURE 12
IMPROVEMENT DIAGRAM

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COST ESTIMATE

A cost estimate shown in Table 3 was developed for the proposed intersection improvements utilizing a combination of FDOT Annual Statewide Averages, FDOT Six Month Moving Average, and cost estimates for similar project available to TEDS to determine unit cost.

Table 3
Cost Estimate
Big Tree Road and Golfview Boulevard / Graham Street

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
101-1	MOBILIZATION	LS	1	$6,542.33	$6,542.33
102-1	MAINTENANCE OF TRAFFIC	LS	1	$6,542.33	$6,542.33
522-1	SIDEWALK CONCRETE, 4" THICK	SY	112	$27.27	$3,054.24
555-1-1	DIRECTIONAL BORE, LESS THAN 6"	LF	320	$10.77	$3,446.40
630-1-12	CONDUIT, SIGNALS, F&I, UNDERGROUND	LF	820	$3.23	$2,648.60
632-7-1	CABLE - SIGNAL, F&I	PI	1	$2,580.21	$2,580.21
635-1-11	PULL & JUNCTION BOXES, F&I, PULL BOX	EA	10	$303.33	$3,033.30
635-1-16	PULL & JUNCTION BOXES, F&I, COMMUNICATIONS	EA	1	$1,888.42	$1,888.42
639-1-23	SIGNALS, ELECTRICAL POWER SERVICE, UNDERGROUND	AS	1	$1,032.72	$1,032.72
639-2-1	SIGNALS, ELECTRICAL SERVICE WIRE	LF	600	$1.45	$870.00
639-3-11	SIGNALS, ELECTRICAL SERVICE DISCONNECT, F&I, POLE MOUNT	EA	1	$272.30	$272.30
641-2-12	PRESTRESSED CONCRETE POLE, F&I, TYPE P-2 SERVICE POLE	EA	1	$755.04	$755.04
649-31-215	MAST ARM, F&I, WIND SPEED 130 MPH, DOUBLE ARM W/O LUMINAIRE - 46' - 60'	EA	2	$29,966.67	$59,933.34
650-51-312	TRAFFIC SIGNAL, F&I, 3 SECTION, 1 WAY LIGHTWEIGHT	AS	8	$698.43	$5,587.44
653-191	PEDESTRIAN SIGNAL, F&I, LED-COUNTDOWN, 1 DIRECTION	AS	4	$517.09	$2,068.36
653-192	PEDESTRIAN SIGNAL, F&I, LED-COUNTDOWN, 2 DIRECTIONS	EA	2	$1,005.88	$2,011.76
659-101	SIGNAL HEAD AUXILIARIES, F&I, BACK PLATES, 3 SECTION	EA	8	$106.96	$855.68
659-107	SIGNAL HEAD AUXILIARIES, F&I, ALUMINUM PEDESTAL	EA	2	$667.57	$1,335.14
660-1-101	LOOP DETECTOR, F&I, TYPE 1	EA	2	$118.00	$236.00
660-1-102	LOOP DETECTOR, F&I, TYPE 2	EA	2	$176.83	$353.66
660-2-102	LOOP ASSEMBLY, F&I, TYPE B	AS	2	$461.86	$923.72
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	AS	2	$578.24	$1,156.48
665-11	PEDESTRIAN DETECTOR, F&I, POLE MOUNTED DETECTOR & SIGN	EA	8	$128.29	$1,026.32
670-5-111	TRAFFIC CONTROLLER ASSEMBLY, F&I, NEMA, 1 PRE-EMPTION	AS	1	$21,796.49	$21,796.49
690-10	SIGNAL HEAD TRAFFIC ASSEMBLY REMOVAL	EA	8	$27.37	$218.96
690-20	SIGNAL PEDESTRIAN ASEMBLY REMOVAL	EA	8	$28.73	$229.84
690-32-1	POLE REMOVAL, SHALLOW DIRECT BURIAL	EA	4	$834.34	$3,337.36
690-50	CONTROLLER ASSEMBLY, REMOVE, COMPLETE ASSEMBLY	EA	1	$185.62	$185.62
690-70	DETECTOR PEDESTRIAN ASSEMBLY REMOVE	EA	10	$17.55	$175.50
690-80	SPAN WIRE ASSEMBLY REMOVAL	EA	4	$169.62	$678.48
690-90	CONDUIT & CABLING REMOVAL	PI	1	$252.54	$252.54
690-100	SIGNAL EQUIPMENT MISCELLANEOUS REMOVAL	PI	1	$316.61	$316.61
699-1-1	INTERNALLY ILLUMINATED SIGN, F&I, STREET NAME	EA	4	$2,750.91	$11,003.64
700-20-40	SINGLE POST SIGN, RELOCATE	AS	1	$107.94	$107.94
700-20-60	SINGLE POST SIGN, REMOVE	AS	4	$14.99	$59.96
711-11123	THERMOPLASTIC, STANDARD, WHITE, SOLID, 12"	LF	200	$1.98	$396.00
711-11125	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24"	LF	10	$4.04	$40.40
711-17	REMOVE EXISTING THERMOPLASTIC PAVEMENT MARKINGS	SF	30	$1.08	$32.40
	TWENTY PERCENT CONTINGENCY	LS	1	20 % OF SUBTOTAL	$29,397.11
	CONSTRUCTION COST			TOTAL	$176,382.64
	DESIGN FEE (15% OF CONSTRUCTION COST)			15% OF CONSTRUCTION COST	$26,457.40
	CEI FEE (7.5% OF CONSTRUCTION COST)			7.5% OF CONSTRUCTION COST	$13,228.70
				TOTAL	**$216,068.73**

APPENDIX

Traffic Engineering Data Solutions Inc
VOLUME SUMMARY
Tue 8/30/2011

Site Reference: Graham St.
Site ID: 000000000000
Location: Graham St. North Bound Approach

File: NB.prn
City:
County:

TIME	1 NORTH	Total
01:00	0	0
02:00	2	2
03:00	0	0
04:00	0	0
05:00	2	2
06:00	6	6
07:00	8	8
08:00	17	17
09:00	17	17
10:00	11	11
11:00	9	9
12:00	16	16
13:00	9	9
14:00	25	25
15:00	26	26
16:00	10	10
17:00	15	15
18:00	17	17
19:00	24	24
20:00	9	9
21:00	4	4
22:00	5	5
23:00	3	3
24:00	0	0
DAY TOTAL	235	235
PERCENTS	100.0%	100%
AM Times	07:30	
AM Peaks	20	
PM Times	13:45	
PM Peaks	34	
GRAND TOTAL	235	235
PERCENTS	100.0%	100%

Traffic Engineering Data Solutions Inc
VOLUME SUMMARY
Tue 8/30/2011

Site Reference: Golf View Bl
Site ID: 000000000000
Location: Golf View Blvd. South Bound Approach

File: SB.prn
City:
County:

TIME	1 SOUTH	Total
01:00	1	1
02:00	3	3
03:00	2	2
04:00	4	4
05:00	7	7
06:00	5	5
07:00	23	23
08:00	92	92
09:00	45	45
10:00	43	43
11:00	58	58
12:00	55	55
13:00	62	62
14:00	65	65
15:00	70	70
16:00	65	65
17:00	69	69
18:00	61	61
19:00	43	43
20:00	48	48
21:00	31	31
22:00	19	19
23:00	15	15
24:00	9	9
DAY TOTAL	895	895
PERCENTS	100.0%	100%
AM Times	07:30	
AM Peaks	93	
PM Times	13:45	
PM Peaks	89	
GRAND TOTAL	895	895
PERCENTS	100.0%	100%

Traffic Engineering Data Solutions Inc
VOLUME SUMMARY
Tue 8/30/2011

Site Reference: Big Tree Rd.
Site ID: 000000000000
Location: Big Tree Road East Bound Approach

File: EB.prn
City:
County:

TIME	1 EAST	Total
01:00	33	33
02:00	25	25
03:00	19	19
04:00	5	5
05:00	18	18
06:00	35	35
07:00	103	103
08:00	373	373
09:00	365	365
10:00	294	294
11:00	277	277
12:00	298	298
13:00	295	295
14:00	311	311
15:00	421	421
16:00	372	372
17:00	297	297
18:00	332	332
19:00	262	262
20:00	177	177
21:00	134	134
22:00	119	119
23:00	85	85
24:00	57	57
DAY TOTAL	4707	4707
PERCENTS	100.0%	100%
AM Times	07:30	
AM Peaks	463	
PM Times	14:30	
PM Peaks	436	
GRAND TOTAL	4707	4707
PERCENTS	100.0%	100%

Traffic Engineering Data Solutions Inc
VOLUME SUMMARY
Tue 8/30/2011

Site Reference: Big Tree Rd.
Site ID: 000000000000
Location: Big Tree Road West Bound Approach

File: WB.prn
City:
County:

TIME	1 WEST	Total
01:00	33	33
02:00	13	13
03:00	19	19
04:00	10	10
05:00	16	16
06:00	29	29
07:00	68	68
08:00	183	183
09:00	253	253
10:00	220	220
11:00	240	240
12:00	267	267
13:00	333	333
14:00	313	313
15:00	317	317
16:00	366	366
17:00	340	340
18:00	378	378
19:00	246	246
20:00	187	187
21:00	143	143
22:00	115	115
23:00	77	77
24:00	36	36
DAY TOTAL	4202	4202
PERCENTS	100.0%	100%
AM Times	11:00	
AM Peaks	269	
PM Times	17:00	
PM Peaks	411	
GRAND TOTAL	4202	4202
PERCENTS	100.0%	100%

FLORIDA DEPARTMENT OF TRANSPORTATION

SUMMARY OF VEHICLE MOVEMENTS

SECTION **CITY** South Daytona **COUNTY** Volusia

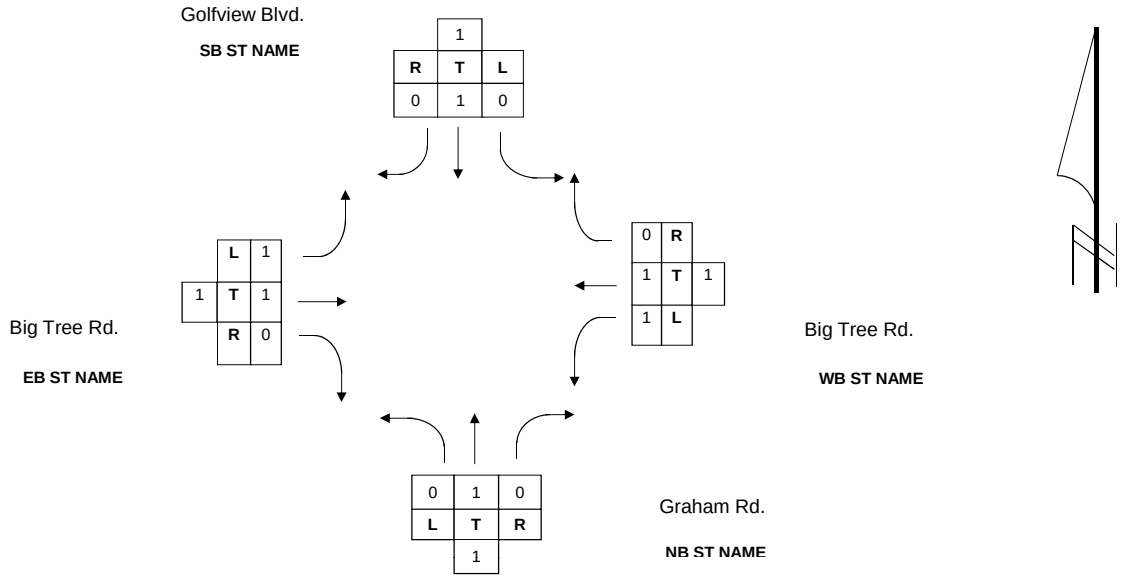
STATE ROUTE Big Tree Rd. **INTERSECTING ROUTE** Golfview/Graham Rd.

OBSERVER DM **DATE** 9/15/2011 **MILEPOST**

WEATHER Sunny **ROAD CONDITION** Good

REMARKS

FORM COMPLETED BY PHF **DATE** 10/06/11



TIME	NORTHBOUND					SOUTHBOUND					TOTAL	EASTBOUND					WESTBOUND					TOTAL
BEGIN/END	L	T	R	U	TOT	L	T	R	U	TOT	N/S	L	T	R	U	TOT	L	T	R	U	TOT	E/W
7 - 8	16	9	2	0	**27**	11	15	50	0	**76**	**103**	41	343	8	0	**392**	0	207	7	0	**214**	**606**
8 - 9	9	2	1	0	**12**	15	2	24	0	**41**	**53**	32	285	6	1	**324**	1	229	14	0	**244**	**568**
11 - 12	3	7	2	0	**12**	22	4	28	0	**54**	**66**	21	314	5	0	**340**	0	271	24	0	**295**	**635**
12 - 1	14	5	0	0	**19**	19	1	30	0	**50**	**69**	23	296	9	0	**328**	2	292	23	0	**317**	**645**
2 - 3	12	14	1	0	**27**	33	14	39	0	**86**	**113**	45	344	10	0	**399**	2	324	26	0	**352**	**751**
3 - 4	9	8	2	0	**19**	23	3	39	0	**65**	**84**	32	306	11	0	**349**	2	337	28	0	**367**	**716**
4 - 5	15	8	3	0	**26**	38	8	36	0	**82**	**108**	26	297	15	0	**338**	0	323	33	0	**356**	**694**
5 - 6	12	3	1	0	**16**	29	4	38	0	**71**	**87**	40	417	17	0	**474**	1	364	32	0	**397**	**871**
TOTAL	**90**	**56**	**12**	**0**	158	**190**	**51**	**284**	**0**	525	**683**	**260**	**2602**	**81**	**1**	2944	**8**	**2347**	**187**	**0**	2542	**5486**

FLORIDA DEPARTMENT OF TRANSPORTATION

PEDESTRIAN MOVEMENT SUMMARY

SECTION | **CITY** South Daytona | **COUNTY** Volusia

STATE ROUTE Big Tree Rd. | **INTERSECTING ROUTE** Golfview/Graham Rd.

OBSERVER DM | **DATE** 9/15/2011

REMARKS

FORM COMPLETED BY PHF **DATE** 10/06/11

Golfview Blvd.

SB ST NAME

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

7-8	3	3	**6**
8-9	1	1	**2**
11-12	0	2	**2**
12-1	0	0	**0**
2-3	0	3	**3**
3-4	0	1	**1**
4-5	3	2	**5**
5-6	0	0	**0**
Total	**7**	**12**	**19**

Big Tree Rd.

EB ST NAME

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

Big Tree Rd.

WB ST NAME

7-8	8-9	11-12	12-1	2-3	3-4	4-5	5-6	Total
1	2	1	1	1	1	0	0	**7**
0	2	3	1	3	1	0	0	**10**
1	**4**	**4**	**2**	**4**	**2**	**0**	**0**	**17**

Graham Rd.

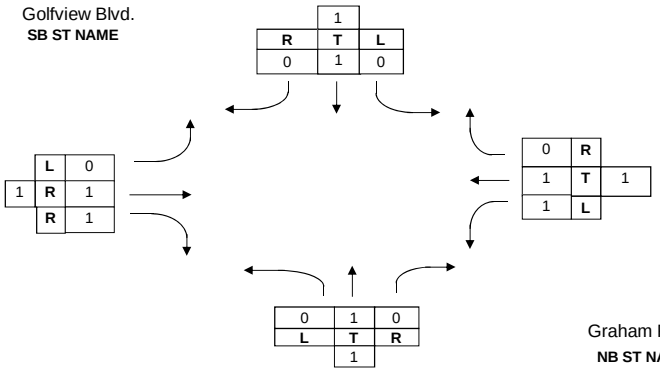
NB ST NAME

FLORIDA DEPARTMENT OF TRANSPORTATION

SUMMARY OF BICYCLE MOVEMENTS

SECTION
CITY South Daytona **COUNTY** Volusia
STATE ROUTE Big Tree Rd. **INTERSECTING ROUTE** Golfview/Graham Rd.
OBSERVER DM **DATE** 9/15/2011 **MILEPOST**
WEATHER Sunny **ROAD CONDITION** Good
REMARKS

FORM COMPLETED BY PHF **DATE** 10/06/11



TIME	NORTHBOUND					SOUTHBOUND					TOTAL	EASTBOUND					WESTBOUND					TOTAL
BEGIN/END	L	T	R	U	TOT	L	T	R	U	TOT	N/S	L	T	R	U	TOT	L	T	R	U	TOT	E/W
7 - 8		5			5		0			0	5		0			0		1			0	0
8 - 9		1			1		0			0	1		3			3		2			0	3
11 - 12		1			1		0			0	1		3			3		3			0	3
12 - 1		0			0		0			0	0		1			1		1			0	1
2 - 3		1			1		5			5	6		3			3		1			0	3
3 - 4		0			0		1			1	1		2			2		2			0	2
4 - 5		0			0		1			1	1		5			5		2			0	5
5 - 6		2			2		0			0	2		7			7		4			0	7
TOTAL	0	10	0	0	10	0	7	0	0	7	17	0	24	0	0	24	0	16	0	0	0	24

Warrant		Applicable	Satisfied	Comments
1A	Minimum Vehicular Volume	Yes	No	The side street traffic volumes do not meet the 100% or 80% requirements of this warrant.
1B	Interruption of Continuous Traffic	Yes	No	The side street traffic volumes do not meet the 100% or 80% requirements of this warrant.
2	Four Hour Vehicular Volume	Yes	No	The side street traffic volumes meet the requirements of this warrant.
3A	Peak Hour Delay	Yes	No	This warrant is not satisified by the level of delay experienced by motorists on the side street.
3B	Peak Hour Volume	Yes	No	The side street traffic volumes meet the requirements of this warrant.
4	Pedestrian Volume	Yes	No	The pedestrian volumes do not satisfy this warrant.
5	School Crossing	Yes	No	This warrant is not applicable, as no school zone exists at the intersection.
6	Coordinated Signal System	No	No	This warrant is not applicable as this intersection is not within a coordinated signal system.
7	Crash Experience	Yes	No	This warrant is not satisfied as there were not at least five crashes potentially correctable by a traffic signal that occurred within the 12-month study period.
8	Roadway Network	No	No	This warrant is not applicable, as this intersection is not considered to be part of a coordinated network.

Exhibit 4

TRAFFIC SIGNAL WARRANT SUMMARY

City: South Daytona
County: Volusia
Engineer: MT/JEC
Date: November 2, 2011

Major Street: Big Tree Road — Lanes: 1 — Critical Approach Speed: 35
Minor Street: Golfview/Graham Rd — Lanes: 1

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ■ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ■ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ■ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ■ No
80% / 56% Satisfied: ☐ Yes ■ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
Approach Lanes	1		2 or more		700	800	1100	1200	1400	1500	1600	1700
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	500 (400)	350 (280)*	600 (480)	420 (336)*	606	568	635	645	751	716	694	871
Highest Approach on Minor Street	150 (120)	105 (84)*	200 (160)	140 (112)*	79	42	54	50	86	65	85	71

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is (80%) / (56%) satisfied if parenthetical volumes are met for eight hours.*

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay or conflict.

Applicable: ■ Yes ☐ No
Excessive Delay/Conflict: ■ Yes ☐ No
100% Satisfied: ☐ Yes ■ No
80% / 56% Satisfied: ☐ Yes ■ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets) {56% Shown in Brackets}				Eight Highest Hours							
Approach Lanes	1		2 or more		700	800	1100	1200	1400	1500	1600	1700
Volume Level	100%	70%	100%	70%								
Both Approaches on Major Street	750 (600)	525 (420)*	900 (720)	630 (504)*	606	568	635	645	751	716	694	871
Highest Approach on Minor Street	75 (60)	53 (42)*	100 (80)	70 (56)*	79	42	54	50	86	65	85	71

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is (80%) / (56%) satisfied if parenthetical volumes are met for eight hours.*

Source: Revised from NCHRP Report 457

TRAFFIC SIGNAL WARRANT SUMMARY

City: **South Daytona** Engineer: **MT/JEC**
County: **Volusia** Date: **November 2, 2011**

Major Street: **Big Tree Road** Lanes: **1** Critical Approach Speed: **35**
Minor Street: **Golfview/Graham Rd** Lanes: **1**

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ■ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ■ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ■ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

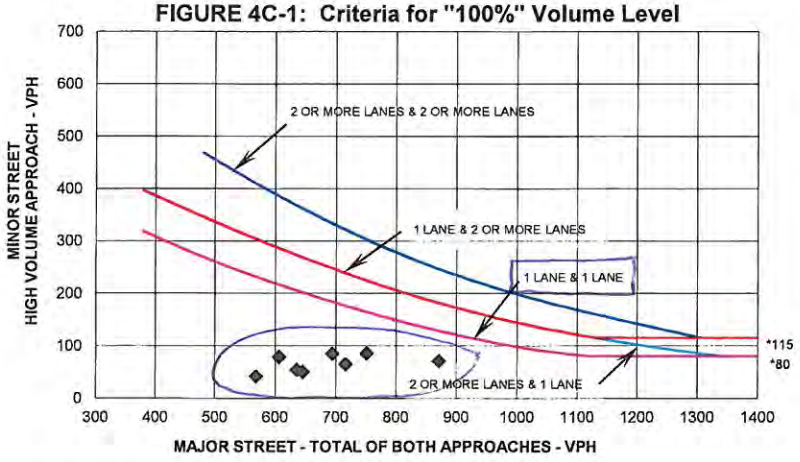
If any four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

Plot four volume combinations on the applicable figure below.

Warranting Volumes			Met	
Hour	Major Street	Minor Street	100%	70%
700	606	79		
800	568	42		
1100	635	54		
1200	645	50		
1400	751	86		■
1500	716	65		
1600	694	85		■
1700	871	71		■

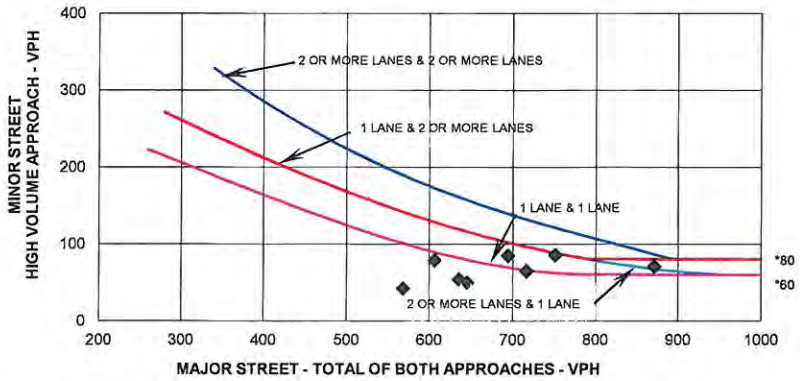
FIGURE 4C-1: Criteria for "100%" Volume Level



** Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



** Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

Source: Revised from NCHRP Report 457

Exhibit 6

TRAFFIC SIGNAL WARRANT SUMMARY

City: South Daytona
County: Volusia
Engineer: MT/JEC
Date: November 2, 2011

Major Street: Big Tree Road — Lanes: 1 — Critical Approach Speed: 35
Minor Street: Golfview/Graham Rd — Lanes: 1

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ☐ Yes ■ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ■ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ☐ 70% ■ 100%

WARRANT 3 - PEAK HOUR

Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

If all three criteria are fullfilled or any of the plotted points lie above the appropriate line, then the warrant is satisfed.

Unusual condition justifying use of warrant:

None

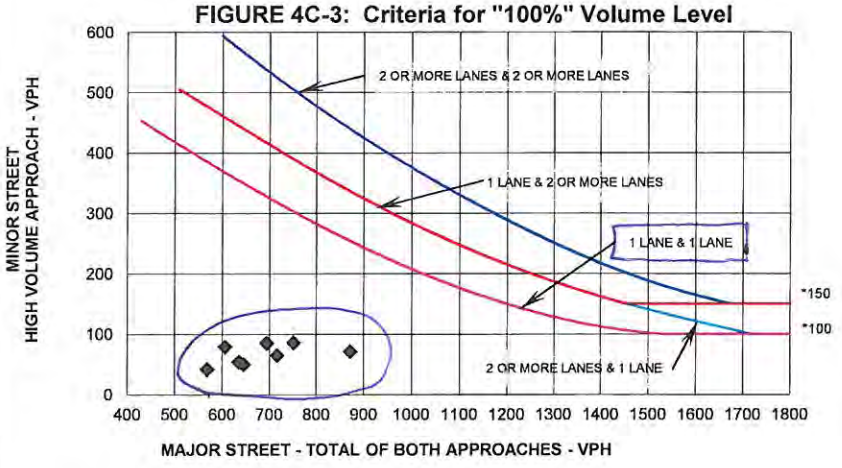
Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Warranting Volumes			100%	70%
700	606	79		
800	568	42		
1100	635	54		
1200	645	50		
1400	751	86		
1500	716	65		
1600	694	85		
1700	871	71		

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*	0.3	0.0
Fulfilled?: ☐ Yes ■ No		
2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	71	0
Fulfilled?: ☐ Yes ■ No		
3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	0	942
Fulfilled?: ■ Yes ☐ No		

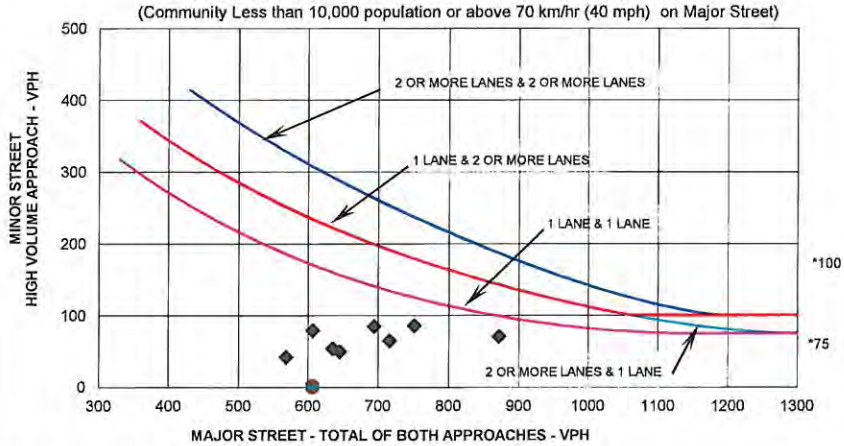
Plot volume combination on the applicable figure below.

FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



** Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

Source: Revised from NCHRP Report 457

TRAFFIC SIGNAL WARRANT SUMMARY

City: **South Daytona** Engineer: **MT/JEC**
County: **Volusia** Date: **November 2, 2011**

Major Street: **Big Tree Road** Lanes: **1** Critical Approach Speed: **35**
Minor Street: **Golfview/Graham Rd** Lanes: **1**

WARRANT 4 - PEDESTRIAN VOLUME

Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Criteria	Hour	Pedestrian Volume	Pedestrian Gaps	Fulfilled? Yes	Fulfilled? No
1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	700	6	0		■
	800	2	0		
	1400	3	0		
	1600	5	0		
2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour and there are less than 60 gaps per hour in the major street traffic stream of adequate length.	700	12	0		■
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				■	

WARRANT 5 - SCHOOL CROSSING

Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Criteria				Fulfilled? Yes	Fulfilled? No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students: 11	Hour: 1			■
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period.		Minutes: 0	Gaps: 0		■
3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic.				■	

WARRANT 6 - COORDINATED SIGNAL SYSTEM

Applicable: ☐ Yes ■ No
Satisfied: ☐ Yes ■ No

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Criteria	Fulfilled? Yes	Fulfilled? No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.	■	
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		■

Source: Revised from NCHRP Report 457

Exhibit 8

TRAFFIC SIGNAL WARRANT SUMMARY

City: **South Daytona** Engineer: **MT/JEC**
County: **Volusia** Date: **November 2, 2011**

Major Street: **Big Tree Road** Lanes: **1** Critical Approach Speed: **35**
Minor Street: **Golfview/Graham Rd** Lanes: **1**

WARRANT 7 - CRASH EXPERIENCE

Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Criteria		Hour	Volume	Met? Yes	Met? No	Fulfilled? Yes	Fulfilled? No
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)				■		
	Warrant 1, Condition B (80% satisfied)				■		
	Warrant 4, Pedestrian Volume at 80% of volume requirements: 80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour	700	5		■		■
		800	2				
		1400	2				
		1600	4				
2. Adequate trial of other remedial measure has failed to reduce crash frequency.		Measure tried:	None				■
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period.		Number of crashes per 12 months:	1				■

WARRANT 8 - ROADWAY NETWORK

Applicable: ☐ Yes ■ No
Satisfied: ☐ Yes ■ No

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Criteria							Met? Yes	Met? No	Fulfilled? Yes	Fulfilled? No
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.			Entering Volume: 3,095			■			■
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.		Warrant:	1	2	3		■		
			Satisfied?:	NO	NO	NO				
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)	N/A	N/A	N/A	N/A	N/A	← Hour				■
	N/A	N/A	N/A	N/A	N/A	← Volume				

Characteristics of Major Routes		Met? Yes	Met? No	Fulfilled? Yes	Fulfilled? No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:	■			■
	Minor Street:		■		
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:		■		
	Minor Street:		■		
3. Appears as a major route on an official plan.	Major Street:	■			
	Minor Street:		■		

CONCLUSIONS

Warrants Satisfied: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Remarks: Volumes include vehicles, pedestrians, & bicycles crossing Big Tree Rd from Golfview.

Source: Revised from NCHRP Report 457

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst		Intersection	Golfview/Graham
Agency or Co.	Volusia Co TE	Area Type	All other areas
Date Performed	11/2/2011	Jurisdiction	S Daytona
Time Period	PM Peak	Analysis Year	2011
		Project ID	Big Tree - Existing Signal Control

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1	1	1		1	1		0	1	0	0	1	0
Lane Group	L	T		L	T			LTR			LTR	
Volume, V (vph)	40	434		1	396		12	3	1	29	4	38
% Heavy Vehicles, %HV	0	0		0	0		0	0	0	0	0	0
Peak-Hour Factor, PHF	0.90	0.90		0.90	0.90		0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or Actuated (A)	A	A		A	A		A	A	A	A	A	A
Start-up Lost Time, l_1	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of Effective Green, e	4.0	4.0		4.0	4.0			4.0			4.0	
Arrival Type, AT	3	3		3	3			3			3	
Unit Extension, UE	4.0	4.0		4.0	4.0			4.0			4.0	
Filtering/Metering, I	1.000	1.000		1.000	1.000			1.000			1.000	
Initial Unmet Demand, Q_b	0.0	0.0		0.0	0.0			0.0			0.0	
Ped / Bike / RTOR Volumes	0	0		0	0		0	0	0	0	0	0
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N_m												
Buses Stopping, N_B	0	0		0	0			0			0	
Min. Time for Pedestrians, G_p	13.5			13.5			10.1			10.1		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 45.0	G = 0.0	G = 0.0	G = 0.0	G = 20.0	G = 0.0	G = 0.0	G = 0.0
	Y = 5	Y = 0	Y = 0	Y = 0	Y = 5	Y = 0	Y = 0	Y = 0
Duration of Analysis, T = 0.25						Cycle Length, C = 75.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	44	482		1	440			17			78	
Lane Group Capacity, c	526	1191		492	1191			475			468	
v/c Ratio, X	0.08	0.40		0.00	0.37			0.04			0.17	
Total Green Ratio, g/C	0.63	0.63		0.63	0.63			0.29			0.29	
Uniform Delay, d_1	5.5	7.0		5.2	6.8			18.9			19.7	
Progression Factor, PF	1.000	1.000		1.000	1.000			1.000			1.000	
Delay Calibration, k	0.15	0.15		0.15	0.15			0.15			0.15	
Incremental Delay, d_2	0.1	0.3		0.0	0.3			0.0			0.2	

Initial Queue Delay, d_3	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay	5.6	7.3		5.2	7.1			19.0			19.9	
Lane Group LOS	A	A		A	A			B			B	
Approach Delay	7.2			7.1			19.0			19.9		
Approach LOS	A			A			B			B		
Intersection Delay	8.2			X_c = 0.33			Intersection LOS			A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JEC	Intersection	Golfview Blvd
Agency/Co.	Volusia Co TE	Jurisdiction	South daytona
Date Performed	11/2/2011	Analysis Year	2011
Analysis Time Period	Existing PM Peak		
Project Description	Conversion to 2 way stop		
East/West Street:	Big Tree Rd	North/South Street:	Golfview/Graham
Intersection Orientation:	East-West	Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	40	434		1	396	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	40	434	0	1	396	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L	T		L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	12	3	1	29	4	38
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	12	3	1	29	4	38
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	40	1		16			71	
C (m) (veh/h)	1174	1136		336			471	
v/c	0.03	0.00		0.05			0.15	
95% queue length	0.11	0.00		0.15			0.53	
Control Delay (s/veh)	8.2	8.2		16.2			14.0	
LOS	A	A		C			B	
Approach Delay (s/veh)	--	--	16.2			14.0		
Approach LOS	--	--	C			B		

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