

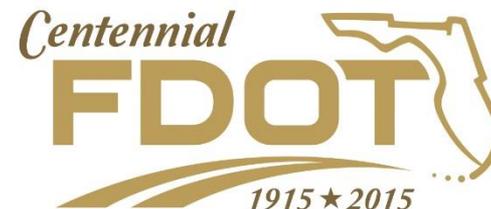
# 2015

## Quality/Level of Service Training

Planning Level Analysis

Problem Set

April 2015



# Data Sources Example 1

Find the following parameters for Interstate I-4 in Orlando (D5) between Princeton St and Par St:

- Area Type
- Peak Direction
- AADT
- K-Factor
- D-Factor
- % Heavy Vehicles

# Data Sources Example 1

## Answer Sheet

- Area Type = \_\_\_\_\_
- AADT = \_\_\_\_\_
- K-Factor = \_\_\_\_\_
- D-Factor = \_\_\_\_\_
- Peak Direction = \_\_\_\_\_
- % Heavy Vehicles = \_\_\_\_\_

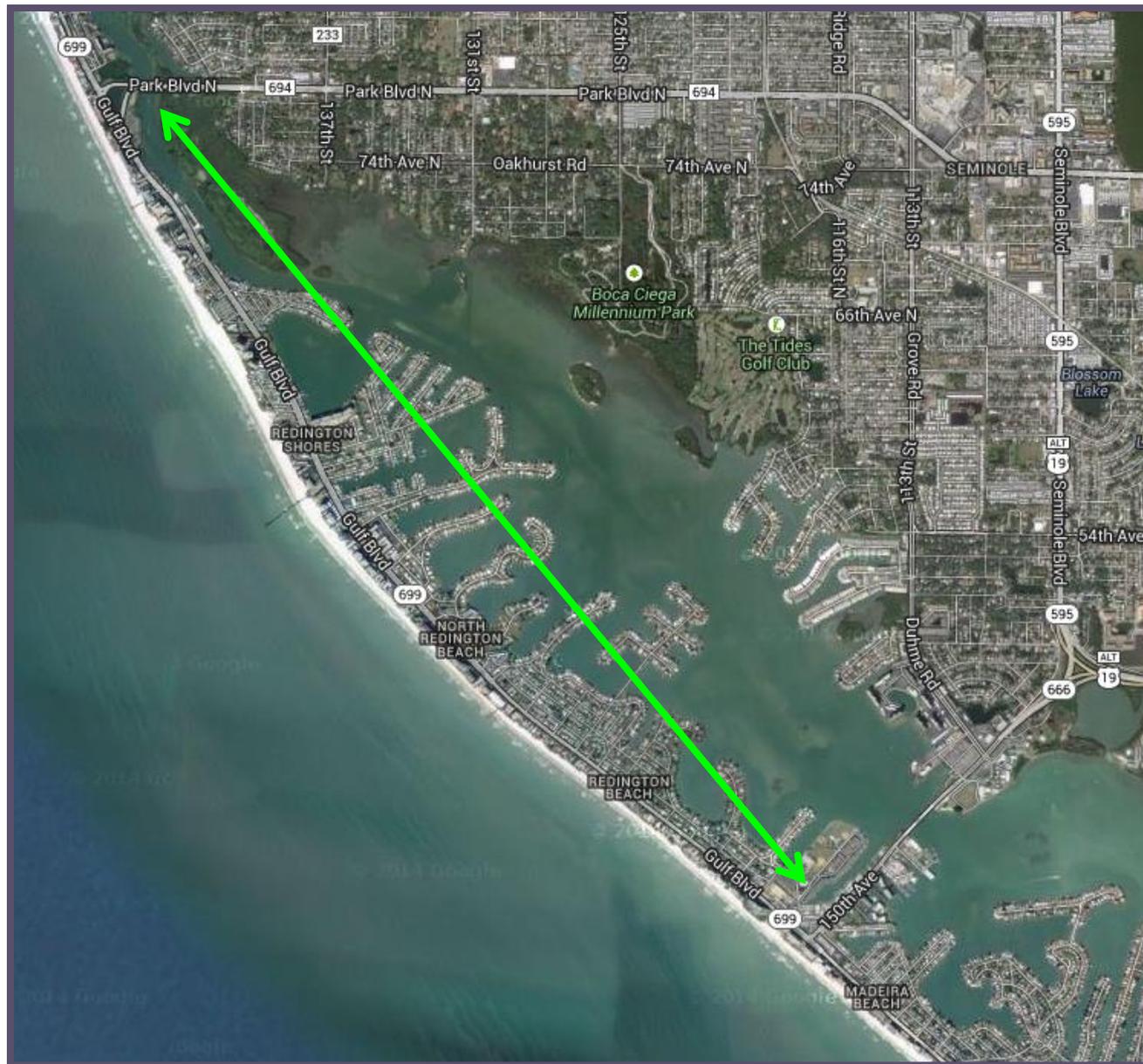
# Data Sources Workshop 1

## SR 699

- Between Park Blvd and SR 666
- Redington Beach (D7 – North of Madera Beach)

## Identify:

- Area Type
- AADT, K-Factor, D-Factor
- Peak Direction
- % Heavy Vehicles



# Data Sources Workshop 1

## Answer Sheet

- Area Type = \_\_\_\_\_
- AADT = \_\_\_\_\_
- K-Factor = \_\_\_\_\_
- D-Factor = \_\_\_\_\_
- Peak Direction = \_\_\_\_\_
- % Heavy Vehicles = \_\_\_\_\_

# GSVT Example 1.A

Determine the max. service volume for LOS E:

- In terms of AADT
- In a core urbanized area
- For a 8-lane freeway

FREEWAYS					
Core Urbanized					
Lanes	B	C	D	E	
4	47,400	64,000	77,900	84,600	
6	69,900	95,200	116,600	130,600	
8	92,500	126,400	154,300	176,600	
10	115,100	159,700	194,500	222,700	
12	162,400	216,700	256,600	268,900	

TABLE 1 Generalized Annual Average Daily Volumes for Florida's Urbanized Areas

INTERRUPTED FLOW FACILITIES										UNINTERRUPTED FLOW FACILITIES									
STATE SIGNALIZED ARTERIALS										FREEWAYS									
Class I (40 mph or higher posted speed limit)										Core Urbanized									
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	Lanes	B	C	D	E				
2	Undivided	16,800	17,700	17,700	17,700	4	47,400	64,000	77,900	84,600	4	47,400	64,000	77,900	84,600				
4	Divided	37,900	39,800	39,800	39,800	6	69,900	95,200	116,600	130,600	6	69,900	95,200	116,600	130,600				
6	Divided	58,400	59,900	59,900	59,900	8	92,500	126,400	154,300	176,600	8	92,500	126,400	154,300	176,600				
8	Divided	78,800	80,100	80,100	80,100	10	115,100	159,700	194,500	222,700	10	115,100	159,700	194,500	222,700				
Class II (35 mph or slower posted speed limit)										Urbanized									
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	Lanes	B	C	D	E				
2	Undivided	7,300	14,800	15,600	15,600	4	45,800	61,500	74,400	79,900	4	45,800	61,500	74,400	79,900				
4	Divided	14,500	32,400	33,800	33,800	6	68,100	93,000	111,800	123,300	6	68,100	93,000	111,800	123,300				
6	Divided	21,300	50,000	50,900	50,900	8	91,500	123,500	148,700	166,800	8	91,500	123,500	148,700	166,800				
8	Divided	32,000	67,500	68,100	68,100	10	114,800	156,000	187,100	210,300	10	114,800	156,000	187,100	210,300				
Non-State Signalized Roadway Adjustments										Freeway Adjustments									
(After corresponding area volume is by the indicated percent)										Auxiliary Lanes									
Non-State Signalized Roadways -10%										Present in Both Directions									
										+20%									
Median & Turn Lane Adjustments										UNINTERRUPTED FLOW HIGHWAYS									
Lanes	Median	Enclosure	Enclosure	Adjustment	Lanes	Median	B	C	D	E	Lanes	Median	B	C	D	E			
2	Undivided	Yes	No	-5%	2	Undivided	8,600	17,000	24,200	33,300	2	Undivided	8,600	17,000	24,200	33,300			
4	Undivided	No	No	-20%	4	Divided	36,700	51,800	63,600	72,800	4	Divided	36,700	51,800	63,600	72,800			
Multi	Undivided	Yes	No	-5%	6	Divided	55,000	77,700	98,300	108,800	6	Divided	55,000	77,700	98,300	108,800			
Multi	Undivided	No	Yes	-25%	Uninterrupted Flow Highway Adjustments														
				-5%	Lanes	Median	Enclosure	Left Lane	Adjustment	Lanes	Median	Enclosure	Left Lane	Adjustment	Lanes	Median	Enclosure	Left Lane	Adjustment
				-5%	2	Divided	Yes	Yes	-5%	2	Divided	Yes	Yes	-5%	2	Divided	Yes	Yes	-5%
				-5%	Multi	Undivided	Yes	No	-5%	Multi	Undivided	Yes	No	-5%	Multi	Undivided	Yes	No	-5%
				-5%	Multi	Undivided	No	Yes	-25%	Multi	Undivided	No	Yes	-25%	Multi	Undivided	No	Yes	-25%
One-Way Facility Adjustment										BICYCLE MODE <sup>1</sup>									
Multiply the corresponding two-direction volumes in this table by 0.6										Obtains unadjusted vehicle volumes (shown below by number of directional roadway lanes to determine the way direction service volumes.)									
										Shoulder/Bicycle Lane Coverage									
										0-49%									
										50-84%									
										85-100%									
										PEDESTRIAN MODE <sup>2</sup>									
										Obtains unadjusted vehicle volumes (shown below by number of directional roadway lanes to determine the way direction service volumes.)									
										Sidewalk Coverage									
										0-49%									
										50-84%									
										85-100%									
										BUS MODE (Scheduled Fixed Route) <sup>3</sup>									
										Obtain in peak hour by peak direction									
										Sidewalk Coverage									
										0-84%									
										85-100%									

1. Values shown are presented as two-way average daily volumes for the level of service and for the corresponding peak-hour traffic specifically stated. The values shown are maximum values and should be used only for planning applications. The computer model from which the values are derived should be used for more detailed analyses. The values and the corresponding volume shown are for the number of lanes in the direction of travel. Values shown include the volume of the roadway and the volume of the shoulder. Values shown are for the level of service and the level of service shown. Values shown are for the level of service and the level of service shown. Values shown are for the level of service and the level of service shown.

2. Values shown are presented as two-way average daily volumes for the level of service and for the corresponding peak-hour traffic specifically stated. The values shown are maximum values and should be used only for planning applications. The computer model from which the values are derived should be used for more detailed analyses. The values and the corresponding volume shown are for the number of lanes in the direction of travel. Values shown include the volume of the roadway and the volume of the shoulder. Values shown are for the level of service and the level of service shown. Values shown are for the level of service and the level of service shown.

3. Values shown are presented as two-way average daily volumes for the level of service and for the corresponding peak-hour traffic specifically stated. The values shown are maximum values and should be used only for planning applications. The computer model from which the values are derived should be used for more detailed analyses. The values and the corresponding volume shown are for the number of lanes in the direction of travel. Values shown include the volume of the roadway and the volume of the shoulder. Values shown are for the level of service and the level of service shown. Values shown are for the level of service and the level of service shown.

\*\* This applies to the level of service shown. For the network to be used, values greater than level of service D should be used. For the network to be used, values greater than level of service D should be used. For the network to be used, values greater than level of service D should be used. For the network to be used, values greater than level of service D should be used.

Source: Florida Department of Transportation, Florida Planning Unit, [www.floridadepartmentoftransportation.com/plan/plan.htm](http://www.floridadepartmentoftransportation.com/plan/plan.htm)

2012 FOOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES

# GSVT Example 1.B

Determine the max. service volume for LOS E:

- In terms of AADT
- In a core urbanized area
- For a 8-lane freeway
- Auxiliary lanes in both directions

FREEWAYS				
Core Urbanized				
Lanes	B	C	D	E
4	47,400	64,000	77,900	84,600
6	69,900	95,200	116,600	130,600
8	92,500	126,400	154,300	176,600
10	115,100	159,700	194,500	222,700
12	162,400	216,700	256,600	268,900

Freeway Adjustments				
Auxiliary Lanes Present in Both Directions + 20,000		Ramp Metering + 5%		

TABLE 1 Generalized Annual Average Daily Volumes for Florida's Urbanized Areas

INTERRUPTED FLOW FACILITIES					UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS					FREEWAYS					
Class I (40 mph or higher posted speed limit)					Core Urbanized					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E
2	Undivided	*	16,800	17,700	**	4	47,400	64,000	77,900	84,600
4	Divided	*	37,900	39,800	**	6	69,900	95,200	116,600	130,600
6	Divided	*	58,400	59,900	**	8	92,500	126,400	154,300	176,600
8	Divided	*	78,800	80,100	**	10	115,100	159,700	194,500	222,700
						12	162,400	216,700	256,600	268,900
Class II (35 mph or slower posted speed limit)					Urbanized					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E
2	Undivided	*	7,300	14,800	15,600	4	45,800	61,500	74,400	79,900
4	Divided	*	14,500	32,400	33,800	6	68,100	93,000	111,800	123,300
6	Divided	*	23,300	50,000	50,900	8	91,500	123,500	148,700	166,800
8	Divided	*	32,000	67,300	68,100	10	114,800	156,000	187,100	210,300

Non-State Signalized Roadway Adjustments		Freeway Adjustments	
(Alter corresponding state volumes by the indicated percent)		Auxiliary Lanes Present in Both Directions +20,000	
Non-State Signalized Roadways -10%		Ramp Metering +5%	

UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	B	C	D	E
2	Undivided	8,600	17,000	24,200	33,300
4	Divided	36,700	51,800	65,600	72,600
6	Divided	55,000	77,700	98,300	108,800

Uninterrupted Flow Highway Adjustments			
Lanes	Median	Exclusive left lanes	Adjustment factor
2	Divided	Yes	-5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

BICYCLE MODE <sup>2</sup>				
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)				
Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	2,900	7,600	19,700
50-84%	2,100	6,700	19,700	>19,700
85-100%	9,300	19,700	>19,700	**

PEDESTRIAN MODE <sup>2</sup>				
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)				
Sidewalk Coverage	B	C	D	E
0-49%	*	*	2,800	9,500
50-84%	*	1,600	8,700	15,800
85-100%	3,800	10,700	17,400	>19,700

BUS MODE (Scheduled Fixed Route) <sup>3</sup>				
(Buses in peak hour in peak direction)				
Sidewalk Coverage	B	C	D	E
0-84%	>5	≥4	≥3	≥2
85-100%	>4	≥3	≥2	≥1

2012 FDOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES



# GSVT Example 2.B

## Determine the auto LOS:

- In terms of peak hour directional volumes
- In a rural undeveloped area
- For an uninterrupted flow highway with:
  - 2 lanes (one in each direction)
  - 20% passing lane
  - No median/divided
  - Peak hour directional volume is 450

**Passing Lane Adjustments**  
 Alter LOS B-D volumes in proportion to the passing lane length to the highway segment length

Generalized Peak Hour Directional Volumes for Florida's Rural Undeveloped Areas and Developed Areas Less Than 5,000 Population<sup>1</sup> 12/18/12

**TABLE 9**

INTERRUPTED FLOW FACILITIES					UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS					FREEWAYS					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E
1	Undivided	*	670	740	**	2	1,680	2,500	3,040	3,500
2	Divided	*	1,250	1,980	**	3	2,500	3,700	4,260	5,400
3	Divided	*	2,360	2,400	**	4	3,360	4,980	6,080	7,200

Non-State Signalized Roadway Adjustments (After corresponding row volumes by the indicated percent)					Freeway Adjustments: Auxiliary Lanes: Present in Both Directions: -1,000					
Non-State Signalized Roadways - 10%										
<b>Median &amp; Turn Lane Adjustments</b>					<b>UNINTERRUPTED FLOW HIGHWAYS</b>					
					Rural Undeveloped					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors	Lanes	Median	B	C	D	E
1	Divided	Yes	No	-5%	1	Undivided	240	430	740	1,490
1	Undivided	No	No	-20%	2	Divided	1,340	2,100	2,660	3,020
Mult	Undivided	Yes	No	-5%	3	Divided	2,020	3,150	4,000	4,530
Mult	Undivided	No	No	-25%	Developed Areas					
-	-	-	Yes	-5%	Lanes <th>Median</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th>	Median	B	C	D	E
					1	Undivided	450	850	1,200	1,640
					2	Divided	1,250	2,120	2,720	3,110
					3	Divided	2,020	3,180	4,090	4,670

BICYCLE MODE <sup>2</sup> (Multiply unadjusted vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)					
Rural Undeveloped					
Paved Shoulder/Bicycle Lane Coverage	B	C	D	E	
0-49%	*	70	110	170	
50-84%	*	60	120	180	380
85-100%	*	140	210	1,000	>1,000

Developed Areas					
Paved Shoulder/Bicycle Lane Coverage	B	C	D	E	
0-49%	*	120	260	840	
50-84%	*	100	240	720	1,000
85-100%	*	220	1,000	>1,000	

PEDESTRIAN MODE <sup>3</sup> (Multiply unadjusted vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)					
Rural Undeveloped					
Sidewalk Coverage	B	C	D	E	
0-49%	*	*	120	460	
50-84%	*	80	410	770	
85-100%	*	180	520	860	>1,000

2012 FOOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES

## UNINTERRUPTED FLOW HIGHWAYS

Rural Undeveloped					
Lanes	Median	B	C	D	E
1	Undivided	240	430	740	1,490
2	Divided	1,340	2,100	2,660	3,020
3	Divided	2,020	3,150	4,000	4,530

# GSVT Example 3

## Determine the auto LOS:

- In terms of peak hour directional volumes
- In an urban/transitioning area
- For a non-state signalized roadway with:
  - 45 mph speed limit
  - 6 lanes (3 in each direction)
  - Peak hour directional volume of 2,500

STATE SIGNALIZED ARTERIALS					
Class I (40 mph or higher posted speed limit)					
Lanes	Median	B	C	D	E
1	Undivided	*	710	800	**
2	Divided	*	1,740	1,820	**
3	Divided	*	2,670	2,740	**

Non-State Signalized Roadway Adjustments	
(Alter corresponding state volumes by the indicated percent.)	
Non-State Signalized Roadways	- 10%

Generalized Peak Hour Directional Volumes for Florida's Transitioning and Areas Over 5,000 Not in Urbanized Areas<sup>1</sup>

TABLE 8

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS						FREEWAYS					
Class I (40 mph or higher posted speed limit)						Class II (35 mph or lower posted speed limit)					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
1	Undivided	*	710	800	**	2	2,200	2,880	3,440	3,580	
2	Divided	*	1,740	1,820	**	3	3,260	4,280	5,100	5,540	
3	Divided	*	2,670	2,740	**	4	4,360	5,680	6,760	7,500	
						5	5,300	7,080	8,440	9,440	
Class II (35 mph or lower posted speed limit) Lanes Median B C D E 1 Undivided * 350 680 710 2 Divided * 500 1,460 1,600 3 Divided * 810 2,280 2,420						Freeway Adjustments Auxiliary Lane Ramp Lane Merging -1,000 -5%					
Non-State Signalized Roadway Adjustments (Alter corresponding state volumes by the indicated percent.) Non-State Signalized Roadways: -10%						UNINTERRUPTED FLOW HIGHWAYS Lanes Median B C D E 1 Undivided 450 850 1,200 1,640 2 Divided 1,740 2,450 3,110 3,440 3 Divided 2,610 3,680 4,660 5,170					
Median & Turn Lane Adjustments (Alter corresponding state volumes by the indicated percent.) Median & Turn Lane Adjustments Lanes Median Left Lanes Right Lanes Adjustment Factors 1 Divided Yes No +5% 2 Undivided No No -20% Multi Undivided Yes No -5% Multi Undivided No No -20% - - - Yes +5%						Uninterrupted Flow Highway Adjustments Lanes Median Exclusive Left Lanes Adjustment Factors 1 Divided Yes -5% Multi Undivided Yes -5% Multi Undivided No -25%					
One-Way Facility Adjustment Multiply the corresponding directional volumes in this table by: 2						BICYCLE MODE <sup>2</sup> (Multiply state vehicle volumes below by number of directional roadway lanes to determine two-way maximum service volumes.) Paved Shoulder Bicycle Lane Coverage B C D E 0-49% * 140 320 1,000 50-84% * 100 260 840 -1,000 85-100% 380 1,000 >1,000 **					
PEDESTRIAN MODE <sup>3</sup> (Multiply state vehicle volumes below by number of directional roadway lanes to determine two-way maximum service volumes.) Sidewalk Coverage B C D E 0-49% * 140 480 50-84% * 80 440 800 85-100% 200 540 880 >1,000						BUS MODE (Scheduled Fixed Route) <sup>4</sup> (State peak hour peak direction) Sidewalk Coverage B C D E 0-84% > 5 > 4 > 3 > 2 85-100% > 4 > 3 > 2 > 1					

Notes: Values are presented as peak hour directional volumes for levels of service and are for the urban/transitioning areas specifically noted. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific urbanized areas. The table and associated computer models should not be used for rural or unincorporated areas, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Traffic Capacity and Quality of Service Manual.

<sup>1</sup> Levels of service for the bicycle and pedestrian modes in this table is based on number of maximum volume lanes, not number of bicycle or pedestrian lanes in the facility.

<sup>2</sup> Does not include volume for the peak lane in the single direction of the higher traffic flow.

<sup>3</sup> Cannot be achieved using table to report volume deficits.

<sup>4</sup> Not applicable for that level of service letter grade. For the maximum mode, volume greater than level of service D because of lower intersection saturation lanes have included. For the bicycle mode, the level of service may grade (including F), and according to the notes there is an associated vehicle volume threshold to report volume deficits.

Source: Florida Department of Transportation, Systems Planning Office, [www.dot.state.fl.us/transportation/tables/tables.html](http://www.dot.state.fl.us/transportation/tables/tables.html)

2012 FDOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES

# GSVT Example 4.A

## Determine the bicycle LOS:

- In terms of AADT
- In an urbanized area
- For a state signalized arterial with:
  - 2 lanes
  - AADT=13,000
  - 3 buses/hour
  - 90% bike lane coverage
  - 40% sidewalk coverage

<b>BICYCLE MODE<sup>2</sup></b>				
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)				
Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	2,900	7,600	19,700
50-84%	2,100	6,700	19,700	>19,700
85-100%	9,300	19,700	>19,700	**

**TABLE 1** Generalized Annual Average Daily Volumes for Florida's Urbanized Areas 12/16/12

INTERRUPTED FLOW FACILITIES					UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS					FREEWAYS					
Class I (40 mph or higher posted speed limit)					Core Urbanized					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E
2	Undivided	*	16,800	17,700	**	4	47,400	64,000	77,900	84,600
4	Divided	**	37,900	39,800	**	6	69,900	95,200	116,600	130,600
6	Divided	**	58,400	59,900	**	8	92,500	126,400	154,300	176,600
8	Divided	**	78,800	80,100	**	10	115,100	159,700	194,500	222,700
						12	162,400	218,700	256,600	288,900
Class II (35 mph or slower posted speed limit)					Urbanized					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E
2	Undivided	*	7,300	14,800	15,600	4	45,800	61,500	74,400	79,900
4	Divided	**	14,500	32,400	33,800	6	68,100	93,000	111,800	123,300
6	Divided	**	23,300	50,000	50,900	8	91,500	123,500	148,700	166,800
8	Divided	**	32,000	67,300	68,100	10	114,800	156,600	187,100	210,300

Non-State Signalized Roadway Adjustments		Freeway Adjustments	
(After corresponding raw volumes by the indicated percent)		Auxiliary Lane	Empty Metering
Non-State Signalized Roadways	-10%	Present in Both Directions	+5%
		~20,000	-5%

UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	B	C	D	E
2	Undivided	8,600	17,000	24,200	33,300
4	Divided	36,700	51,800	65,600	72,600
6	Divided	55,000	77,700	98,300	108,800

UNinterrupted Flow Highway Adjustments			
Lanes	Median	Exclusive left lane	Adjustment factor:
2	Divided	Yes	+5%
Multi	Undivided	No	-5%
Multi	Undivided	No	-25%

BICYCLE MODE <sup>2</sup>				
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)				
Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	2,900	7,600	19,700
50-84%	2,100	6,700	19,700	19,700
85-100%	9,300	19,700	19,700	**

PEDESTRIAN MODE <sup>3</sup>				
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)				
Sidewalk Coverage	B	C	D	E
0-49%	*	1,600	2,800	9,700
50-84%	1,600	1,600	8,700	15,800
85-100%	3,800	10,700	17,400	19,700

BUS MODE (Scheduled Fixed Route) <sup>3</sup>				
(Buses in peak hour in peak direction)				
Sidewalk Coverage	B	C	D	E
0-49%	> 4	-	-	-
50-84%	> 4	-	-	-
85-100%	> 4	-	-	-

Source: Florida Department of Transportation, Division Planning Office, [www.dot.state.fl.us/planning/transportation/traffic/default.htm](http://www.dot.state.fl.us/planning/transportation/traffic/default.htm)

2012 FOOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES

# GSVT Example 4.B

## Determine the pedestrian LOS:

- In terms of AADT
- In an urbanized area
- For a state signalized arterial with:
  - 2 lanes
  - AADT=13,000
  - 3 buses/hour
  - 90% bike lane coverage
  - 40% sidewalk coverage

### PEDESTRIAN MODE<sup>2</sup>

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

Sidewalk Coverage	B	C	D	E
0-49%	*	*	2,800	9,500
50-84%	*	1,600	8,700	15,800
85-100%	3,800	10,700	17,400	>19,700

Generalized Annual Average Daily Volumes for Florida's Urbanized Areas

12/18/12

TABLE 1					
UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS					
Class I (40 mph or higher posted speed limit)					
Lanes	Median	B	C	D	E
2	Undivided	* 16,800	17,700	**	
4	Divided	** 37,900	39,800	**	
6	Divided	** 58,400	59,900	**	
8	Divided	** 78,800	80,100	**	
Class II (35 mph or slower posted speed limit)					
Lanes	Median	B	C	D	E
2	Undivided	* 7,300	14,800	15,600	
4	Divided	** 14,500	32,400	33,800	
6	Divided	** 23,300	50,000	50,900	
8	Divided	** 32,000	67,300	68,100	
Non-State Signalized Roadway Adjustments					
(Use corresponding row volume by the indicated percent.)					
Non-State Signalized Roadways -10%					
Median & Turn Lane Adjustments					
Lanes	Median	Left Lanes	Right Lanes	Adjustment Factor	
2	Divided	Yes	No	+5%	
2	Undivided	No	No	-20%	
Multi	Undivided	Yes	No	-5%	
Multi	Undivided	No	No	-25%	
-	-	-	Yes	+5%	
One-Way Facility Adjustment					
Multiply the corresponding row-directional volumes in this table by 0.6					
BIKEWAY MODE <sup>2</sup>					
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)					
Paved Shoulder/Bicycle Lane Coverage					
	B	C	D	E	
0-49%	* 2,900	7,600	19,700		
50-84%	2,100	6,700	19,700	19,700	
85-100%	9,300	19,700	-19,700	**	
PEDESTRIAN MODE <sup>2</sup>					
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)					
Sidewalk Coverage					
	B	C	D	E	
0-49%	* 2,800	9,500			
50-84%	* 1,600	8,700	15,800		
85-100%	3,800	10,700	17,400	-19,700	
BUS MODE (Scheduled Fixed Route) <sup>3</sup>					
(Buses in peak hour in peak direction)					
Sidewalk Coverage	B	C	D	E	
0-49%	> 4	-1	-3	-1	
50-84%	> 4	-3	-2	-1	
85-100%	> 4	-3	-2	-1	
UNINTERRUPTED FLOW FACILITIES					
FREEWAYS					
Core Urbanized					
Lanes	B	C	D	E	
4	47,400	64,000	77,900	84,600	
6	69,900	95,200	116,600	130,600	
8	92,500	126,400	154,300	176,600	
10	115,100	159,700	194,500	222,700	
12	162,400	218,700	256,600	288,900	
Urbanized					
Lanes	B	C	D	E	
4	45,800	61,500	74,400	79,900	
6	68,100	93,000	111,800	123,300	
8	91,500	123,500	148,700	166,800	
10	114,800	156,000	187,100	210,300	
Freeway Adjustments					
Auxiliary Lane Present in Both Directions -20.00%					
Ramp Metering -5%					
UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	B	C	D	E
2	Undivided	8,600	17,000	24,200	33,300
4	Divided	36,700	51,800	65,600	72,600
6	Divided	55,000	77,700	98,300	108,800
Uninterrupted Flow Highway Adjustments					
Lanes	Median	Exclusive left lane	Adjustment Factor		
2	Divided	Yes	+5%		
Multi	Undivided	Yes	-5%		
Multi	Undivided	No	-25%		

\* Values shown are presented as two-way annual average daily volumes for levels of service and are for the maximum truck, median, values specifically noted. This table does not consider a modified and should be used only for general planning applications. The computer models from which this table is derived should be used for more exact planning applications. The table and data that computer models should be used for computer simulation models, where more refined inclusion rules, calculations and level of planning applications of the highway design process and the traffic growth and quality of service issues.

<sup>1</sup> Level of service for the bicycle and pedestrian modes in this table is based on number of uninterrupted vehicle, not number of vehicle or pedestrian, in the direction.

<sup>2</sup> Buses per hour shown are only for the peak hour in the single direction of the highest traffic flow.

<sup>3</sup> Cautions to scheduled route table input value defaults.

\*\* Not applicable for the level of service lower grade. For the maximum use, values greater than level of service D (except for Pedestrian mode) are not shown. Values are shown for the level of service lower grade (the default P) is not indicated in cases where there is an associated vehicle volume indicated using table input value defaults.

Source: Florida Department of Transportation, Division Planning Office, [www.dot.state.fl.us/planning/transportation/tables/default.asp](http://www.dot.state.fl.us/planning/transportation/tables/default.asp)

2012 FDOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES

# GSVT Example 4.C

## Determine the bus LOS:

- In terms of AADT
- In an urbanized area
- For a state signalized arterial with:
  - 2 lanes
  - AADT=13,000
  - 3 buses/hour
  - 90% bike lane coverage
  - 40% sidewalk coverage

Generalized Annual Average Daily Volumes for Florida's Urbanized Areas

**TABLE 1** 12/18/12

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
<b>STATE SIGNALIZED ARTERIALS</b>						<b>FREEWAYS</b>					
<b>Class I (40 mph or higher posted speed limit)</b>						<b>Core Urbanized</b>					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
2	Undivided	16,800	17,700	**	**	4	47,400	64,000	77,900	84,600	
4	Divided	37,800	39,800	**	**	6	69,900	95,200	116,600	130,600	
6	Divided	58,400	59,900	**	**	8	85,500	126,400	154,300	176,600	
8	Divided	78,800	80,100	**	**	10	115,100	159,700	194,500	222,700	
						12	162,400	216,700	256,600	288,900	
<b>Class II (35 mph or slower posted speed limit)</b>						<b>Urbanized</b>					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
2	Undivided	7,200	14,800	15,600		4	45,800	61,500	74,400	79,900	
4	Divided	14,500	32,400	33,800		6	68,100	93,000	111,800	123,300	
6	Divided	23,300	50,000	50,900		8	91,500	123,500	148,700	166,800	
8	Divided	33,000	67,500	68,100		10	114,800	156,000	187,100	210,300	
<b>Non-State Signalized Roadway Adjustment</b> (After corresponding row volumes by the indicated percent.)						<b>Freeway Adjustments</b>					
Non-State Signalized Roadways: -10%						Freeway Adjustments					
						Auxiliary Lane: +20.00%					
						Present in Both Directions: +5%					
						Ramp Metering: +5%					
<b>Median &amp; Turn Lane Adjustments</b>						<b>UNINTERRUPTED FLOW HIGHWAYS</b>					
Lanes	Median	Left Lanes	Exclusive Right Lanes	Adjustment Factors		Lanes	Median	B	C	D	E
2	Divided	Yes	No	-5%		2	Undivided	8,600	17,000	24,200	33,300
4	Divided	No	No	-20%		4	Divided	16,700	51,800	65,600	72,600
6	Divided	Yes	No	-5%		6	Divided	25,000	77,700	98,300	108,800
8	Divided	No	No	-20%							
Multi	Undivided	-	Yes	-5%		<b>Uninterrupted Flow Highway Adjustment</b>					
						Lanes	Median	Exclusive left lanes	Adjustment factors		
						2	Divided	Yes	-5%		
						Multi	Undivided	Yes	-5%		
						Multi	Undivided	No	-25%		
<b>One-Way Facility Adjustment</b> Multiply the corresponding two-directional volumes in this table by 0.6											
<b>BICYCLE MODE<sup>1</sup></b>											
Multiply sanctioned vehicle volumes below by number of directional roadway lanes to determine two-way maximum service volumes.											
Paved Shoulder/Bicycle Lane Coverage											
	B	C	D	E							
0-49%	2,900	7,600	19,700								
50-84%	2,100	6,700	19,700	-19,700							
85-100%	9,200	19,700	19,700	**							
<b>PEDESTRIAN MODE<sup>1</sup></b>											
Multiply sanctioned vehicle volumes below by number of directional roadway lanes to determine two-way maximum service volumes.											
Sidewalk Coverage											
	B	C	D	E							
0-49%	+	+	2,800	9,500							
50-84%	+	1,600	8,700	15,800							
85-100%	3,800	10,700	17,400	-19,700							
<b>BUS MODE (Scheduled Fixed Route)<sup>3</sup></b>											
(Buses in peak hour in peak direction)											
Sidewalk Coverage											
	B	C	D	E							
0-84%	> 5	≥ 4	≥ 3	≥ 2							
85-100%	> 4	≥ 3	≥ 2	≥ 1							

Source: Florida Department of Transportation, Florida Planning Office, [www.dot.state.fl.us/planning/systems/in/bd/vol.htm](http://www.dot.state.fl.us/planning/systems/in/bd/vol.htm)

2012 FDOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES

## BUS MODE (Scheduled Fixed Route)<sup>3</sup> (Buses in peak hour in peak direction)

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

# GSVT Example 5

## Determine the auto LOS:

- In terms of AADT
- In an urban/transitioning area (pop. 12,000)
- For an undivided state arterial with:
  - 30 mph speed limit
  - 2 lanes
  - 6,000 AADT
  - No left turn lanes

Median & Turn Lane Adjustments				
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
-	-	-	Yes	+5%

Generalized Annual Average Daily Volumes for Florida's Transitioning Areas and Areas Over 5,000 Not in Urbanized Areas<sup>1</sup>

TABLE 2

INTERRUPTED FLOW FACILITIES					UNINTERRUPTED FLOW FACILITIES					
<b>STATE SIGNALIZED ARTERIALS</b>					<b>FREEWAYS</b>					
Class I (40 mph or higher posted speed limit)					Lanes					
Lanes	Median	B	C	D	E	B	C	D	E	
2	Undivided	*	14,400	16,300	**	4	44,100	57,600	68,900	71,700
4	Divided	*	34,000	35,500	**	6	65,100	85,600	102,200	111,000
6	Divided	*	52,100	53,500	**	8	85,100	113,700	135,200	150,000
						10	106,200	141,700	168,800	189,000
Class II (35 mph or slower posted speed limit)					Freeway Adjustments					
Lanes	Median	B	C	D	E	Auxiliary Lanes		Ramp		
2	Undivided	*	6,500	13,300	14,200	Present in Both Directions		Measuring		
4	Divided	*	9,900	28,800	31,600	+ 20,000		- 5%		
6	Divided	*	16,000	44,900	47,600					
Non-State Signalized Roadway Adjustments					UNINTERRUPTED FLOW HIGHWAYS					
(Other corresponding vpm volumes by the indicated percent)					Lanes					
Non-State Signalized Roadways - 10%					Median					
					B					
					C					
					D					
					E					
					Adjustment Factors					
Lanes	Median	Left Lanes	Right Lanes	Factors						
2	Divided	Yes	No	+5%						
2	Undivided	No	No	-20%						
Multi	Undivided	Yes	No	-5%						
Multi	Undivided	No	No	-25%						
-	-	-	Yes	+5%						
One-Way Facility Adjustment					Uninterrupted Flow Highway Adjustments					
Multiply the corresponding two-directional volumes in this table by 0.6					Lanes					
					Median					
					B					
					C					
					D					
					E					
					Adjustment Factors					
					2					
					Divided					
					Yes					
					-5%					
					Multi					
					Undivided					
					Yes					
					-25%					
					No					
					-25%					

**BICYCLE MODE<sup>2</sup>**  
Multiply automated vehicle volumes shown below by number of directional roadway lanes to determine two-way unidirectional service volumes.

Shoulder/Bicycle Lane Coverage	Paved			
	B	C	D	E
0-49%	*	2,600	6,100	19,500
50-84%	*	1,900	5,500	18,400
85-100%	*	7,500	19,500	>19,500

**PEDESTRIAN MODE<sup>3</sup>**  
Multiply automated vehicle volumes shown below by number of directional roadway lanes to determine two-way unidirectional service volumes.

Sidewalk Coverage	Paved			
	B	C	D	E
0-49%	*	+	2,800	9,400
50-84%	*	+	1,600	8,600
85-100%	*	+	3,800	10,500

**BUS MODE (Scheduled Fixed Route)<sup>4</sup>**  
(Does not peak hour to peak direction)

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

Source: Florida Department of Transportation, Division Planning Office, www.fdot.com/QualityService/QualityServiceTables.cfm

Class II (35 mph or slower posted speed limit)					
Lanes	Median	B	C	D	E
2	Undivided	*	6,500	13,300	14,200
4	Divided	*	9,900	28,800	31,600
6	Divided	*	16,000	44,900	47,600

# GSVT Example 6

## Determine the auto LOS:

- In terms of AADT
- In an urban/transitioning area
- For a state signalized arterial with:
  - 4 lanes
  - No median
  - 35 mph speed limit
  - Exclusive left turn lanes
  - AADT of 28,000

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

Generalized Annual Average Daily Volumes for Florida's Transitioning Areas and Areas Over 5,000 Not in Urbanized Areas<sup>1</sup> 12/18/22

TABLE 2

INTERRUPTED FLOW FACILITIES					UNINTERRUPTED FLOW FACILITIES					
<b>STATE SIGNALIZED ARTERIALS</b>					<b>FREEWAYS</b>					
Class I (60 mph or higher posted speed limit)					Lanes B C D E					
Lanes	Median	B	C	D	E	4	44,100	57,600	69,900	71,700
2	Undivided	*	14,400	16,200	**	6	65,100	85,600	102,200	111,000
4	Divided	*	34,000	35,500	**	8	85,100	113,700	133,200	150,000
6	Divided	*	52,100	55,500	**	10	106,200	141,700	168,800	189,000
Class II (35 mph or slower posted speed limit)					Freeway Adjustments					
Lanes	Median	B	C	D	E	Auxiliary Lanes Ramp				
2	Undivided	*	6,500	13,300	14,200	Present in Both Directions -20.00%				
4	Divided	*	9,900	28,800	31,600					
6	Divided	*	16,000	44,900	47,600					
Non-State Signalized Roadway Adjustments					UNINTERRUPTED FLOW HIGHWAYS					
(After corresponding sum volumes by the indicated percent)					Lanes Median B C D E					
Non-State Signalized Roadways -10%					2 Undivided 9,200 17,500 24,400 33,500					
					4 Divided 35,300 49,600 63,900 69,600					
					6 Divided 52,800 74,500 94,300 104,500					
Median & Turn Lane Adjustments					Uninterrupted Flow Highway Adjustments					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors	Lanes	Median	Exclusive Left Lanes	Adjustment Factors		
2	Divided	Yes	No	+5%	2	Divided	Yes	-5%		
2	Undivided	No	No	-20%	Multi	Undivided	Yes	-5%		
Multi	Undivided	Yes	No	-5%	Multi	Undivided	No	-25%		
Multi	Undivided	No	Yes	+5%						
One-Way Facility Adjustment					BICYCLE MODE <sup>2</sup>					
Multiply the corresponding two-directional volumes in this table by 0.8					Obtainly measured vehicle volume (shown below by number of directional roadway lanes to determine two-way maximum service volumes.)					
					Shoulder/Bicycle Lane Coverage B C D E					
					0-49% * 2,600 6,100 19,500					
					50-84% 1,900 5,500 18,400 >19,500					
					85-100% 7,500 19,500 >19,500 **					
					PEDESTRIAN MODE <sup>3</sup>					
					Obtainly measured vehicle volume (shown below by number of directional roadway lanes to determine two-way maximum service volumes.)					
					Sidewalk Coverage B C D E					
					0-49% * 1,600 8,600 15,600					
					50-84% 3,800 10,500 17,100 >19,500					
					85-100% 3,800 10,500 17,100 >19,500					
					BUS MODE (Scheduled Fixed Route) <sup>4</sup>					
					(Shown in peak hour in peak direction)					
					Sidewalk Coverage B C D E					
					0-84% -5 -4 -3 -2					
					85-100% -4 -3 -2 -1					

<sup>1</sup> Values shown are presented as two-way annual average daily volume for both directions and are for the urbanized areas specifically noted. The table also contains a shaded and should be used only for general planning purposes. The corresponding median flow which table is derived should be used for more specific planning applications. The table and design volume models should be used for roadway performance design. When specific roadway characteristics are noted, they are the primary application of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

<sup>2</sup> Level of service for the bicycle and pedestrian modes in this table is based on number of interrupted vehicles, not number of bicycles or pedestrians, using the facility.

<sup>3</sup> These per-lane values are only for the peak hour in the single direction of the higher traffic flow.

<sup>4</sup> Cannot be achieved using table sign vehicle data.

<sup>5</sup> Not applicable to the dual level of service table grade. For the non-signalized mode, volume average daily level of service is D because of excess intersection capacity, lane length reached. For the signalized mode, the level of service being grade is below F, so it is not applicable to increase there in an un-saturated vehicle volume flow table sign vehicle data.

Source: Florida Department of Transportation, Transit Planning Office, <http://www.floridadot.com/traffic/tables>

2012 FOOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES

Lanes	Median	B	C	D	E
2	Undivided	*	6,500	13,300	14,200
4	Divided	*	9,900	28,800	31,600
6	Divided	*	16,000	44,900	47,600



# HIGHPLAN

## Example 1 *Two-Lane Segment*

SR 24 between US 19/US 98 & SR 500, near Gainesville

- Rural undeveloped area type
- EB peak direction
- 45 mph posted speed limit
- 11.3 mile segment
- 4% no passing zones
- No median

AADT	D-Factor	% Heavy Vehicles	Local Adjustment Factor
1,200	55.3	5.0	0.84

# HIGHPLAN

## Workshop 1 *Two-Lane Segment*

SR 62 between Saffold Rd & SR 37, Parrish/Wauchula

- Rural undeveloped area type
- EB peak direction
- 60 mph posted speed limit
- 10.9 mile segment
- 11% no passing zones
- No median

AADT	D-Factor	% Heavy Vehicles	Local Adjustment Factor
3,500	55.8	5.0	0.84

# HIGHPLAN

## Workshop 2 *Multilane Segment*

US 19/27 between Avalon Rd & CR 14, Lamont

- Rural undeveloped area type
- NB peak direction
- 4-lane highway
- 65 mph posted speed limit
- 12.6 mile segment
- Median present

AADT	D-Factor	% Heavy Vehicles	Local Adjustment Factor
5,056	55.8	12.0	0.76

# ARTPLAN

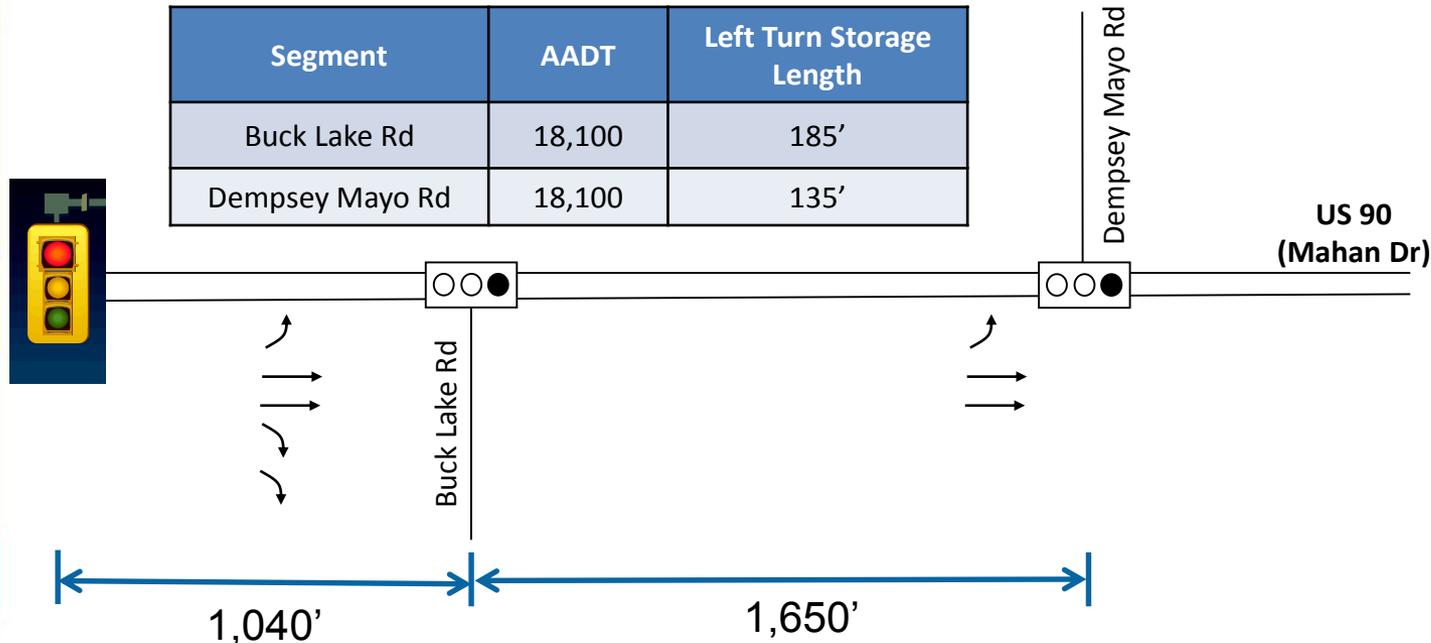
## Example 1 *Planning-Level Inputs, Auto Only*

Mahan Drive and Dempsey Mayo Road, Tallahassee

- Fully actuated signal, protected only phasing
- Percent turns (L = 5%)
- Restrictive median
- 45 mph

D-Factor	% Hvy Vhcls
71.3	1.0

Segment	AADT	Left Turn Storage Length
Buck Lake Rd	18,100	185'
Dempsey Mayo Rd	18,100	135'



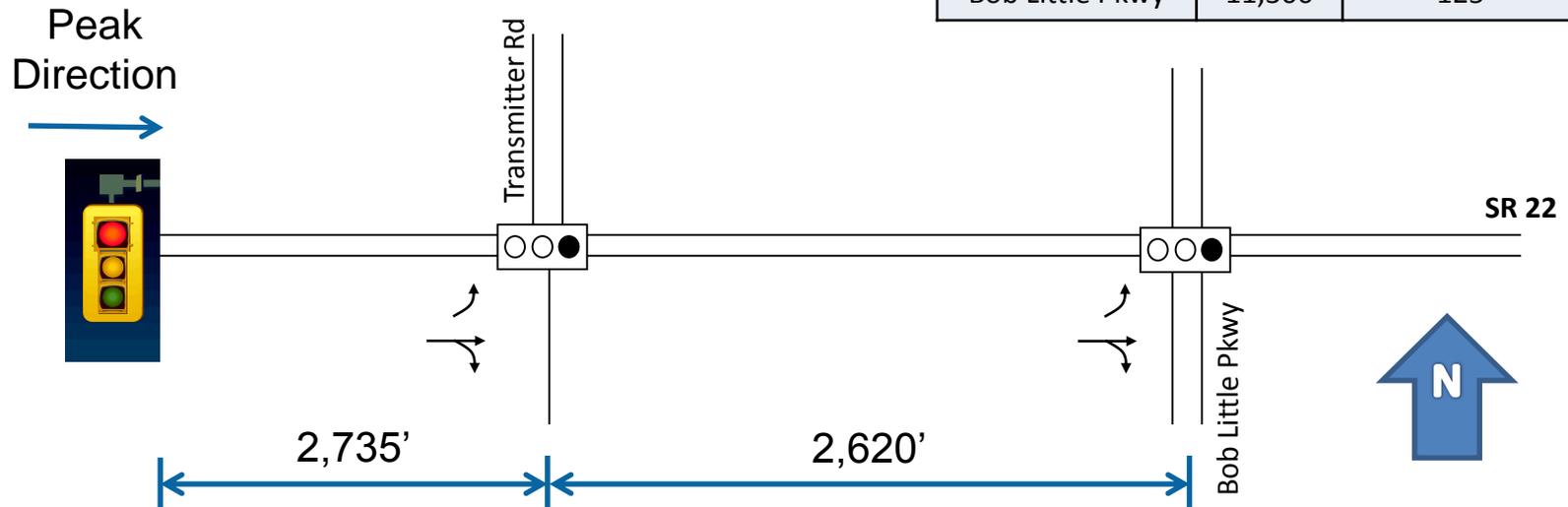
# ARTPLAN

## Workshop 1 *Planning-Level Inputs, Auto Only*

### SR 22 between Transmitter Rd & Bob Little Rd

- Fully actuated signal, protected lefts only
- Posted speed = 45 mph
- No median

Segment	AADT	Left Turn Storage Length
Transmitter Rd	10,500	325'
Bob Little Pkwy	11,300	125'



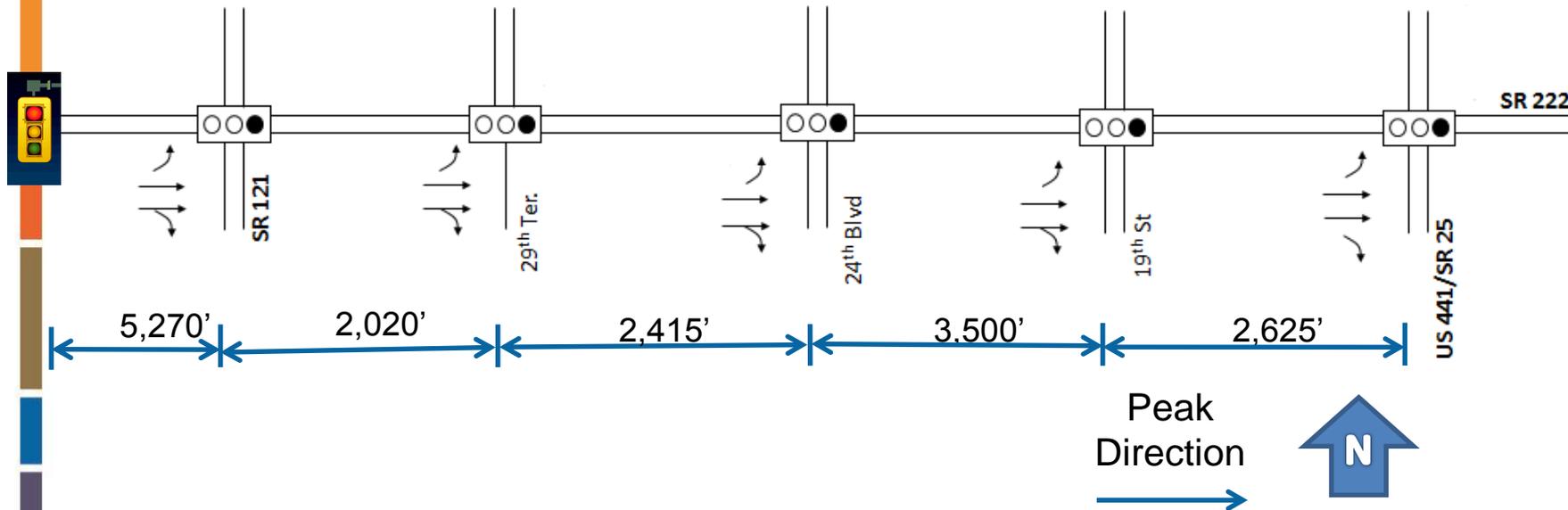
# ARTPLAN

## Workshop 2 Planning-Level Inputs, Auto Only

### SR 222 between SR 121 & US 441/SR 441

- Coordinated/actuated
- Posted speed = 45 mph
- Bounded by major intersections on each end
- Non-restrictive median

Segment	% Left Turns	% Right Turns	Left Turn Storage	AADT
SR 121	12	12	510'	27,000
29 <sup>th</sup> Terr.	5	5	150'	27,000
24 <sup>th</sup> Blvd.	5	5	175'	25,000
19 <sup>th</sup> St.	5	5	150'	25,000
US 441	10	12	135'	25,500



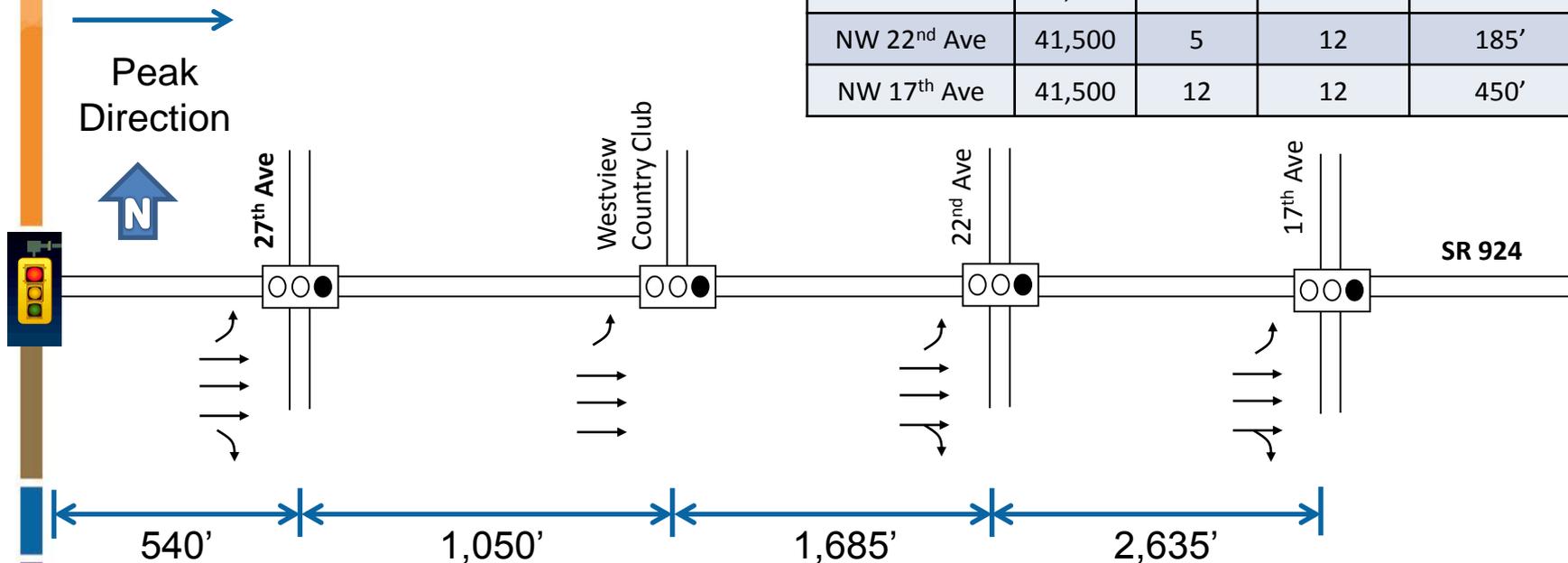
# ARTPLAN

## Workshop 3 *Known Inputs & Multimodal Analysis*

State Route 924 between 27<sup>th</sup> Ave & 17<sup>th</sup> Ave, Miami

- Non-restrictive median west of 27<sup>th</sup> Ave
- 40 mph posted speed limit

Segment	AADT	% Left Turns	% Right Turns	Left Turn Storage
NW 27 <sup>th</sup> Ave	41,500	8	12	195'
Westview CC	41,500	5	0	155'
NW 22 <sup>nd</sup> Ave	41,500	5	12	185'
NW 17 <sup>th</sup> Ave	41,500	12	12	450'

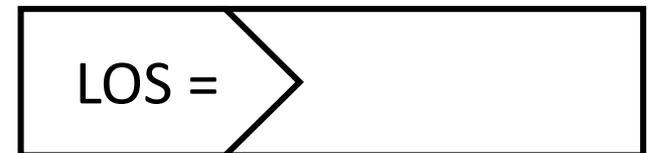


# ARTPLAN

## **Bicycle LOS Example 1** *Known Inputs & Multimodal Analysis*

- Area type: Large Urbanized
- ARTPLAN defaults
- Facility:
  - 4-lane divided Class 2 arterial
- AADT of 30,000
- K Factor: .09
- D Factor: .55
- Number of Signals: 3
- Through g/C: .44
- Bike Lanes: None

What is the bicycle LOS?

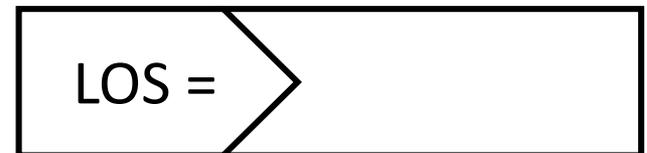


# ARTPLAN

## **Bicycle LOS Example 1** *Known Inputs & Multimodal Analysis*

- Area type: Large Urbanized
- ARTPLAN defaults
- Facility:
  - 4-lane divided Class 2 arterial
- AADT of 30,000
- K Factor: .09
- D Factor: .55
- Number of Signals: 3
- Through g/C: .44
- ~~Bike Lanes: None~~

What if a bike lane was added?

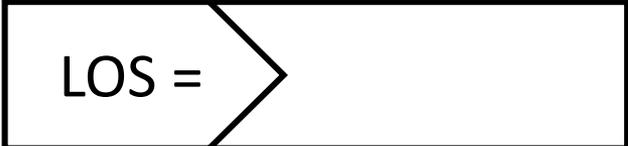


# ARTPLAN

## **Bicycle LOS Example 1** *Known Inputs & Multimodal Analysis*

- Area type: Large Urbanized
- ARTPLAN defaults
- Facility:
  - 4-lane divided Class 2 arterial
- AADT of 30,000
- K Factor: .09
- D Factor: .55
- Number of Signals: 3
- Through g/C: .44
- Bike Lanes: None

If the speed limit were lowered to 25mph from 30mph and no bike lanes?

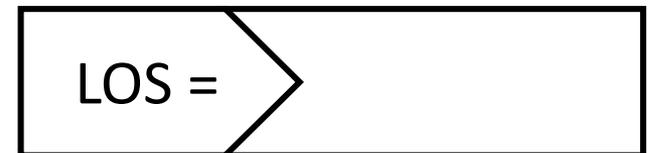
LOS = 

# ARTPLAN

## **Pedestrian LOS Example 1** *Known Inputs & Multimodal Analysis*

- Area type: Large Urbanized
- ARTPLAN defaults
- Facility:
  - 4-lane divided Class 2 arterial
- AADT of 34,000
- K Factor: .09
- D Factor: .565
- Number of Signals: 3
- Through g/C: .44
- Sidewalk: None

What is the pedestrian LOS?

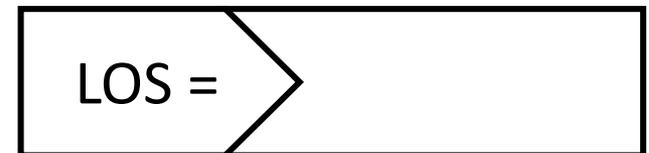


# ARTPLAN

## **Pedestrian LOS Example 1** *Known Inputs & Multimodal Analysis*

- Area type: Large Urbanized
- ARTPLAN defaults
- Facility:
  - 4-lane divided Class 2 arterial
- AADT of 34,000
- K Factor: .09
- D Factor: .565
- Number of Signals: 3
- Through g/C: .44
- ~~Sidewalk: None~~

What is the pedestrian LOS if a sidewalk with typical separation were added to the 2<sup>nd</sup> segment?

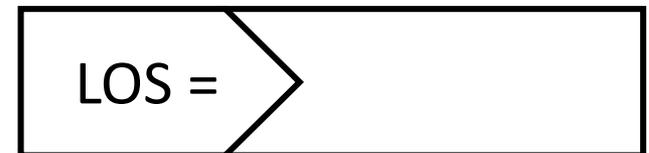


# ARTPLAN

## **Pedestrian LOS Example 1** *Known Inputs & Multimodal Analysis*

- Area type: Large Urbanized
- ARTPLAN defaults
- Facility:
  - 4-lane divided Class 2 arterial
- AADT of 34,000
- K Factor: .09
- D Factor: .565
- Number of Signals: 3
- Through g/C: .44
- ~~Sidewalk: None~~

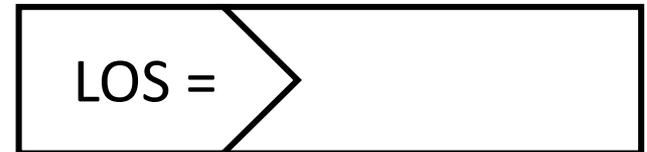
What is the pedestrian LOS if a sidewalk with typical separation were added to the whole facility?



# ARTPLAN

## **Bus LOS Example 1** *Known Inputs & Multimodal Analysis*

- Area type: Large Urbanized
- ARTPLAN defaults
- Facility:
  - 4-lane divided Class 1 arterial
- AADT of 34,000
- K Factor: .09
- D Factor: .565
- Number of Signals: 4
- Through g/C: .45
- Bus frequency: 3
- Bus Stop Amenities: Excellent
- Speed = 45mph



# ARTPLAN

## Workshop 4.A *Known Inputs & Multimodal Analysis*

With inputs from Bus LOS Example #1 and the following bus inputs:  
 What is the Bus Level of Service for each segment and the facility as a whole?

Freq. =	▶

From	To	Buses/Hr in peak direction	Existence of Sidewalk	Passenger Load	Stop Amenities
Easy	First	3	Yes	50%	Excellent
First	Second	2	Yes	60%	Excellent
Second	Third	2	No	60%	Excellent
Third	Mulberry	1	No	75%	Excellent

LOS =	▶
-------	---

# ARTPLAN

## Workshop 4.B *Known Inputs & Multimodal Analysis*

With inputs from Bus LOS Example #1 and the following bus inputs:  
 What is the Bus Level of Service for each segment and the facility as a whole?

Freq. =	▶

From	To	Buses/Hr in peak direction	Existence of Sidewalk	Passenger Load	Stop Amenities
Easy	First	2	Yes	110%	Excellent
First	Second	2	Yes	80%	Excellent
Second	Third	2	No	80%	Excellent
Third	Mulberry	2	No	110%	Excellent

LOS =	▶
-------	---

# ARTPLAN

## Workshop 4.C *Known Inputs & Multimodal Analysis*

With inputs from Bus LOS Example #1 and the following bus inputs:  
What is the Bus Level of Service for each segment and the facility as a whole?

	From	To	Buses/Hr in peak direction	Existence of Sidewalk	Passenger Load	Stop Amenities
Freq. =	Easy	First	3	Yes	50%	Excellent
Freq. =	First	Second	2	Yes	60%	Good
Freq. =	Second	Third	2	No	60%	Fair
Freq. =	Third	Mulberry	1	No	75%	Poor

LOS =

Use data file saved from Workshop 3 in ARTPLAN unit for this workshop

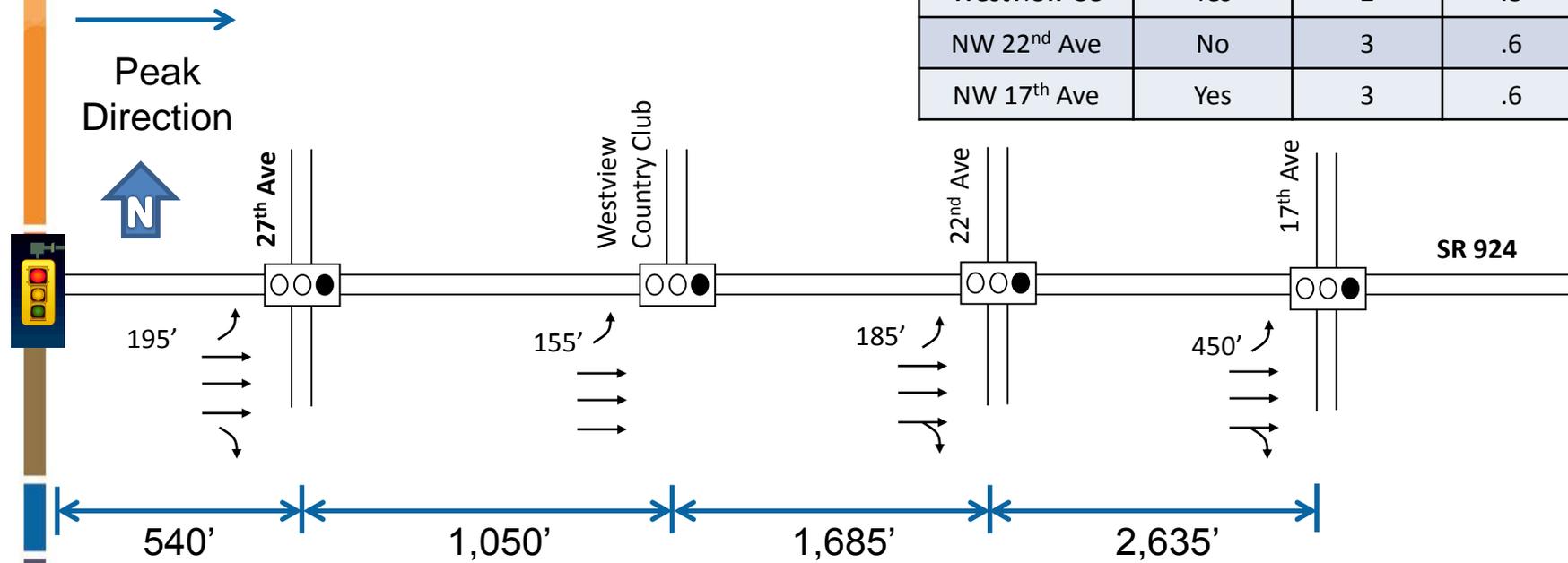
# ARTPLAN

## Workshop 5 *Known Inputs & Multimodal Analysis*

State Route 924 between 27<sup>th</sup> Ave & 17<sup>th</sup> Ave, Miami

- Fully actuated signal
- Bus frequency = 2 per hour
- Bus occupancy: 80%

Segment	Sidewalk	Buses per hour	Load Factor
NW 27 <sup>th</sup> Ave	Yes	2	.8
Westview CC	Yes	2	.8
NW 22 <sup>nd</sup> Ave	No	3	.6
NW 17 <sup>th</sup> Ave	Yes	3	.6





# FREEPLAN

## Example 1

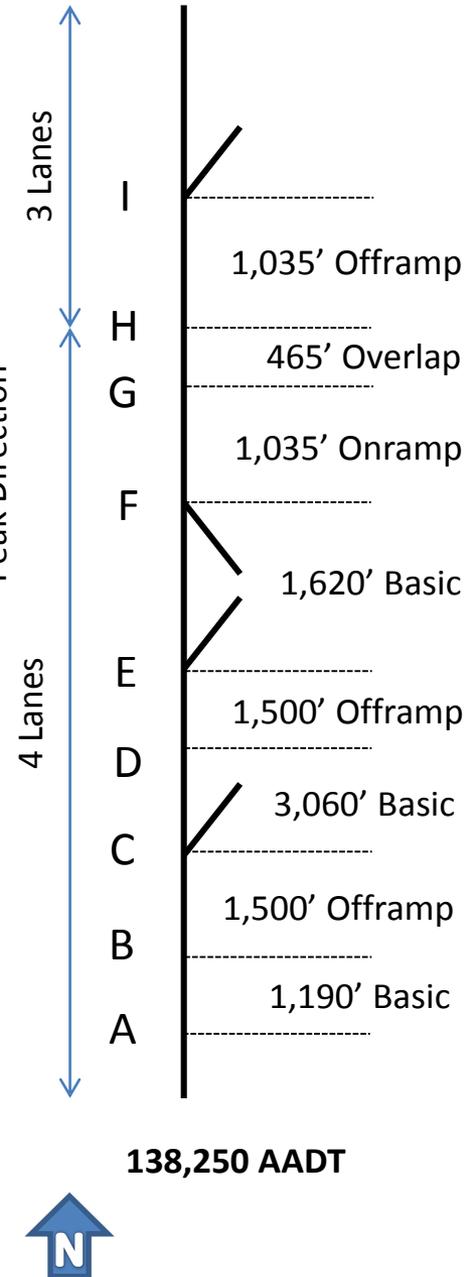
*Basic/Ramps/Ramp Overlap*

*I-4 between Princeton St & Lee Rd, Orlando*

- Large urbanized area type
- Core freeway – K-factor of 8.0 ( $K_{other}$ )
- 50 mph posted speed limit

D-Factor	% Heavy Vehicles	Local Adjustment Factor
51.8	4.0	0.98

Segment	Segment Name	Type	Ramp Demand	# of Ramp Lanes	Ramp % Heavy Vehicles	Acc/Dec Length [ft]	Ramp FFS
2	B-C	Off-Ramp	486	1	4.0	740	40
4	D-E	Off-Ramp	720	1	4.0	600	40
6	F-G	On-Ramp	486	1	4.0	600	40
8	H-I	Off-Ramp	945	1	4.0	1,500	40





# FREEPLAN

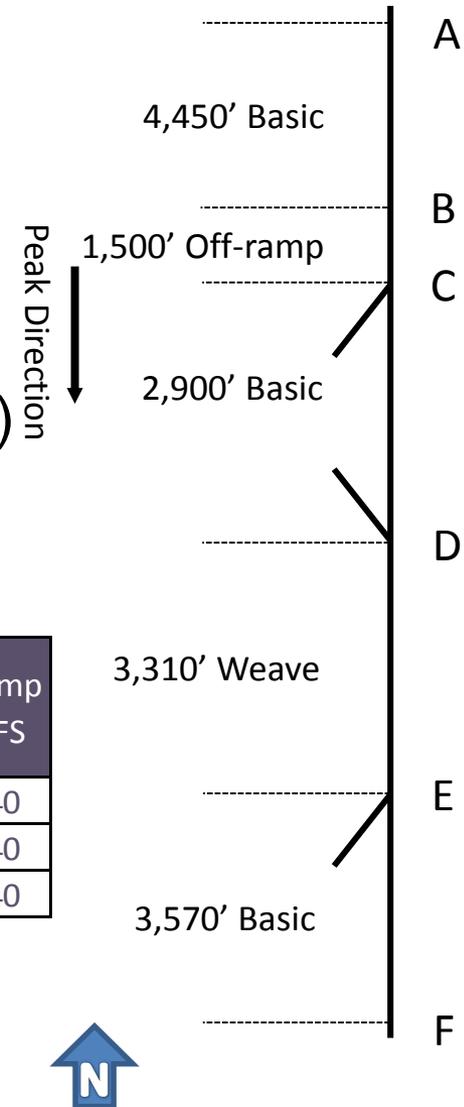
75,000 AADT

2 Lanes

## Workshop 1 Basic/Ramps/Weave

*I-295 between St. Johns Bluff Rd & Town Center Pkwy, Jacksonville*

- Large urbanized area type
- 65 mph posted speed limit
- One sided weave (Ramp to Ramp = 5%)



D-Factor	% Heavy Vehicles	Local Adjustment Factor
57.9	4.0	0.98

Segment	Segment Name	Type	Ramp Demand	# of Ramp Lanes	Ramp % Heavy Vehicles	Acc/Dec Length [ft]	Ramp FFS
2	B-C	Off-Ramp	621	1	4.0	220	40
4	D-E	Weave On	801	1	4.0	-	40
4	D-E	Weave Off	567	1	4.0	-	40

Min. Lane Changes				
Short Length	# Weaving Lanes	Freeway-Ramp	Ramp-Freeway	Ramp-Ramp
2,800	2	1	1	-



# FREEPLAN

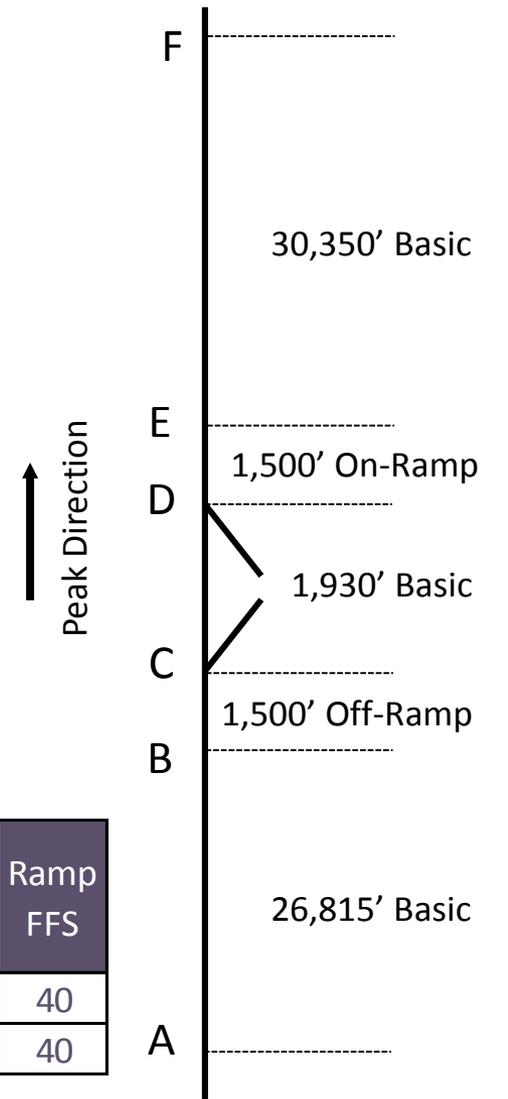
## Workshop 2 Basic/Ramps

*I-75 between CR 673 & CR 470, Bushnell*

- Rural area type
- 70 mph posted speed limit

D-Factor	% Heavy Vehicles	Local Adjustment Factor
56.1	12.0	0.90

Segment	Segment Name	Type	Ramp Demand	# of Ramp Lanes	Ramp % Heavy Vehicles	Acc/Dec Length [ft]	Ramp FFS
2	B-C	Off-Ramp	144	1	12.0	610	40
4	D-E	On-Ramp	162	1	12.0	630	40



35,351 AADT 2 Lanes





# FREEPLAN

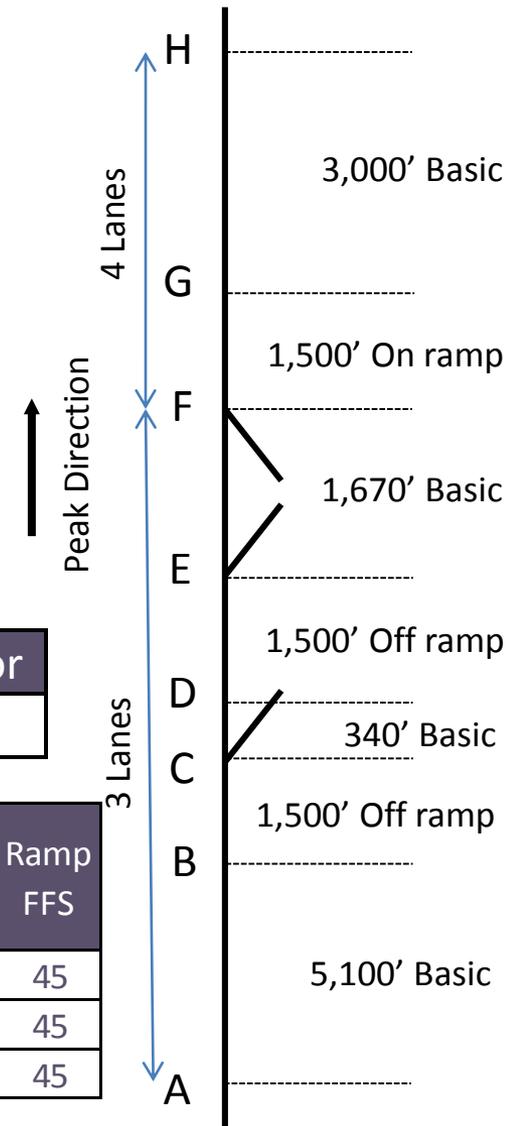
## Workshop 3 Basic/Ramps

*I-95 between FL 104 & FL 102, Jacksonville*

- Large urbanized area type
- 70 mph posted speed limit

D-Factor	% Heavy Vehicles	Local Adjustment Factor
54.5	4.0	0.98

Segment	Segment Name	Type	Ramp Demand	# of Ramp Lanes	Ramp % Heavy Vehicles	Acc/Dec Length [ft]	Ramp FFS
2	B-C	Off-Ramp	387	1	4.0	260	45
4	D-E	Off-Ramp	234	1	4.0	830	45
6	F-G	On-Ramp	828	2	4.0	975	45



72,500 AADT





# FREEPLAN

150,250 AADT  
4 Lanes

## Workshop 4 Basic/Ramps

*I-75 between Royal Palm Blvd & Sheridan St, Weston*

- Large urbanized area type
- 70 mph posted speed limit

D-Factor	% Heavy Vehicles	Local Adjustment Factor
54.4	4.0	0.98

Segment	Segment Name	Type	Ramp Demand	# of Ramp Lanes	Ramp % Heavy Vehicles	Acc/Dec Length [ft]	Ramp FFS
2	B-C	Off-Ramp	504	1	4.0	460	35
4	D-E	Off-Ramp	288	1	4.0	1,500	30
6	F-G	On-Ramp	1,125	1	4.0	1,500	35

