

2015

Quality/Level of Service Training

Planning Level Analysis

Problem Set

June 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 = _____

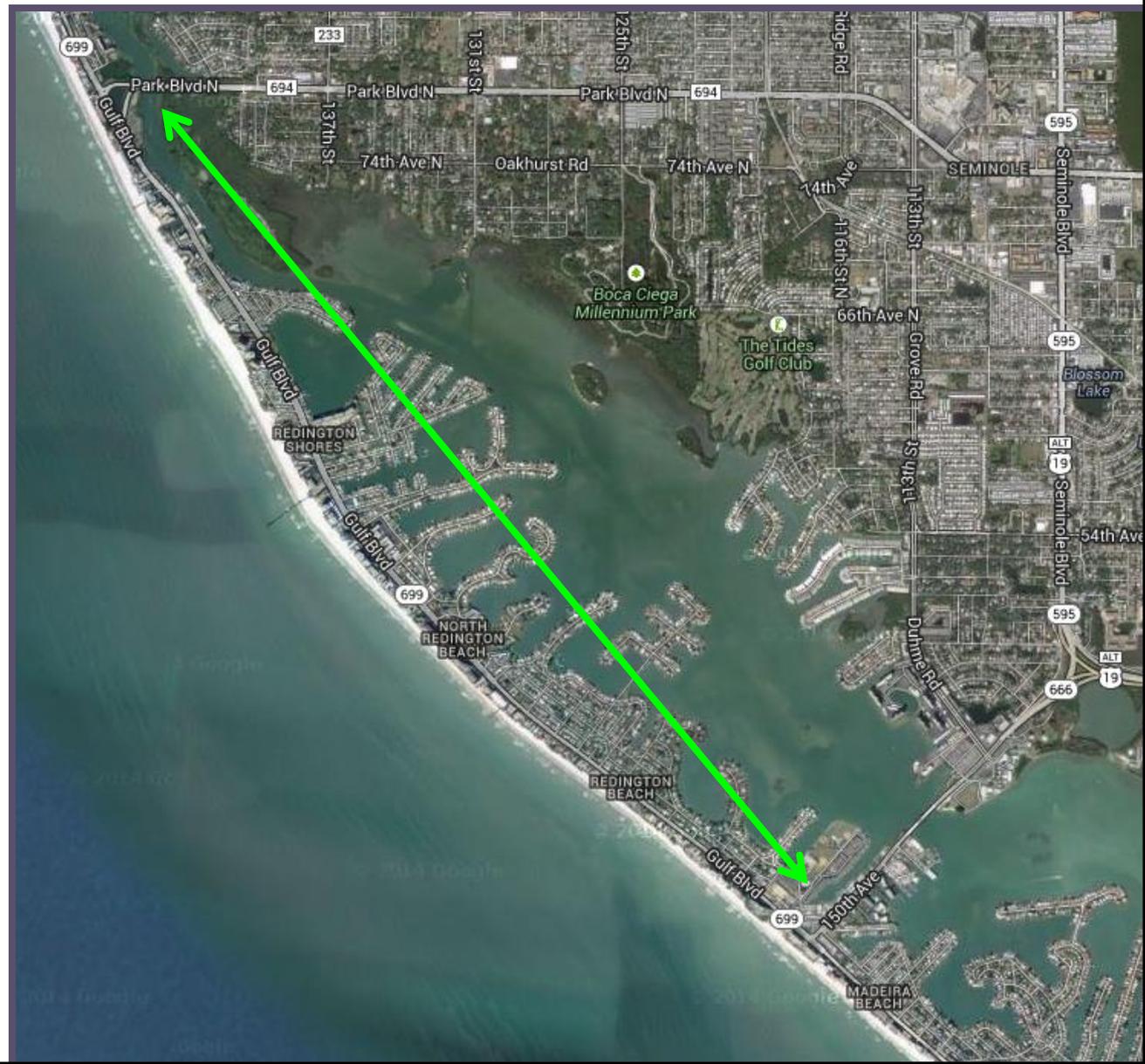
Data Sources Workshop 1

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	

Generalized Annual Average Daily Volumes for Florida's Urbanized Areas

TABLE I

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				
						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	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				

Freeway Adjustments:
 Auxiliary Lanes Present in Both Directions: -20%
 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	72,800
6	Divided	55,000	77,700	98,300	108,800

Uninterrupted Flow Highway Adjustments:
 Lanes 2: Median: Excessive left lanes: Adjustment factors: -5%
 2: Divided: Yes: -5%
 Multi: Undivided: Yes: -5%
 Multi: Undivided: No: -25%

One-Way Facility Adjustment:
 Multiply the corresponding two-direction volumes in this table by 0.6

BICYCLE MODE¹
 Multiply unadjusted vehicle volumes (shown below) by number of directional roadway lanes to determine the way sensitive service volumes.

Shoulder/Bicycle Lane Coverage	Percent			
	B	C	D	E
0-49%	2,900	7,600	19,700	
50-84%	2,100	6,700	19,700	-19,700
85-100%	9,100	19,700	19,700	**

PEDESTRIAN MODE²
 Multiply unadjusted vehicle volumes (shown below) by number of directional roadway lanes to determine the way sensitive service volumes.

Sidewalk Coverage	Percent			
	B	C	D	E
0-49%	4	2,800	8,500	
50-84%	1,600	8,700	15,800	
85-100%	3,800	10,700	17,400	-19,700

BUS MODE (Scheduled Fixed Route)³
 Buses in peak hour by peak direction:

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

Notes:
 1. Values shown are presented as two-way unadjusted peak daily volumes for levels of service and are for the unadjusted peak under steady traffic conditions. The values shown are not a maximum and should be used only for planning purposes. The computer model from which the values in this table were derived for more detailed analysis. The values in this table are computer model values and not field data. For more information, see the Florida Department of Transportation's website at www.floridadot.com.
 2. Level of service for the bicycle and pedestrian modes in this table is based on number of unadjusted vehicles, not number of bicycles or pedestrians, using the factor:
 Lanes 2: Median: Excessive left lanes: Adjustment factors: -5%
 2: Divided: Yes: -5%
 Multi: Undivided: Yes: -5%
 Multi: Undivided: No: -25%
 3. Values are shown only for fixed route in the peak direction of the table.
 ** See the website for more information.
 ** This applies to the level of service table. For the network in peak, values greater than level of service D because of the network in peak have been removed from the table. The level of service table grade (including P) is not applicable because there is an unadjusted value in volume (shoulder) using the appropriate table.

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 (Alter corresponding state volumes by the indicated percent)					Freeway Adjustments					
Non-State Signalized Roadways -10%					Auxiliary Lanes Present in Both Directions +20,000					
Median & Turn Lane Adjustments					Ramp Metering -5%					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors	UNINTERRUPTED FLOW HIGHWAYS					
2	Divided	Yes	No	-5%	2	Undivided	8,600	17,000	24,200	33,300
2	Undivided	No	No	-20%	4	Divided	36,700	51,800	65,600	72,600
Multi	Undivided	Yes	No	-5%	6	Divided	55,000	77,700	98,300	108,800
Multi	Undivided	No	No	-25%	Uninterrupted Flow Highway Adjustments					
-	-	-	Yes	-5%	Lanes	Median	Exclusive left lanes	Adjustment factors		
One-Way Facility Adjustment Multiply the corresponding two-directional volumes in this table by 0.6					2	Divided	Yes	-5%		
					Multi	Undivided	Yes	-5%		
					Multi	Undivided	No	-25%		
BICYCLE MODE ²					PEDESTRIAN MODE ²					
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)					(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)					
Paved Shoulder/Bicycle Lane Coverage					Sidewalk Coverage					
0-49%	B	C	D	E	0-49%	B	C	D	E	
50-84%	*	2,900	7,600	19,700	0-49%	*	*	2,800	9,500	
85-100%	2,100	6,700	19,700	>19,700	50-84%	*	1,600	8,700	15,800	
	9,300	19,700	>19,700	**	85-100%	3,800	10,700	17,400	>19,700	
BUS MODE (Scheduled Fixed Route) ³					BUS MODE (Scheduled Fixed Route) ³					
(Buses in peak hour in peak direction)					(Buses in peak hour in peak direction)					
Sidewalk Coverage	B	C	D	E	Sidewalk Coverage	B	C	D	E	
0-84%	> 5	≥ 4	≥ 3	≥ 2	0-84%	> 5	≥ 4	≥ 3	≥ 2	
85-100%	> 4	≥ 3	≥ 2	≥ 1	85-100%	> 4	≥ 3	≥ 2	≥ 1	

¹ Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless 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 planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

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

³ Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input values default.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D becomes F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is an maximum vehicle volume threshold in the table input values default.

Source: Florida Department of Transportation Systems Planning Office
www.dot.state.fl.us/transportation/systems/planning/tables

2012 FDOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES

GSVT Example 2.A

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)
 - No median/undivided
 - No passing lanes
 - Peak hour directional volume is 450

Generalized Peak Hour Directional Volumes for Florida's Rural Undeveloped Areas and Developed Areas Less Than 5,000 Population¹

TABLE 9

INTERRUPTED FLOW FACILITIES					UNINTERRUPTED FLOW FACILITIES						
STATE SIGNALIZED ARTERIALS					FREEWAYS						
Lanes	Median	B	C	D	E	Lanes	Median	B	C	D	E
1	Undivided	*	670	740	**	2	1,680	2,500	3,040	3,500	3,500
2	Divided	*	1,550	1,580	**	3	2,500	3,720	4,560	5,400	5,400
3	Divided	*	2,360	2,400	**	4	3,360	4,800	6,080	7,200	7,200
Non-State Signalized Roadway Adjustments (Also corresponding peak volumes by the indicated percent) Non-State Signalized Roadways: -10%					Freeway Adjustments Auxiliary Lanes: Present in Both Directions: -1,000						
Median & Turn Lane Adjustments: (Multiply the corresponding directional volumes in this table by 1.2)					UNINTERRUPTED FLOW HIGHWAYS						
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factor	Rural Undeveloped						
1	Divided	Yes	No	+5%	Lanes	Median	B	C	D	E	
1	Undivided	No	No	-20%	1	Undivided	240	430	740	1,490	
2	Divided	Yes	No	-5%	2	Divided	1,340	2,100	2,660	3,020	
2	Undivided	No	No	-20%	3	Divided	2,020	3,150	4,000	4,530	
3	Divided	Yes	Yes	+5%	Developed Areas						
3	Undivided	No	No	-20%	Lanes	Median	B	C	D	E	
1	Undivided	Yes	No	+5%	1	Undivided	450	850	1,200	1,640	
2	Divided	Yes	No	-5%	2	Divided	1,350	2,120	2,730	3,110	
3	Divided	Yes	Yes	+5%	3	Divided	2,020	3,180	4,090	4,670	
One-Way Facility Adjustment: Multiply the corresponding directional volumes in this table by 1.2					Passing Lane Adjustment: Alter LOS B-D volumes in proportion to the passing lane length to the highway segment length						
BICYCLE MODE² (Multiply unadjusted vehicle volume shown below by number of directional roadway lanes to determine two-way maximum service volume.)											
Rural Undeveloped											
Paved Shoulder/Bicycle Lane Coverage	B	C	D	E							
0-49%	*	70	110	170							
50-84%	*	60	120	180	580						
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%	*	320	1,000	>1,000	**						
PEDESTRIAN MODE³ (Multiply unadjusted vehicle volume shown below by number of directional roadway lanes to determine two-way maximum service volume.)											
Sidewalk Coverage	B	C	D	E							
0-49%	*	80	120	460							
50-84%	*	80	430	770							
85-100%	*	180	520	860	>1,000						

¹ Values shown are presented in each lane directional volume for level of service and not for the entire facility (two-way volume). The table does not contain a row for 1.5 lanes. For general planning applications, the computer models from which the table is derived should be used for more specific planning applications. The table and during computer models should not be used for the purpose of determining facility, where more refined techniques exist. Calculations are based on planning applications in the Highway Capacity Manual and the Texas Capacity and Quality of Service Manual.
² Level of service for the bicycle and pedestrian modes in this table is based on number of directional vehicles, not number of bicycles or pedestrians using the facility.
³ Criteria for sidewalk table are input table defaults.
⁴ Not applicable for the level of service letter grade. For the maximum table, volume presented in each cell is based on 100% of maximum possible grade. Lane values are based on the level of service letter grade. For the bicycle mode, the level of service letter grade (including P) is not applicable to the table as an maximum vehicle volume threshold using table input table defaults.
 Source: Florida Department of Transportation, Greenway Planning Office, www.floridadot.com, www.txdot.gov, www.txdot.gov/hcm

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 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 Population¹ 12/12/12

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	1,380	**	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 Adjustment (After corresponding row volumes by the indicated percent)
 Non-State Signalized Roadways - 10%

Freeway Adjustment:
 Auxiliary Lanes Present in Both Directions = -1.00

Median & Turn Lane Adjustment:
 Exclude Right Lanes Adjustment Factors

Lanes	Median	Exclude Left Lanes	Exclude Right Lanes	Adjustment Factors
1	Divided	Yes	No	-2%
1	Undivided	No	No	-20%
Mult	Undivided	Yes	No	-5%
Mult	Undivided	No	No	-2%
-	-	-	Yes	-3%

One-Way Facility Adjustment (Multiply the corresponding directional volumes in this table by 1.2)

BICYCLE MODE!
 Multiply unadjusted vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Rural Undeveloped					Developed Areas				
Paved Shoulder/Bicycle Lane Coverage	B	C	D	E	B	C	D	E	
0-49%	*	70	110	170	*	120	260	840	
50-84%	*	60	120	180	380	100	240	720	
85-100%	*	140	210	1,000	>1,000	220	1,000	>1,000	

PEDESTRIAN MODE!
 Multiply unadjusted vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Rural Undeveloped					Developed Areas				
Sidewalk Coverage	B	C	D	E	B	C	D	E	
0-49%	*	*	120	460	*	*	120	460	
50-84%	*	*	80	410	770	*	*	80	
85-100%	*	*	180	520	860	>1,000	*	*	

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	4,090	4,530

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	4,090	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 Areas¹

TABLE 8

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS						FREEWAYS					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
Class I (40 mph or higher posted speed limit)						Freeway Adjustments					
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	
Class II (35 mph or lower posted speed limit)						5	5,300	7,080	8,440	9,440	
Lanes	Median	B	C	D	E	Auxiliary Lane					
1	Undivided	*	330	680	710	Ramp					
2	Divided	*	500	1,460	1,600	Lane					
3	Divided	*	810	2,280	2,420	Merging					
Non-State Signalized Roadway Adjustments						Uninterrupted Flow Highway Adjustments					
(Alter corresponding state volumes by the indicated percent.)						Uninterrupted Flow Highways					
Non-State Signalized Roadways: -10%						Lanes	Median	B	C	D	E
Median & Turn Lane Adjustments						1	Undivided	450	850	1,200	1,640
Lanes	Median	Left Lanes	Right Lanes	Adjustment Factors		2	Divided	1,740	2,450	3,110	3,440
1	Divided	Yes	No	+5%		3	Divided	2,610	3,680	4,660	5,170
2	Undivided	No	No	-20%		Uninterrupted Flow Highway Adjustments					
Mult	Undivided	Yes	No	-5%		Lanes	Median	Exclusive Left Lanes	Adjustment Factors		
Mult	Undivided	No	No	-20%		1	Divided	Yes	+5%		
-	-	-	Yes	+5%		Mult	Undivided	Yes	-5%		
One-Way Facility Adjustment						Mult	Undivided	No	-25%		
Multiply the corresponding directional volumes in this table by 1.2						BICYCLE MODE ²					
(Multiply interrupted roadway volumes below by number of directional roadway lanes to determine two-way maximum service volumes.)						Paved Shoulder Bicycle Lane Coverage					
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	
85-100%	**	380	1,000	>1,000	**	PEDESTRIAN MODE ³					
(Multiply interrupted roadway volumes below by number of directional roadway lanes to determine two-way maximum service volumes.)						Sidewalk Coverage					
Sidewalk Coverage	B	C	D	E		0-49%	*	140	480		
50-84%	*	80	440	800		85-100%	**	200	540	880	>1,000
85-100%	**	200	540	880	>1,000	BUS MODE (Scheduled Fixed Route) ⁴					
(Based on peak hour in peak direction)						Sidewalk Coverage					
Sidewalk Coverage	B	C	D	E		0-84%	> 5	≥ 4	≥ 3	≥ 2	
85-100%	> 4	≥ 3	≥ 2	≥ 1		Source:					

¹Volume values are presented by peak hour directional volume for level of service and are for the entire network, unless values specifically noted. This table does not constitute a contract and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific engineering applications. The table and associated computer models should not be used for similar or alternative designs, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

²Level of service for the bicycle and pedestrian modes in this table is based on number of interrupted roadway lanes, not number of bicycle or pedestrian travel lanes.

³Does not include volume for the peak lane in the single direction of the higher traffic flow.

⁴ Cannot be achieved using 10 ft apart vehicle detection.

** Not applicable for that level of service letter grade. For the maximum grade, volume greater than level of service D because of lower intersection saturation lanes have included. For the bicycle mode, the level of service letter grade (including F) not applicable to the mode there is an associated vehicle volume threshold to use that letter grade.

Source: Florida Department of Transportation, Systems Planning Office, www.dot.state.fl.us/transportation/plan/plan.htm

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

BICYCLE MODE²				
(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	**

Generalized Annual Average Daily Volumes for Florida's Urbanized Areas

TABLE 1 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	93,200	116,600	130,600	
6	Divided	**	58,400	59,900	**	8	93,500	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	289,900	
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	
(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	63,600 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 ²				
(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 ³				
(Multiply associated 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	8,700	9,700
50-84%	1,600	8,700	15,800	15,800
85-100%	3,800	10,700	17,400	19,700

BUS MODE (Scheduled Fixed Route) ³				
(Buses in peak hour in peak direction)				
Sidewalk Coverage	B	C	D	E
0-49%	> 4	-1	-2	-2
50-84%	> 4	-2	-2	-2
85-100%	> 4	-2	-2	-2

Source: Florida Department of Transportation, Division Planning Office, www.dot.state.fl.us/planning/transportation_data/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 ²				
(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

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	

UNINTERRUPTED FLOW FACILITIES					
FREEWAYS					
Core Urbanized					
Lanes	B	C	D	E	
4	47,400	64,000	77,900	84,600	
6	69,900	93,200	116,600	130,600	
8	93,500	126,400	154,300	176,600	
10	115,100	159,700	194,500	222,700	
12	162,400	218,700	256,600	289,900	

UNINTERRUPTED FLOW FACILITIES					
FREEWAYS					
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	

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	63,600	72,600
6	Divided	55,000	77,700	98,300	108,800

UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	Exclusive left lane	Adjustment factor		
2	Divided	Yes	+5%		
Multi	Undivided	No	-5%		

BUS MODE (Scheduled Fixed Route) ³					
Sidewalk Coverage	B	C	D	E	
0-4%	-	-	-	-	-
5-4%	-	-	-	-	-
5-100%	-4	-3	-2	-1	

Source: Florida Department of Transportation, Division Planning Office, www.dot.state.fl.us/planning/transportation/tables.html

2012 FOOT 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					
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	* 37,800	39,800	**		6	69,900	95,200	116,600	130,600	
6	Divided	* 58,400	59,900	**		8	85,500	116,400	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	
Class II (35 mph or slower posted speed limit)						Urbanized					
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	

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

Median & Turn Lane Adjustments						UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	Exclusive 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
2	Undivided	No	No	+20%		4	Divided	16,700	51,800	65,600	72,600
Multi	Undivided	Yes	No	-5%		6	Divided	55,000	77,700	98,300	108,800
Multi	Undivided	No	No	+20%							
		Yes	Yes	-5%							

One-Way Facility Adjustment		Uninterrupted Flow Highway Adjustment	
Multiply the corresponding two-directional volumes in this table by 0.6		Lanes	Adjustment Factors
2	Divided	Yes	-5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

BICYCLE MODE ¹					
Multiply sanctioned 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%	9,200	19,700	-19,700	**	

PEDESTRIAN MODE ¹					
Multiply sanctioned 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	8,700	15,800		
50-84%	1,600	8,700	15,800		
85-100%	3,800	10,700	17,400	-19,700	

BUS MODE (Scheduled Fixed Route) ³					
(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	

BUS MODE (Scheduled Fixed Route)³
(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

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%

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

Generalized Annual Average Daily Volumes for Florida's Transitioning Areas and Areas Over 5,000 Not in Urbanized Areas¹

TABLE 2

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS						FREEWAYS					
Class I (40 mph or higher posted speed limit)						Freeway Adjustments					
Lanes	Median	B	C	D	E	Auxiliary Lanes		Ramp		Present in Both Directions	
2	Undivided	*	14,400	16,300	**	+ 20,000		Measuring		-5%	
4	Divided	*	34,000	35,500	**						
6	Divided	*	52,100	53,500	**						
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						
Non-State Signalized Roadway Adjustments											
(Other corresponding unit volumes by the indicated percent)											
Non-State Signalized Roadways						-10%					
Median & Turn Lane Adjustments											
Lanes	Median	Left Lanes	Right Lanes	Exclusion	Adjustment Factors						
2	Divided	Yes	No	+	+5%						
2	Undivided	No	No	-	-20%						
Multi	Undivided	Yes	No	-	-5%						
Multi	Undivided	No	No	-	-25%						
One-Way Facility Adjustment											
Multiply the corresponding two-directional volumes in this table by 0.6											
BICYCLE MODE²											
Multiply unadjusted vehicle volumes shown below by number of directional roadway lanes to determine two-way unadjusted service volumes.											
Paved Shoulder/Bicycle Lane Coverage											
0-49%	B	C	D	E							
50-84%	*	2,600	6,100	19,500							
85-100%	*	1,900	5,500	18,400	>19,500						
		7,500	19,500	19,500	**						
PEDESTRIAN MODE³											
Multiply unadjusted vehicle volumes shown below by number of directional roadway lanes to determine two-way unadjusted service volumes.											
Sidewalk Coverage											
0-49%	B	C	D	E							
50-84%	*	1,600	8,600	13,600							
85-100%	*	3,800	10,500	17,100	>19,500						
BUS MODE (Scheduled Fixed Route)⁴											
(Does not peak hour to peak direction)											
Sidewalk Coverage	B	C	D	E							
0-84%	-	4	3	2							
85-100%	-	4	2	2	1						

2012 FDOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES

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 Areas¹ 12/18/12

INTERRUPTED FLOW FACILITIES					UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS					FREEWAYS					
Class I (60 mph or higher posted speed limit)					Class I (60 mph or higher posted speed limit)					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E
2	Undivided	*	14,400	16,200	**	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	55,500	**	8	85,100	113,700	133,200	150,000
Class II (35 mph or slower posted speed limit)					Class II (35 mph or slower posted speed limit)					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E
2	Undivided	*	6,500	13,300	14,200	2	Divided	Yes	Ramp	Measuring
4	Divided	*	9,900	28,800	31,600	4	Divided	Yes	-20%	-30%
6	Divided	*	16,000	44,900	47,600	6	Divided	Yes	-25%	-25%
Non-State Signalized Roadway Adjustments					Non-State Signalized Roadways -10%					
Median & Turn Lane Adjustments					Median & Turn Lane Adjustments					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors	UNINTERRUPTED FLOW HIGHWAYS					
2	Divided	Yes	No	+5%	Lanes	Median	B	C	D	E
2	Undivided	No	No	-20%	2	Undivided	9,200	17,500	24,400	33,500
Multi	Undivided	Yes	No	-5%	4	Divided	35,500	49,600	63,900	69,600
Multi	Undivided	No	No	-25%	6	Divided	52,800	74,500	94,300	104,500
-	-	-	Yes	+5%	Uninterrupted Flow Highway Adjustments					
One-Way Facility Adjustment					Uninterrupted Flow Highway Adjustments					
Multiply the corresponding two-directional volumes in this table by 0.8					Multiply the corresponding two-directional volumes in this table by 0.8					
BICYCLE MODE²										
Obtaining unadjusted vehicle volumes (shown below) by number of directional roadway lanes to determine two-way maximum service volumes.)										
Fixed Shoulder/Bicycle Lane Coverage										
	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 MODE³										
Obtaining unadjusted 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	9,400						
50-84%	*	1,600	8,600	15,600						
85-100%	*	3,800	10,500	17,100						
BUS MODE (Scheduled Fixed Route)⁴										
(Shown in peak hour in peak direction)										
	B	C	D	E						
0-84%	-5	-4	-3	-2						
85-100%	-4	-3	-2	-1						

¹ Values shown are presented as two-way annual average daily volume for both directions and are for the urban/transitioning areas specifically noted. The table also contains volumes that should be used only for general planning purposes. The complete median flow table is detailed below to be used for more specific planning applications. The table and design criteria models should only be used for roadway design purposes. When used for design purposes, the table should be used in conjunction with the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

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

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

⁴ Counts are calculated using table top vehicle counts.

⁵ Not applicable to the dual level of service table grade. For the non-metropolitan, urban/transitioning level of service D because of heavy intersection operation, lane counts are reduced. For the bicycle mode, the level of service being grade (table top) is not achievable because there is no minimum vehicle volume threshold using table top vehicle counts.

Source: Florida Department of Transportation
Transportation Planning Office
http://www.flhwy.com/tables/tables.html

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

GSVT Example 7

Determine the max. service volume for LOS E:

- In terms of AADT
- In an urbanized area
- For a state signalized arterial with:
 - One-way
 - 2 lanes in travel direction
 - 30 mph speed limit

One-Way Facility Adjustment
Multiply the corresponding two-directional volumes in this table by 0.6

Generalized Annual Average Daily Volumes for Florida's Urbanized Areas

TABLE 1

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	54,000	77,300	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	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	123,500	
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	210,200	
Non-State Signalized Roadway Adjustments (Use corresponding two-volume)						Freeway Adjustments					
Non-State Signalized Roadways = -10%						Auxiliary Lane Present in Both Directions = -20.00%					
Ramp Metering = -5%											
Median & Turn Lane Adjustments						UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factor		Lanes	Median	B	C	D	E
2	Undivided	Yes	No	+5%		2	Undivided	8,600	17,000	24,200	33,300
4	Undivided	No	No	-20%		4	Divided	36,700	51,800	65,600	72,600
Multi	Undivided	Yes	No	-5%		6	Divided	55,000	77,700	98,500	108,800
Multi	Undivided	No	No	-25%							
-	-	-	Yes	+5%		Uninterrupted Flow Highway Adjustments					
One-Way Facility Adjustment (Multiply the corresponding two-directional volumes in this table by 0.6)						Lanes					
						2 Divided Yes -5%					
						Multi Undivided Yes -5%					
						Multi Undivided No -25%					
BICYCLE MODE¹ (Multiply reported vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)						¹ Values shown are presented as two-way annual average daily volumes for levels of service and are for the urbanized area values specifically noted. This table does not constitute a model and should be used only for general planning applications. The original source from which these data were derived is not more specific planning application. The table and existing computer models should be used for detailed or preliminary design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.					
Paved Shoulder/Bicycle Lane Coverage						² Level of service for the bicycle and pedestrian modes in this table is based on number of unobstructed vehicles, not number of bicycles or pedestrians, unless the facility is a multi-lane facility.					
0-49%						³ Peak hour values are only for the peak hour in the single direction of the higher traffic flow.					
50-84%						* Cannot be included since table input values default.					
85-100%						** Not applicable for that level of service lane grade. For the unobstructed mode, to have greater than level of service D, because unobstructed mode has been reached. For the bicycle mode, the level of service lane grade (including 2%) is not allowed to be more than 4.0% maximum, which volume threshold is using table input values default.					
						Source: Florida Department of Transportation, Gainesville Office, www.dot.state.fl.us/transportation/traffic/default.htm					
						2012 FOOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES					

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

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

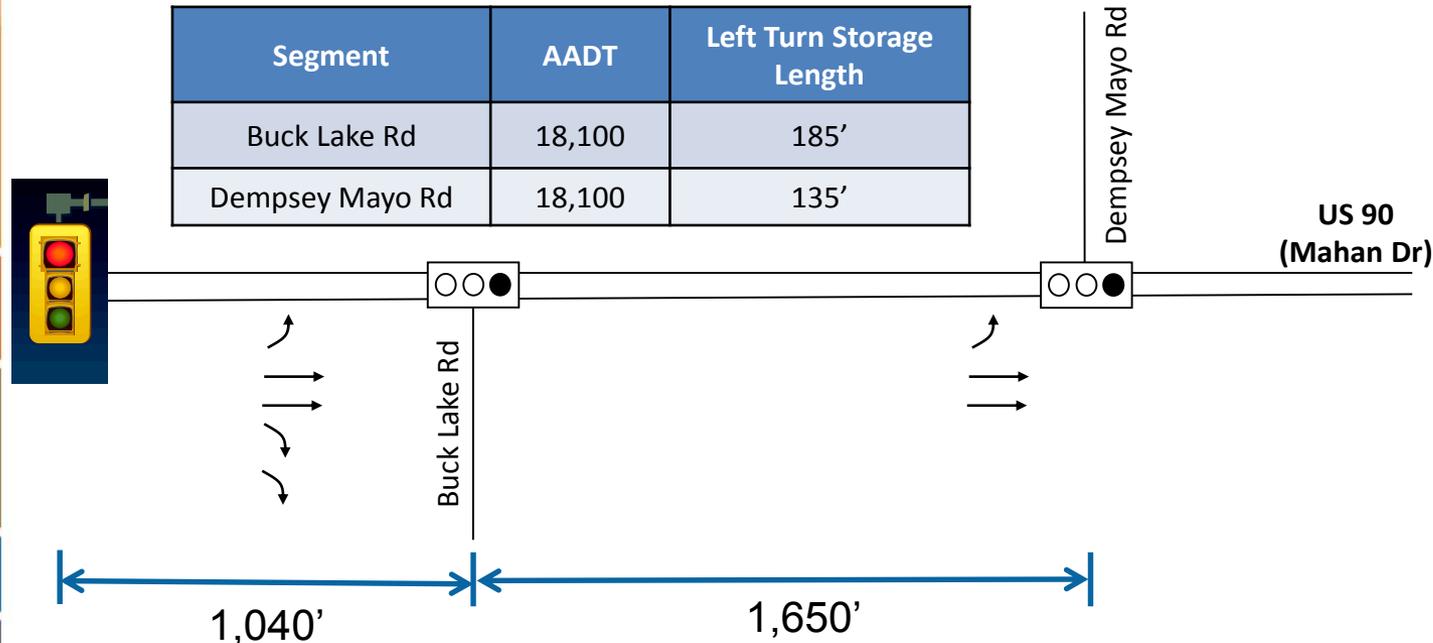
Example 1 *Planning-Level Inputs, Auto Only*

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'



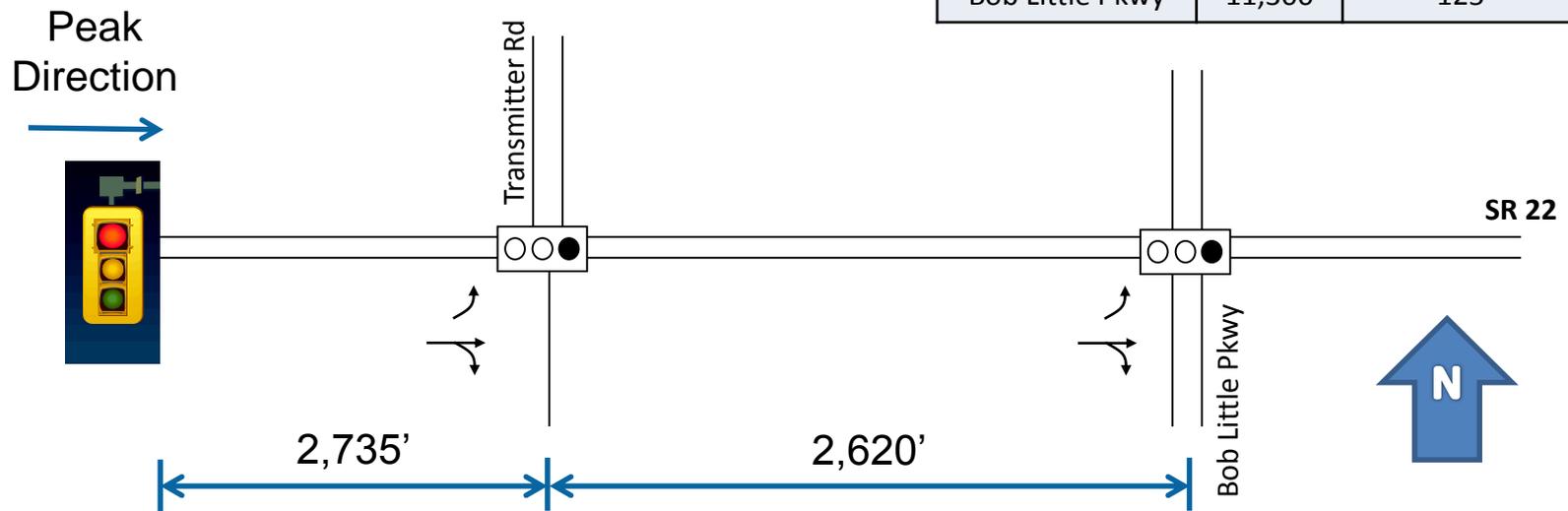
ARTPLAN

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'



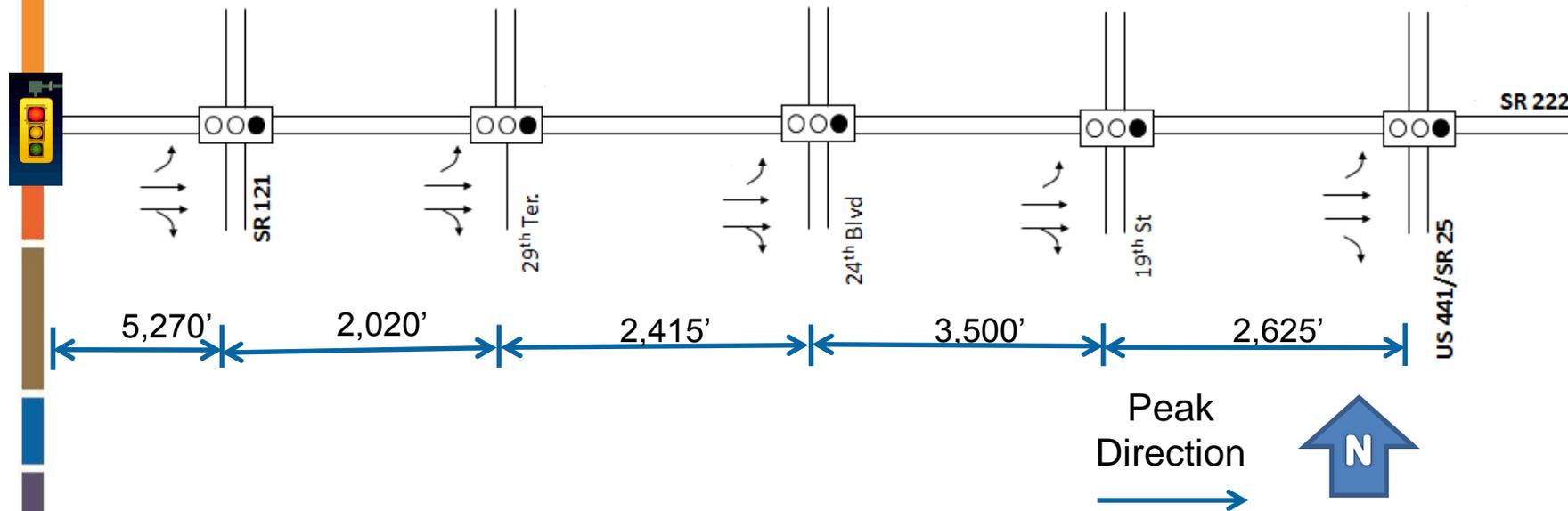
ARTPLAN

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 th Terr.	5	5	150'	27,000
24 th Blvd.	5	5	175'	25,000
19 th St.	5	5	150'	25,000
US 441	10	12	135'	25,500



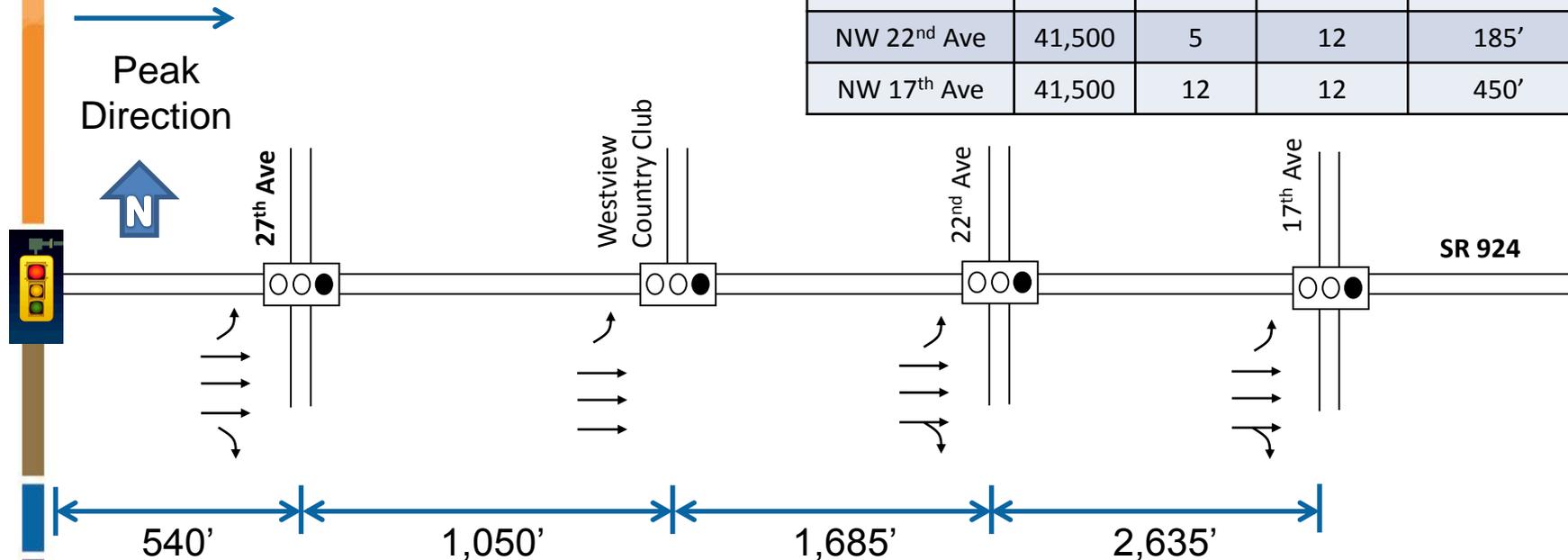
ARTPLAN

Workshop 3 *Known Inputs & Multimodal Analysis*

State Route 924 between 27th Ave & 17th Ave, Miami

- Non-restrictive median west of 27th Ave
- 40 mph posted speed limit

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

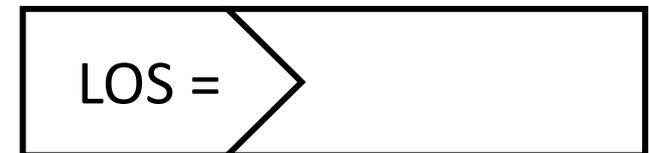


ARTPLAN

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?

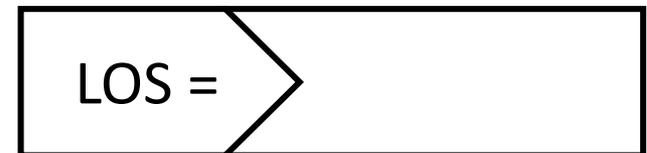


ARTPLAN

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?

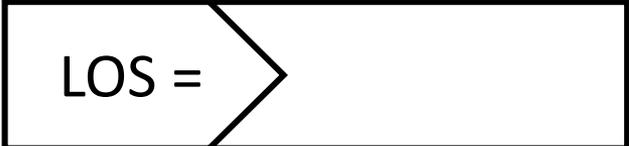


ARTPLAN

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?

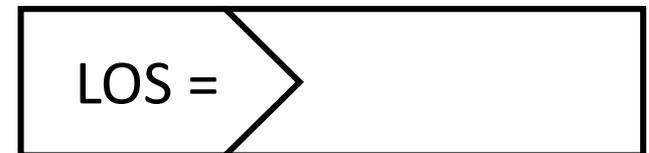
LOS = 

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?

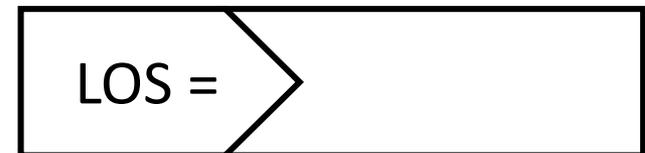


ARTPLAN

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 2nd segment?

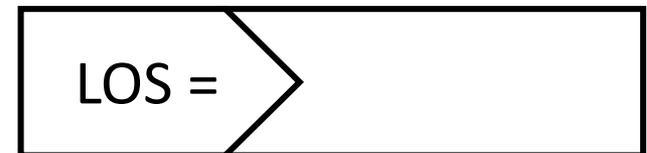


ARTPLAN

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~~

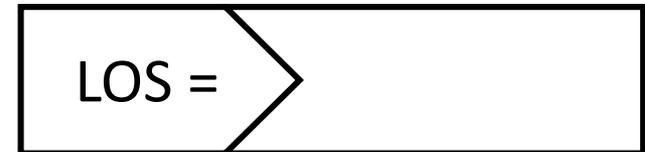
What is the pedestrian LOS if a sidewalk with typical separation were added to the whole facility?



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?

	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%	Excellent
Freq. =	Second	Third	2	No	60%	Excellent
Freq. =	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?

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

ARTPLAN

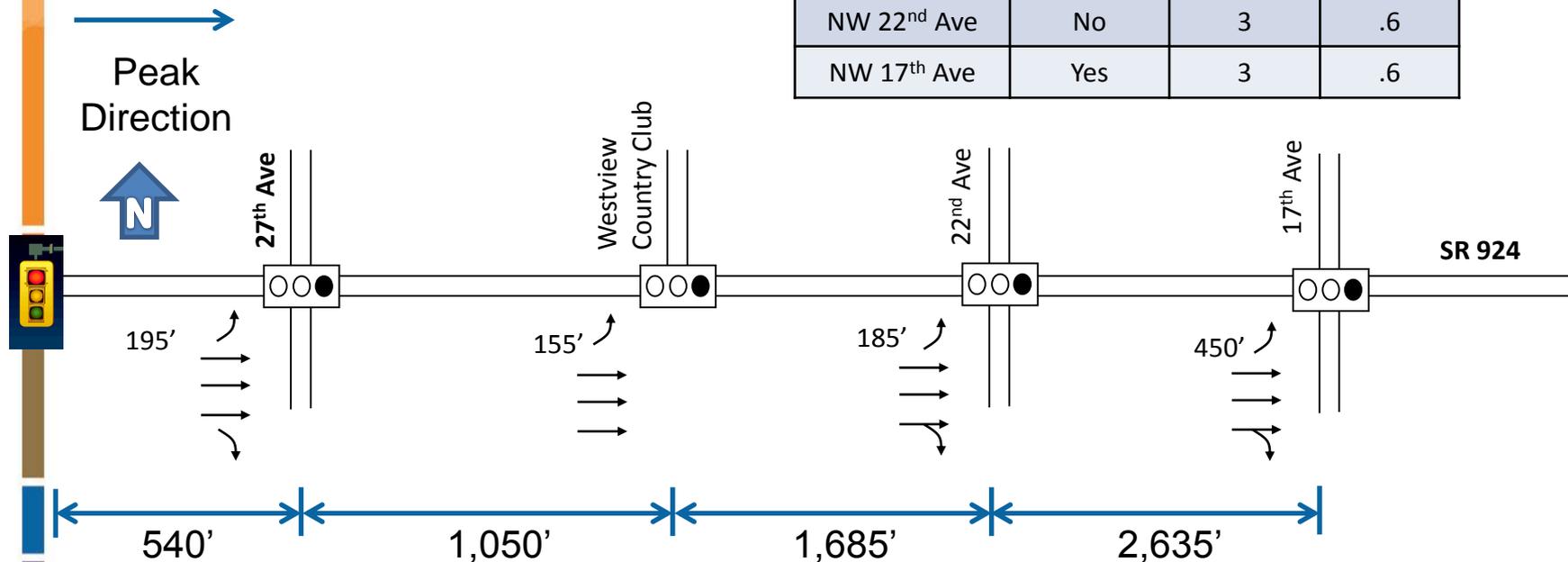
Use data file saved from Workshop 3 in ARTPLAN unit for this workshop

Workshop 5 *Known Inputs & Multimodal Analysis*

State Route 924 between 27th Ave & 17th Ave, Miami

- Fully actuated signal

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



HIGHPLAN

Example 1 Basic/Ramps/Ramp Overlap

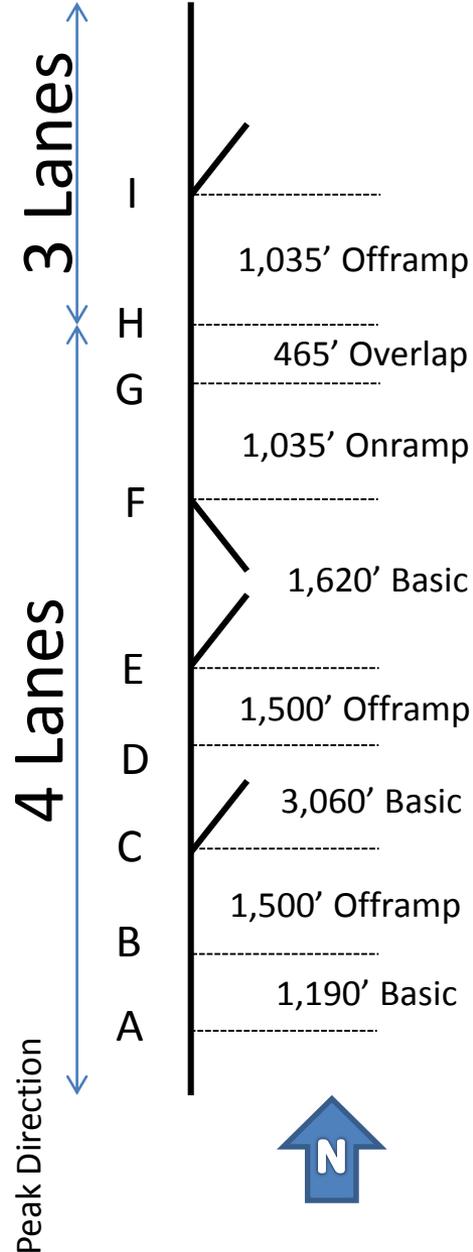
I-4 between Princeton St & Lee Rd, Orlando

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

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

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

138,250 AADT



HIGHPLAN

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%)

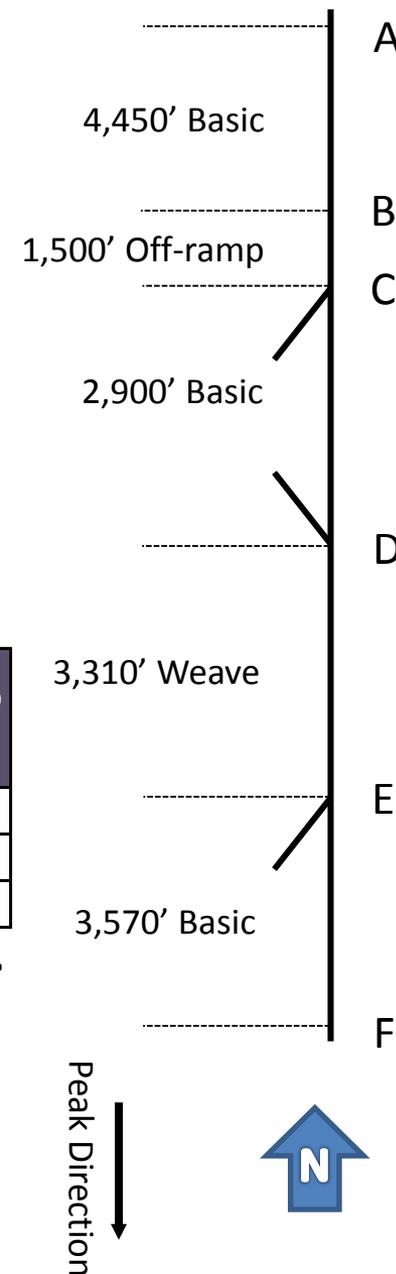
Segment	Segment Name	Type	Ramp Demand	# of Ramp Lanes	Ramp % Heavy Vehicles	Acc/Dec Length [ft]	Ramp FFS
2	B-C	Off-Ramp	621	1	4.0	220	40
4	D-E	Weave On	801	1	4.0	-	40
4	D-E	Weave Off	567	1	4.0	-	40

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

75,000 AADT

2 Lanes

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



HIGHPLAN

Workshop 2 Basic/Ramps

I-75 between CR 673 & CR 470, Bushnell

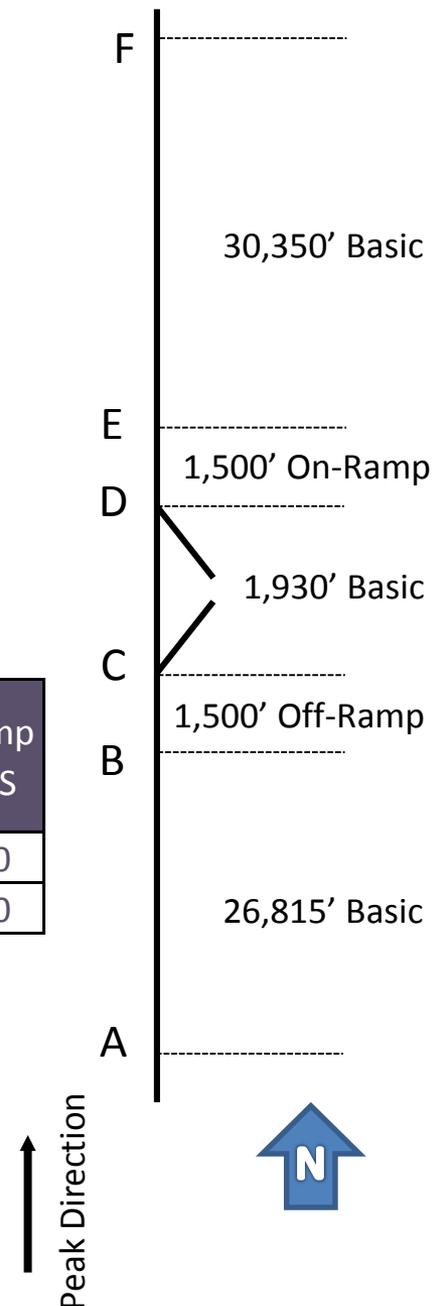
- Rural area type
- 70 mph posted speed limit

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



HIGHPLAN

Workshop 3 Basic/Ramps

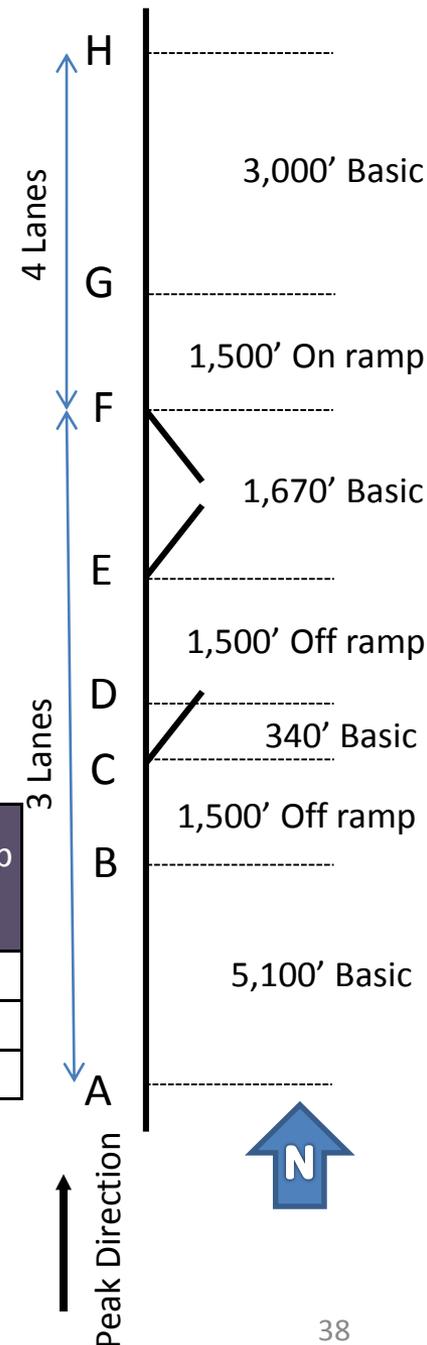
I-95 between FL 104 & FL 102, Jacksonville

- 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



HIGHPLAN

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

150,250 AADT

4 Lanes

