

# 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 = \_\_\_\_\_

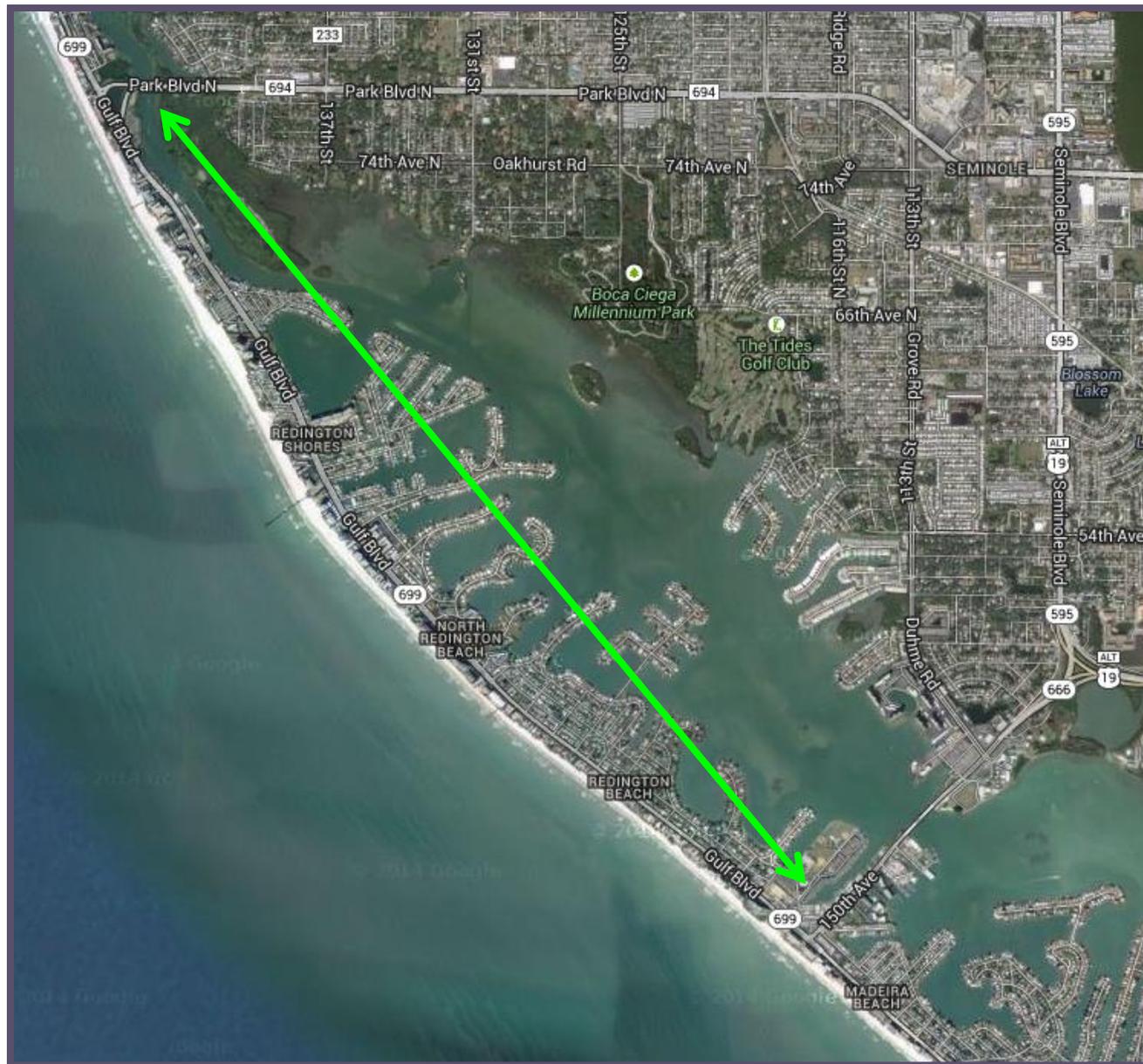
# Data Sources Workshop 1

## 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 12/01/12

| 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   | 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   | 21,300    | 50,000    | 50,900     |    | 8                                                                                                                                         | 91,500    | 123,500   | 148,700     | 166,800           |         |
| 8                                                                                                                                         | Divided   | 32,000    | 67,500    | 68,100     |    | 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       |
| 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            | 72,800  |
| Multi                                                                                                                                     | Undivided | Yes       | No        | -5%        |    | 6                                                                                                                                         | Divided   | 55,000    | 77,700      | 98,300            | 108,800 |
| Multi                                                                                                                                     | Undivided | No        | Yes       | -25%       |    |                                                                                                                                           |           |           |             |                   |         |
|                                                                                                                                           |           |           |           |            |    |                                                                                                                                           |           |           |             |                   |         |
| One-Way Facility Adjustment                                                                                                               |           |           |           |            |    | Uninterrupted Flow Highway Adjustments                                                                                                    |           |           |             |                   |         |
| Multiply the corresponding two-direction volumes in this table by 0.6                                                                     |           |           |           |            |    | Lanes <th>Median</th> <th>Enclosure</th> <th>Adj. Factor</th> <th>Adjustment Factor</th>                                                  | Median    | Enclosure | Adj. Factor | Adjustment Factor |         |
|                                                                                                                                           |           |           |           |            |    | 2                                                                                                                                         | Divided   | Yes       | -5%         |                   |         |
|                                                                                                                                           |           |           |           |            |    | Multi                                                                                                                                     | Undivided | Yes       | -5%         |                   |         |
|                                                                                                                                           |           |           |           |            |    | Multi                                                                                                                                     | Undivided | No        | -25%        |                   |         |
| BICYCLE MODE <sup>1</sup>                                                                                                                 |           |           |           |            |    | PEDESTRIAN MODE <sup>2</sup>                                                                                                              |           |           |             |                   |         |
| Oblique unidirectional vehicle volumes shown below by number of directional roadway lanes to determine the way direction service volumes. |           |           |           |            |    | Oblique unidirectional vehicle volumes shown below by number of directional roadway lanes to determine the way direction service volumes. |           |           |             |                   |         |
| Paved Shoulder/Bicycle Lanes Coverage                                                                                                     |           |           |           |            |    | Sidewalk Coverage                                                                                                                         |           |           |             |                   |         |
| 0-49%                                                                                                                                     | B         | C         | D         | E          |    | 0-49%                                                                                                                                     | B         | C         | D           | E                 |         |
| 50-84%                                                                                                                                    | 2,900     | 7,600     | 19,700    |            |    | 50-84%                                                                                                                                    | 1,600     | 8,700     | 15,800      |                   |         |
| 85-100%                                                                                                                                   | 9,100     | 19,700    | 19,700    | **         |    | 85-100%                                                                                                                                   | 3,800     | 10,700    | 17,400      | 19,700            |         |
| BUS MODE (Scheduled Fixed Route) <sup>3</sup>                                                                                             |           |           |           |            |    | Buses in peak hour by peak direction                                                                                                      |           |           |             |                   |         |
| Sidewalk Coverage                                                                                                                         |           |           |           |            |    | Buses in peak hour by peak direction                                                                                                      |           |           |             |                   |         |
| 0-84%                                                                                                                                     | B         | C         | D         | E          |    | 0-84%                                                                                                                                     | B         | C         | D           | E                 |         |
| 85-100%                                                                                                                                   | 1         | 2         | 3         | 2          |    | 85-100%                                                                                                                                   | 1         | 2         | 3           | 2                 |         |

<sup>1</sup> Values shown are presented as two-way average daily volumes for the level of service and for the corresponding peak-hour volume specifically stated. The values shown are neither a maximum nor a minimum but only a generalizing application. The computer model from which the values are derived should be used for more precise volume estimations. The only real design response models should not be used for volume or pavement design. When more detailed volume data is available, use that data in place of the values shown in this table.

<sup>2</sup> Values shown are based on a two-way average daily volume for the level of service and for the corresponding peak-hour volume specifically stated. The values shown are neither a maximum nor a minimum but only a generalizing application. The computer model from which the values are derived should be used for more precise volume estimations. The only real design response models should not be used for volume or pavement design. When more detailed volume data is available, use that data in place of the values shown in this table.

<sup>3</sup> Values shown are based on a two-way average daily volume for the level of service and for the corresponding peak-hour volume specifically stated. The values shown are neither a maximum nor a minimum but only a generalizing application. The computer model from which the values are derived should be used for more precise volume estimations. The only real design response models should not be used for volume or pavement design. When more detailed volume data is available, use that data in place of the values shown in this table.

Source: Florida Department of Transportation, Florida Planning Unit, [www.floridadot.com/transportation/tpu/tpu.html](http://www.floridadot.com/transportation/tpu/tpu.html)

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<br>Present in Both Directions<br>+ 20,000 |  | Ramp<br>Metering<br>+ 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 | 1,580 | **                            | 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<br>(After corresponding row volumes by the indicated percent) |  |  |  |  | Freeway Adjustment:<br>Auxiliary Lanes<br>Present in Both Directions |  |  |  |  |
|--------------------------------------------------------------------------------------------------------|--|--|--|--|----------------------------------------------------------------------|--|--|--|--|
| Non-State Signalized Roadways - 10%                                                                    |  |  |  |  | -1,000                                                               |  |  |  |  |

| Median & Turn Lane Adjustments |           |                      |                       |                   | 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 |
| Mult                           | Undivided | Yes                  | No                    | -5%               | 2                           | Divided   | 1,340 | 2,100 | 2,660 | 3,020 |
| Mult                           | Undivided | No                   | No                    | -25%              | 3                           | Divided   | 2,020 | 3,150 | 4,000 | 4,530 |
| -                              | -         | -                    | Yes                   | -5%               | Developed Areas             |           |       |       |       |       |
|                                |           |                      |                       |                   | Lanes                       | 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 |

| One-Way Facility Adjustment<br>Multiply the corresponding directional volumes in this table by 1.2 |     |     |       |        |
|----------------------------------------------------------------------------------------------------|-----|-----|-------|--------|
| Rural Undeveloped                                                                                  |     |     |       |        |
| 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 |     |       |        |       |
|-----------------|-----|-------|--------|-------|
| 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 |       |

**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 |     |     |       |        |
|-------------------|-----|-----|-------|--------|
| 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 |     |       |        |       |
|-----------------|-----|-------|--------|-------|
| 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 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%             | 80  | 120 | 460 |        |
| 50-84%            | 80  | 80  | 430 | 770    |
| 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 | 4,000 | 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 | 4,000 | 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                                         | Median | 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 | 5,140 |   |
| 3                                             | Divided   | * | 2,670 | 2,740 | ** | 4                                             | 4,360  | 5,680 | 6,760 | 7,000 |   |
|                                               |           |   |       |       |    | 5                                             | 5,300  | 7,080 | 8,440 | 9,440 |   |

**Freeway Adjustments**

| Adjustment     | Rate  |
|----------------|-------|
| Auxiliary Lane | +100% |
| Ramp Metering  | -5%   |

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

**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%                |

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

**BICYCLE MODE<sup>2</sup>**  
(Multiply annotated vehicle volumes 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%                          | * | 140 | 320   | 1,000  |
| 50-84%                         | * | 100 | 260   | 840    |
| 85-100%                        | * | 380 | 1,000 | >1,000 |

**PEDESTRIAN MODE<sup>3</sup>**  
(Multiply annotated 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%             | * | 140 | 480 |     |
| 50-84%            | * | 80  | 440 | 800 |
| 85-100%           | * | 200 | 540 | 880 |

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

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

**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 |

**Uninterrupted Flow Highway Adjustments**

| Lanes | Median    | Exclusive Left Lanes | Adjustment Factors |
|-------|-----------|----------------------|--------------------|
| 1     | Divided   | Yes                  | +5%                |
| Multi | Undivided | Yes                  | -5%                |
| Multi | Undivided | No                   | -25%               |

**Notes:**

1. Values shown are presented as peak hour directional volumes for levels of service and are for the urban/transitioning areas only. For general planning applications, the computer results for which this table is derived should be used for more specific urbanized areas. The table and associated computer results 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.
2. 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.
3. Does not include volume for the peak hour in the single direction of the higher traffic flow.
4. Cannot be achieved using toll to alter vehicle deficits.

**Source:** Florida Department of Transportation, Systems Planning Office  
[www.dot.state.fl.us/commoanalyzer/tables/tables.htm](http://www.dot.state.fl.us/commoanalyzer/tables/tables.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

| <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<br>Shoulder/Bicycle<br>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%            |

| Median & Turn Lane Adjustments |           |            |             |           |                   | UNINTERRUPTED FLOW HIGHWAYS |           |        |        |        |         |
|--------------------------------|-----------|------------|-------------|-----------|-------------------|-----------------------------|-----------|--------|--------|--------|---------|
| Lanes                          | Median    | Left Lanes | Right Lanes | Exclusion | Adjustment Factor | Lanes                       | Median    | B      | C      | D      | E       |
| 2                              | Divided   | Yes        | No          | No        | +5%               | 2                           | Undivided | 8,600  | 17,000 | 24,200 | 33,300  |
| 2                              | Undivided | No         | No          | No        | -20%              | 4                           | Divided   | 36,700 | 51,800 | 65,600 | 72,600  |
| Multi                          | Undivided | Yes        | No          | No        | -5%               | 6                           | Divided   | 55,000 | 77,700 | 98,300 | 108,800 |
| Multi                          | Undivided | No         | No          | No        | -25%              |                             |           |        |        |        |         |
| -                              | -         | -          | Yes         | Yes       | +5%               |                             |           |        |        |        |         |

| One-Way Facility Adjustment                                             |           |     |     |     |      |
|-------------------------------------------------------------------------|-----------|-----|-----|-----|------|
| Multiply the corresponding raw-directional volumes in this table by 0.6 |           |     |     |     |      |
| 2                                                                       | Divided   | Yes | No  | No  | +5%  |
| 2                                                                       | Undivided | No  | No  | No  | -20% |
| Multi                                                                   | Undivided | Yes | No  | No  | -5%  |
| Multi                                                                   | Undivided | No  | No  | No  | -25% |
| -                                                                       | -         | -   | Yes | Yes | +5%  |

| 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 | 2-3 | 2-2 | 2-1 |  |

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

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

| INTERRUPTED FLOW FACILITIES                                                                                                                                           |           |            |             |                   |        | UNINTERRUPTED FLOW FACILITIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |                     |                   |         |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|-------------|-------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------|-------------------|---------|---------|
| <b>STATE SIGNALIZED ARTERIALS</b>                                                                                                                                     |           |            |             |                   |        | <b>FREEWAYS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |                     |                   |         |         |
| 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    | 97,200              | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 44,800    | 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<br>(After corresponding non-volume by the indicated percent.)                                                                |           |            |             |                   |        | Freeway Adjustments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |                     |                   |         |         |
| Non-State Signalized Roadways: -10%                                                                                                                                   |           |            |             |                   |        | Auxiliary Lane: Empty Metering +5%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |                     |                   |         |         |
| Median & Turn Lane Adjustments                                                                                                                                        |           |            |             |                   |        | Uninterrupted Flow Highway's                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |                     |                   |         |         |
| Lanes                                                                                                                                                                 | Median    | Left Lanes | Right Lanes | Adjustment Factor |        | 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   | 36,700              | 51,800            | 63,600  | 72,600  |
| Multi                                                                                                                                                                 | Undivided | Yes        | No          | -5%               |        | Multi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Undivided | 55,000              | 77,700            | 98,300  | 108,800 |
| Multi                                                                                                                                                                 | Undivided | No         | No          | -25%              |        | Uninterrupted Flow Highway Adjustments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |           |                     |                   |         |         |
| -                                                                                                                                                                     | -         | -          | Yes         | +5%               |        | Lanes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Median    | Exclusive left lane | Adjustment Factor |         |         |
| One-Way Facility Adjustment<br>Multiply the corresponding non-directional volumes in this table by 0.6                                                                |           |            |             |                   |        | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Divided   | Yes                 | +5%               |         |         |
| BICYCLE MODE <sup>2</sup><br>(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)    |           |            |             |                   |        | Multi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Undivided | No                  | -25%              |         |         |
| Shoulder/Bicycle Lane Coverage                                                                                                                                        |           |            |             |                   |        | * Values shown are presented as two-way annual average daily volumes for levels of service and are for the amount of peak volume specifically noted. This table does not consider a modified and shared road study 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 devices, where more refined inclusion rules, calculations and level of planning specifications of the highway, degree of demand and the amount, grade and quality of service volume. |           |                     |                   |         |         |
| 0-49%                                                                                                                                                                 | *         | 2,900      | 7,600       | 19,700            |        | † 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 use in the facility.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |                     |                   |         |         |
| 50-84%                                                                                                                                                                | 2,100     | 6,700      | 19,700      | 19,700            |        | ‡ Buses per lane hours are only for the peak hour in the single direction of the highest traffic flow.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |           |                     |                   |         |         |
| 85-100%                                                                                                                                                               | 9,300     | 19,700     | -19,700     | **                |        | * Cautions to be observed when table input value defaults.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                     |                   |         |         |
| PEDESTRIAN MODE <sup>2</sup><br>(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.) |           |            |             |                   |        | ** Not applicable for the level of service lower grade. For the non-motorist mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |                     |                   |         |         |
| Sidewalk Coverage                                                                                                                                                     | B         | C          | D           | E                 |        | †† Values greater than level of service D because of freeway interchanges are not shown. For the bicycle mode, 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.                                                                                                                                                                                                                                                                                                                                                   |           |                     |                   |         |         |
| 0-49%                                                                                                                                                                 | *         | *          | 2,800       | 9,500             |        | Source: Florida Department of Transportation, Division Planning Office, <a href="http://www.dot.state.fl.us/transportation/plan/defn/defn.html">www.dot.state.fl.us/transportation/plan/defn/defn.html</a>                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                     |                   |         |         |
| 50-84%                                                                                                                                                                | *         | 1,600      | 8,700       | 15,800            |        | 2012 FOOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |                     |                   |         |         |
| 85-100%                                                                                                                                                               | 3,800     | 10,700     | 17,400      | >19,700           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |                     |                   |         |         |
| BUS MODE (Scheduled Fixed Route) <sup>3</sup><br>(Buses in peak hour in peak direction)                                                                               |           |            |             |                   |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |                     |                   |         |         |
| Sidewalk Coverage                                                                                                                                                     | B         | C          | D           | E                 |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |                     |                   |         |         |
| 0-84%                                                                                                                                                                 | > 4       | -1         | -3          | -1                |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |                     |                   |         |         |
| 85-100%                                                                                                                                                               | > 4       | 2-3        | 2-2         | 2-1               |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |                     |                   |         |         |

# 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 Ramp                                                                                                                                                                                                                                                                                                                                                                       |           |                      |                    |         |         |              |  |  |  |  |  |
| Non-State Signalized Roadways: -10%                                                                                               |           |                      |                       |                    |   | Present in Both Directions: +20.00%                                                                                                                                                                                                                                                                                                                                                       |           |                      |                    |         |         | Merging: +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   | 25,000               | 77,700             | 98,300  | 108,800 |              |  |  |  |  |  |
| Multi                                                                                                                             | Undivided | No                   | No                    | -25%               |   |                                                                                                                                                                                                                                                                                                                                                                                           |           |                      |                    |         |         |              |  |  |  |  |  |
|                                                                                                                                   |           |                      | Yes                   | -5%                |   | Uninterrupted Flow Highway Adjustment                                                                                                                                                                                                                                                                                                                                                     |           |                      |                    |         |         |              |  |  |  |  |  |
| One-Way Facility Adjustment                                                                                                       |           |                      |                       |                    |   | Lanes                                                                                                                                                                                                                                                                                                                                                                                     | Median    | Exclusive left lanes | Adjustment factors |         |         |              |  |  |  |  |  |
| Multiply the corresponding two-discussion volumes in this table by 0.6                                                            |           |                      |                       |                    |   | 2                                                                                                                                                                                                                                                                                                                                                                                         | Divided   | Yes                  | -5%                |         |         |              |  |  |  |  |  |
|                                                                                                                                   |           |                      |                       |                    |   | Multi                                                                                                                                                                                                                                                                                                                                                                                     | Undivided | Yes                  | -5%                |         |         |              |  |  |  |  |  |
|                                                                                                                                   |           |                      |                       |                    |   | Multi                                                                                                                                                                                                                                                                                                                                                                                     | Undivided | No                   | -25%               |         |         |              |  |  |  |  |  |
| BICYCLE MODE <sup>1</sup>                                                                                                         |           |                      |                       |                    |   | * Values shown are presented as two-way annual average daily volumes for levels of service and not for the uninterrupted median volume (uninterrupted road). This table does not contain a standard and should be used only for planning purposes.                                                                                                                                        |           |                      |                    |         |         |              |  |  |  |  |  |
| Multiply maximum vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes. |           |                      |                       |                    |   | The computer model from which this table is derived should be used for more specific planning applications. This table and associated computer models should not be used for analysis of intersection details, where more detailed analyses 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                                                                                              |           |                      |                       |                    |   | * Level of service for the bicycle and pedestrian modes in this table is based on number of unimpaired vehicles, not number of vehicles or pedestrian, using the facility.                                                                                                                                                                                                                |           |                      |                    |         |         |              |  |  |  |  |  |
| Lane Coverage                                                                                                                     | B         | C                    | D                     | E                  |   | * Some peak hours may only be for peak hour in the single direction of the higher traffic flow.                                                                                                                                                                                                                                                                                           |           |                      |                    |         |         |              |  |  |  |  |  |
| 0-49%                                                                                                                             | * 2,900   | 7,600                | 19,700                |                    |   | * Values are not intended to be used as design values.                                                                                                                                                                                                                                                                                                                                    |           |                      |                    |         |         |              |  |  |  |  |  |
| 50-84%                                                                                                                            | 2,100     | 6,700                | 19,700                | -19,700            |   | ** Not applicable for the level of service being grade. For the research needs, volume greater than level of service D because intersection capacity has been exceeded. For the bicycle mode, the level of service (see table PT) is not applicable because there is no maximum vehicle volume threshold on any table input value definition.                                             |           |                      |                    |         |         |              |  |  |  |  |  |
| 85-100%                                                                                                                           | 9,200     | 19,700               | 19,700                | **                 |   | Source: Florida Department of Transportation, Florida Planning Office, <a href="http://www.dot.state.fl.us/planning/tables/tables.htm">www.dot.state.fl.us/planning/tables/tables.htm</a>                                                                                                                                                                                                 |           |                      |                    |         |         |              |  |  |  |  |  |
| PEDESTRIAN MODE <sup>1</sup>                                                                                                      |           |                      |                       |                    |   | 2012 FDOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES                                                                                                                                                                                                                                                                                                                                        |           |                      |                    |         |         |              |  |  |  |  |  |
| Multiply maximum vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes. |           |                      |                       |                    |   |                                                                                                                                                                                                                                                                                                                                                                                           |           |                      |                    |         |         |              |  |  |  |  |  |
| Sidewalk Coverage                                                                                                                 |           |                      |                       |                    |   |                                                                                                                                                                                                                                                                                                                                                                                           |           |                      |                    |         |         |              |  |  |  |  |  |
| Lane Coverage                                                                                                                     | B         | C                    | D                     | E                  |   |                                                                                                                                                                                                                                                                                                                                                                                           |           |                      |                    |         |         |              |  |  |  |  |  |
| 0-49%                                                                                                                             | * 2,800   | 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) <sup>3</sup>                                                                                     |           |                      |                       |                    |   |                                                                                                                                                                                                                                                                                                                                                                                           |           |                      |                    |         |         |              |  |  |  |  |  |
| (Buses in peak hour in peak direction)                                                                                            |           |                      |                       |                    |   |                                                                                                                                                                                                                                                                                                                                                                                           |           |                      |                    |         |         |              |  |  |  |  |  |
| Sidewalk Coverage                                                                                                                 |           |                      |                       |                    |   |                                                                                                                                                                                                                                                                                                                                                                                           |           |                      |                    |         |         |              |  |  |  |  |  |
| Lane Coverage                                                                                                                     | B         | C                    | D                     | E                  |   |                                                                                                                                                                                                                                                                                                                                                                                           |           |                      |                    |         |         |              |  |  |  |  |  |
| 0-84%                                                                                                                             | > 5       | ≥ 4                  | ≥ 3                   | ≥ 2                |   |                                                                                                                                                                                                                                                                                                                                                                                           |           |                      |                    |         |         |              |  |  |  |  |  |
| 85-100%                                                                                                                           | > 4       | ≥ 3                  | ≥ 2                   | ≥ 1                |   |                                                                                                                                                                                                                                                                                                                                                                                           |           |                      |                    |         |         |              |  |  |  |  |  |

| <b>BUS MODE (Scheduled Fixed Route)<sup>3</sup></b> |     |     |     |     |
|-----------------------------------------------------|-----|-----|-----|-----|
| <b>(Buses in peak hour in peak direction)</b>       |     |     |     |     |
| 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 unit 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                                     |                            |         |           |         |         |
|                                                                         |           |            |             |         |                                        |                            |         |           |         |         |

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

| Sidewalk Coverage | B |       |        |        |
|-------------------|---|-------|--------|--------|
|                   | C | D     | E      |        |
| 0-49%             | * | *     | 2,800  | 9,400  |
| 50-84%            | * | 1,600 | 8,600  | 13,600 |
| 85-100%           | * | 3,800 | 10,500 | 17,100 |

**BUS MODE (Scheduled Fixed Route)<sup>4</sup>**  
(Does not peak hour to 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, Division Planning Office, www.fdot.state.fl.us/transportation/planning/traffic/tables.htm

| 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> 12/18/12

| 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 Metering |                      |                    |         |         |
| 4                                                                       | Divided   | *                    | 9,900                 | 28,800             | 31,600                                                                                                                              | -20.00%                             |                      |                    |         |         |
| 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 area and should be used only for general planning purposes. The unshaded areas from which this table is derived should be used for more specific planning applications. The table and design criteria models should be used for roadway performance design, when approved by the state transportation agency. The table and design criteria models should be used for roadway performance design, when approved by the state transportation agency.

<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 top vehicle data.

<sup>5</sup> Not applicable to the dual-lane of service level grade. For the non-urbanized areas, the lowest service level level of service is D because of the lower service level grade. For the urbanized areas, the lowest service level level of service is D because of the lower service level grade. For the urbanized areas, the lowest service level level of service is D because of the lower service level grade.

Source: Florida Department of Transportation, Florida Planning Office, <http://www.floridadot.com/plan/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 |



# 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

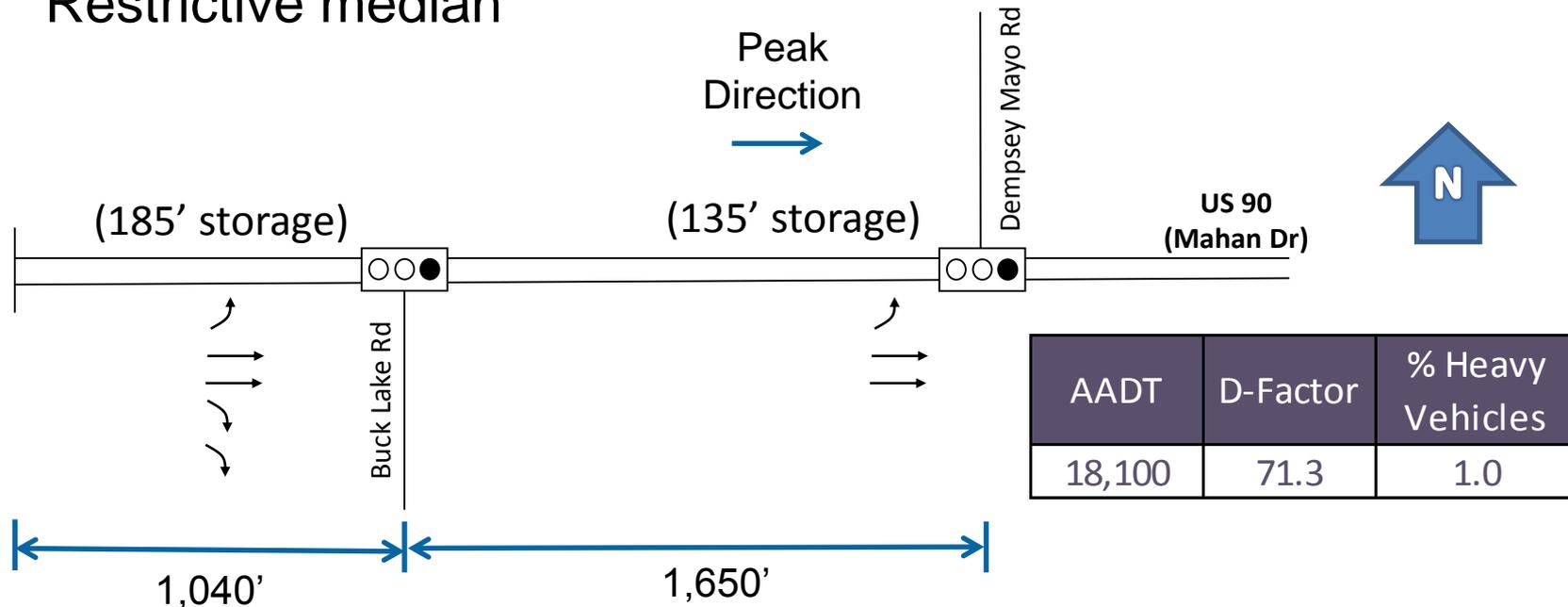
| AADT  | D-Factor | % Heavy Vehicles | Local Adjustment Factor |
|-------|----------|------------------|-------------------------|
| 5,056 | 55.8     | 12.0             | 0.76                    |

# ARTPLAN

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

Mahan Drive and Dempsey Mayo Road, Tallahassee

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

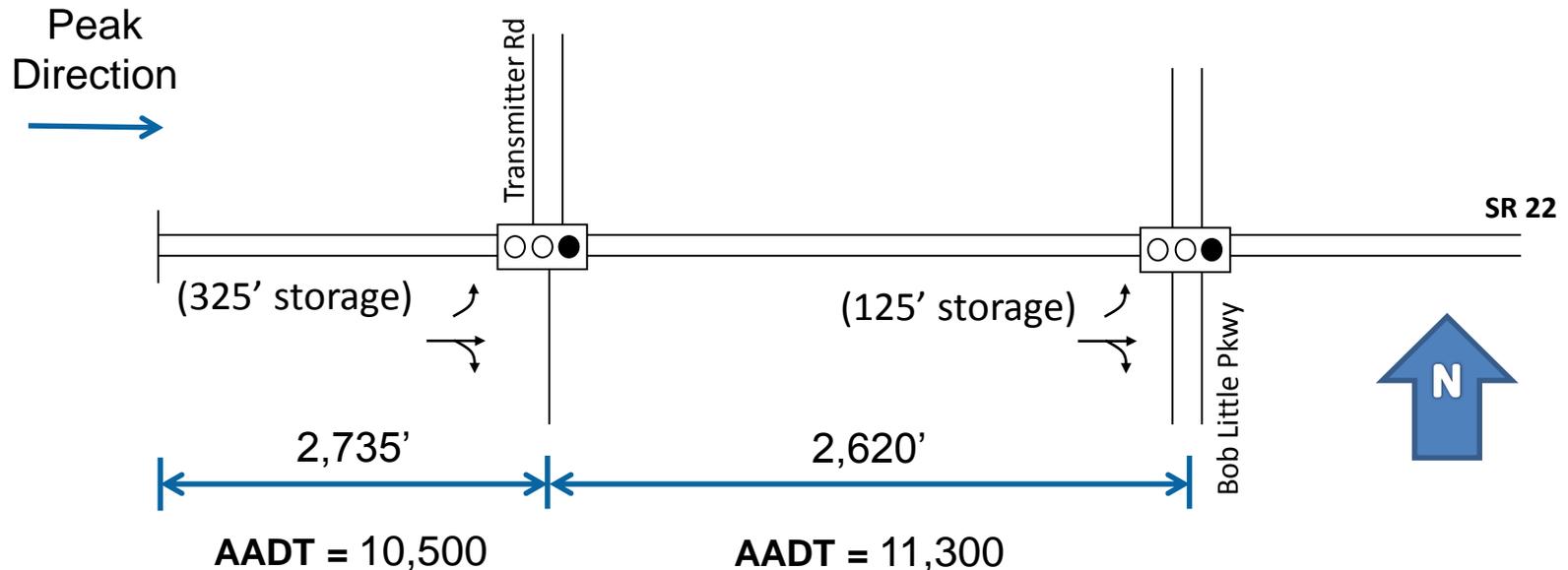


# ARTPLAN

## 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



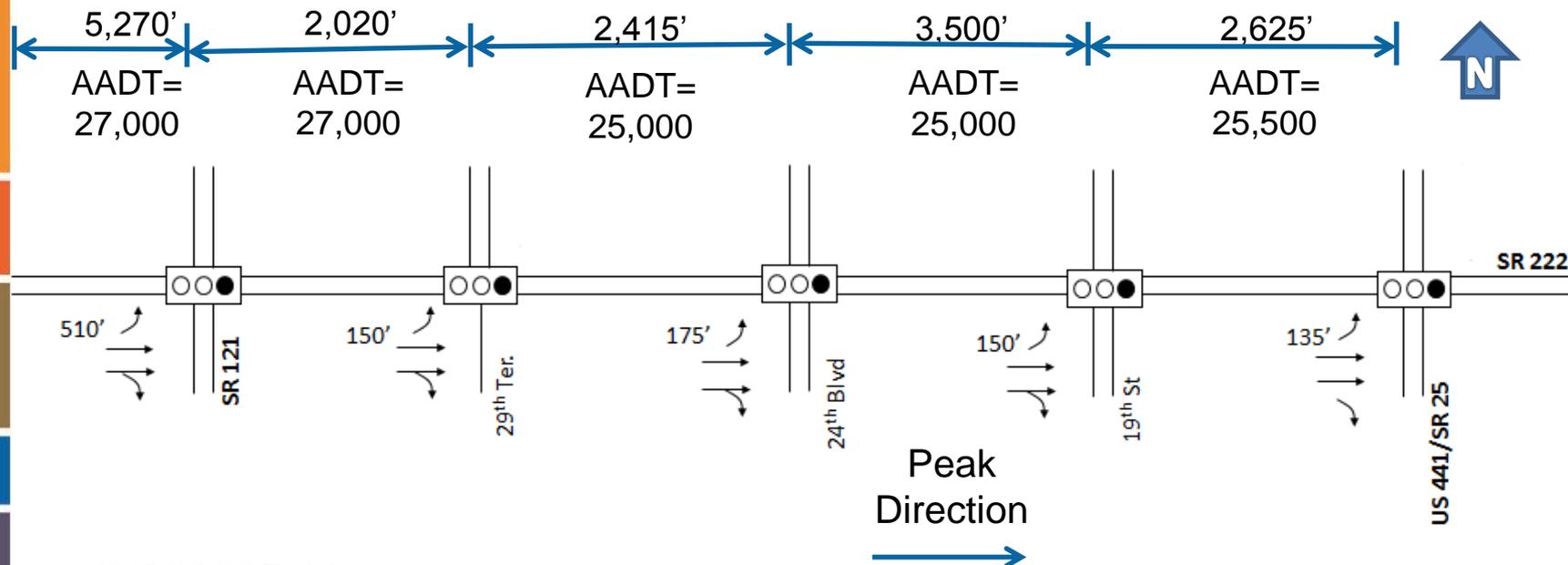
# ARTPLAN

## 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 |
|------------------------|--------------|---------------|
| SR 121                 | 12           | 12            |
| 29 <sup>th</sup> Terr. | 5            | 5             |
| 24 <sup>th</sup> Blvd. | 5            | 5             |
| 19 <sup>th</sup> St.   | 5            | 5             |
| US 441                 | 10           | 12            |



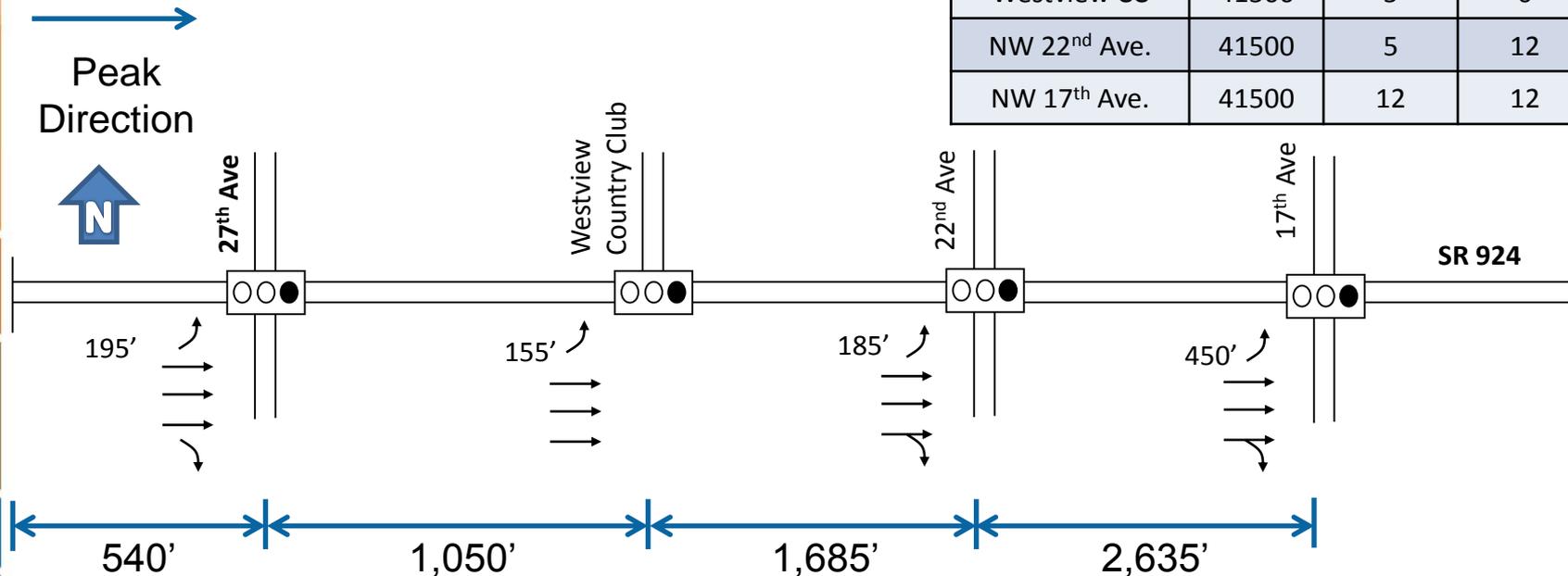
# ARTPLAN

## 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 |
|--------------------------|-------|--------------|---------------|
| NW 27 <sup>th</sup> Ave. | 41500 | 8            | 12            |
| Westview CC              | 41500 | 5            | 0             |
| NW 22 <sup>nd</sup> Ave. | 41500 | 5            | 12            |
| NW 17 <sup>th</sup> Ave. | 41500 | 12           | 12            |



# 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?

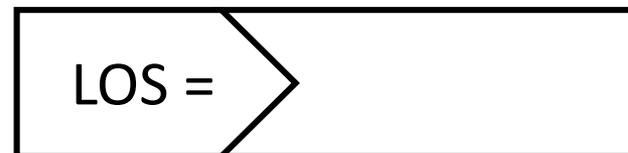
|       |
|-------|
| LOS = |
|-------|

# 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?

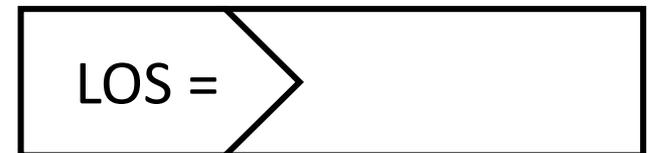


# ARTPLAN

## **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?

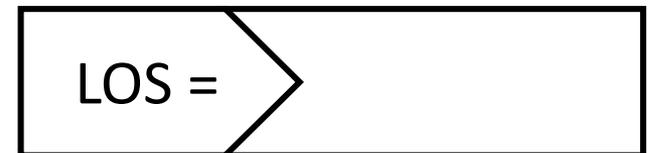


# ARTPLAN

## **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?

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~~

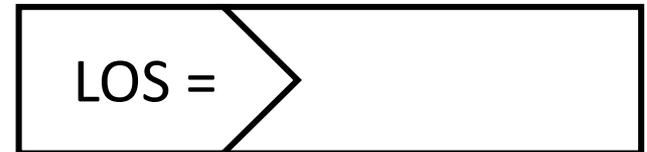
What is the pedestrian LOS if a sidewalk with typical separation were added to the whole facility?

|       |
|-------|
| LOS = |
|-------|

# 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?

|         |   |
|---------|---|
| 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%            | Good           |
| Second | Third    | 2                          | No                    | 60%            | Fair           |
| Third  | Mulberry | 1                          | No                    | 75%            | Poor           |

|       |   |
|-------|---|
| LOS = | ▶ |
|-------|---|

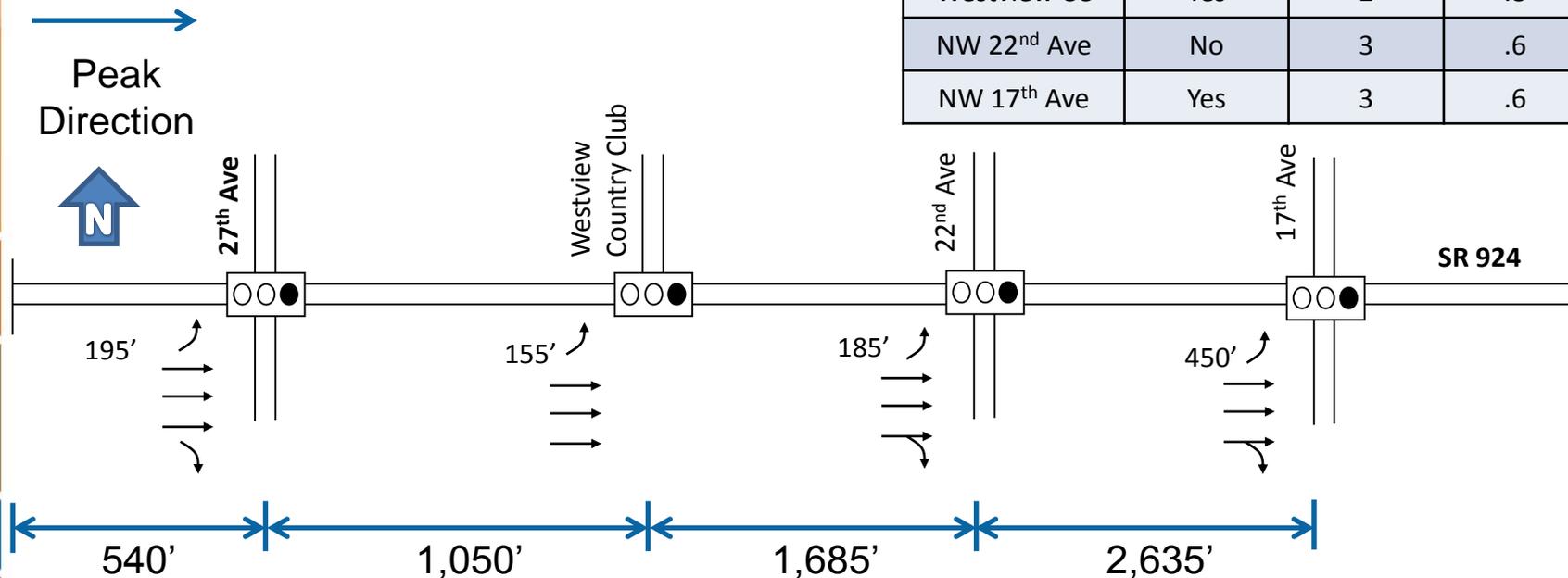
# ARTPLAN

## 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          |

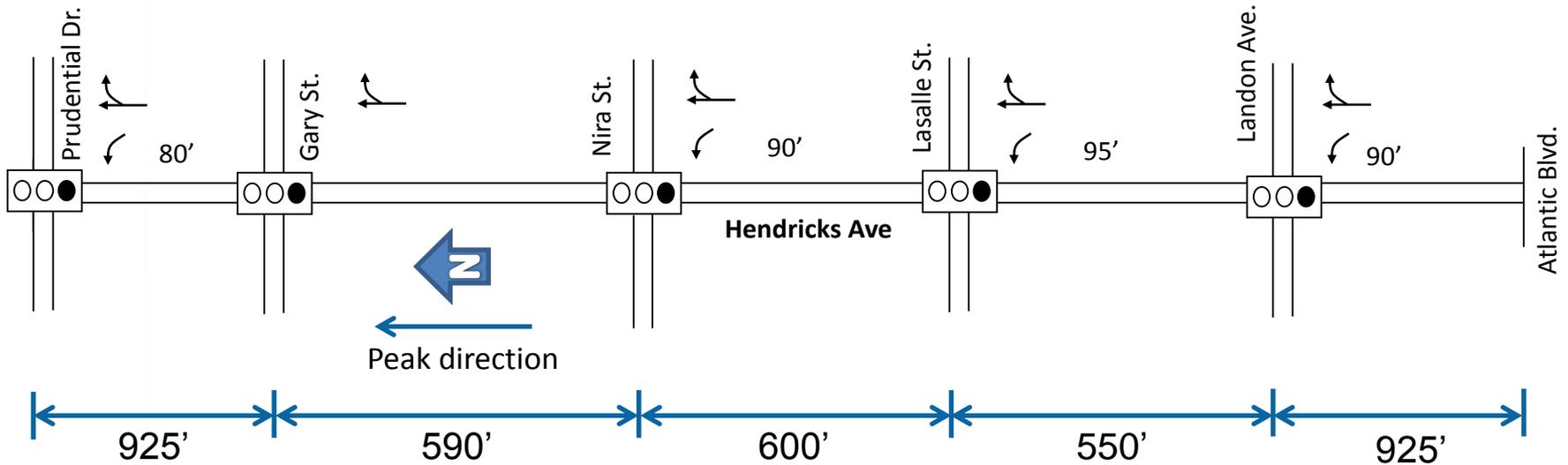


# ARTPLAN

## Local Workshop *Known Inputs & Multimodal Analysis*

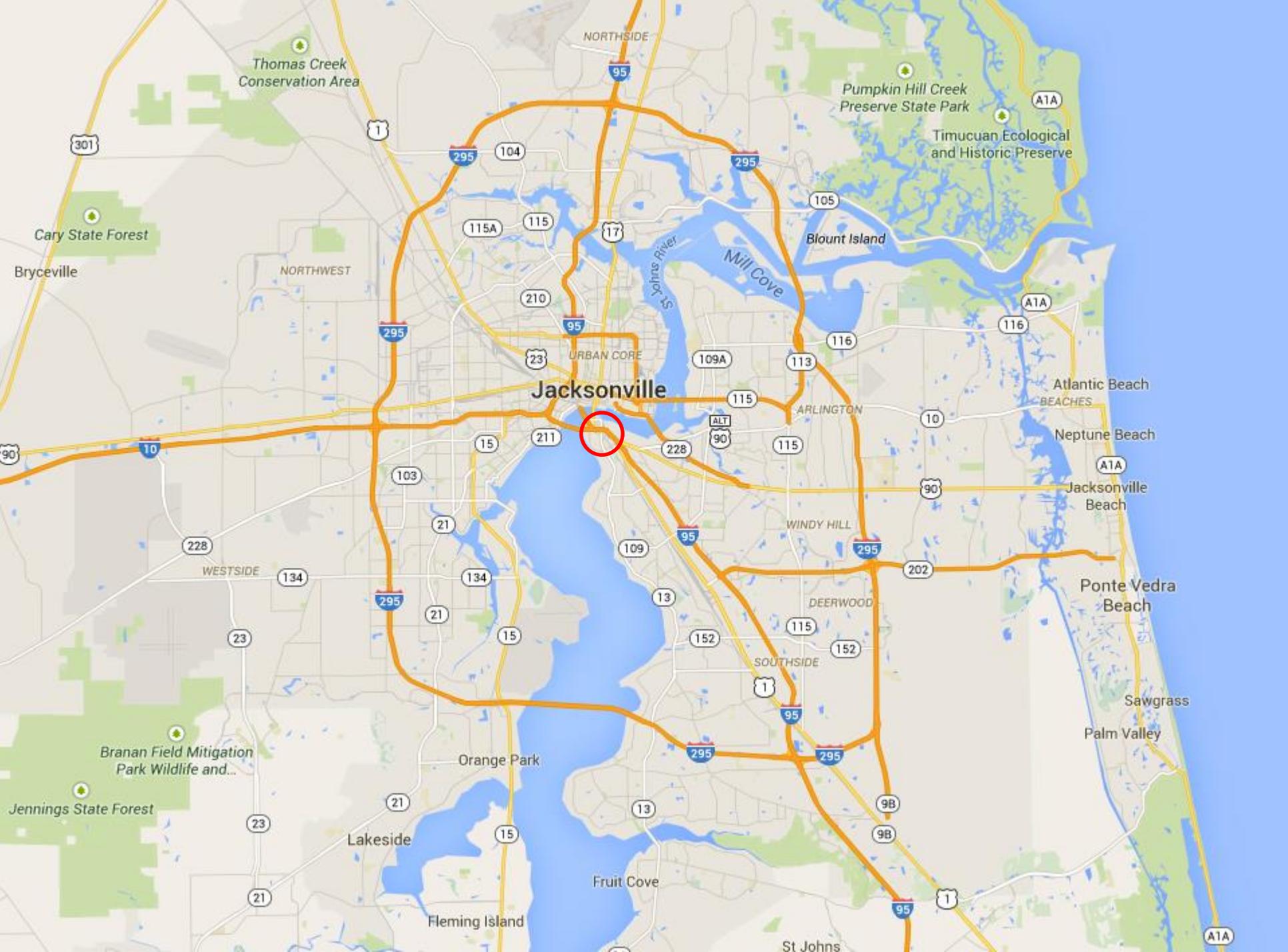
Hendricks Ave. between Prudential Dr. & Atlantic Blvd. Jacksonville, FL

Class 2 – Large Urbanized.



D-Factor: 57.1  
% Hvy Vchls: 0.7

| Segment        | AADT  | Sidewalks | % Left Turns | % Right Turns |
|----------------|-------|-----------|--------------|---------------|
| Landon Ave.    | 18700 | Adjacent  | 12           | 12            |
| Lasalle St.    | 18700 | Adjacent  | 12           | 12            |
| Nira St.       | 18700 | Adjacent  | 12           | 12            |
| Gary St.       | 18700 | Adjacent  | 0            | 12            |
| Prudential Dr. | 18700 | Adjacent  | 12           | 12            |



# Jacksonville

NORTHSIDE

Thomas Creek  
Conservation Area

Pumpkin Hill Creek  
Preserve State Park

Timucuan Ecological  
and Historic Preserve

Cary State Forest

Blount Island

NORTHWEST

URBAN CORE

ARLINGTON

Atlantic Beach  
BEACHES

Neptune Beach

Jacksonville  
Beach

WINDY HILL

Ponte Vedra  
Beach

WESTSIDE

DEERWOOD

Sawgrass

Palm Valley

Branan Field Mitigation  
Park Wildlife and...

Orange Park

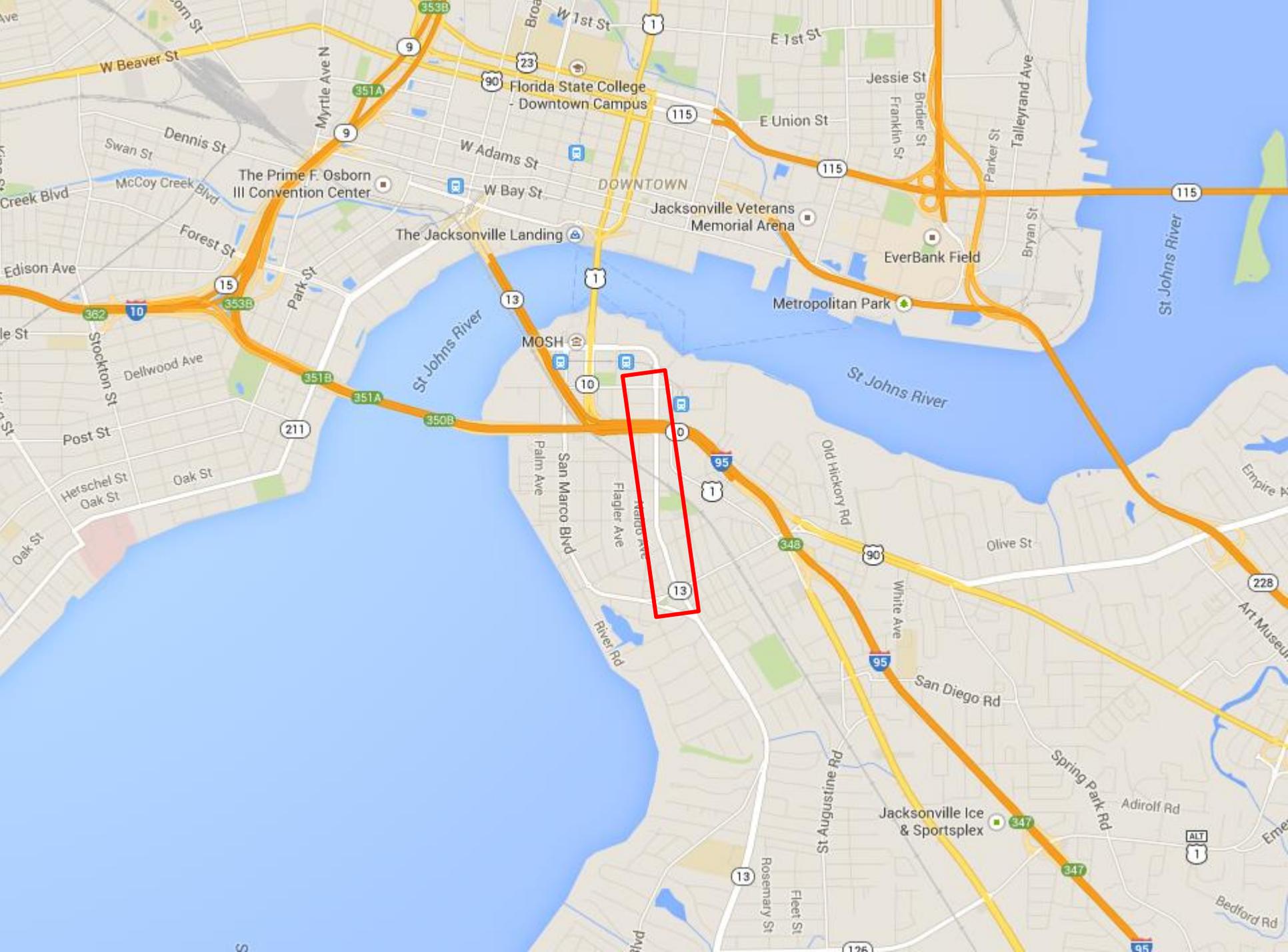
Lakeside

Fruit Cove

Fleming Island

St Johns

Jennings State Forest



St Johns River

St Johns River

St Johns River

MOSH

San Marco Blvd  
Palm Ave

Flagler Ave

Old Hickory Rd

San Diego Rd

Jacksonville Ice & Sportsplex

Florida State College  
- Downtown Campus

Jacksonville Veterans  
Memorial Arena

EverBank Field

The Prime F. Osborn  
III Convention Center

The Jacksonville Landing

Metropolitan Park

DOWNTOWN

Art Museum

Jacksonville Ice & Sportsplex

St Johns River

St Johns River

St Johns River

MOSH

San Marco Blvd  
Palm Ave

Flagler Ave

Old Hickory Rd

San Diego Rd

Jacksonville Ice & Sportsplex

Florida State College  
- Downtown Campus

Jacksonville Veterans  
Memorial Arena

EverBank Field

The Prime F. Osborn  
III Convention Center

The Jacksonville Landing

Metropolitan Park

DOWNTOWN

Art Museum

Jacksonville Ice & Sportsplex

Protected+Permissive  
Left Turn Signals

Non-Restrictive



No transit  
Bike lanes  
Sidewalks – adjacent separation

On-Street Parking





# FREEPLAN

## Example 1

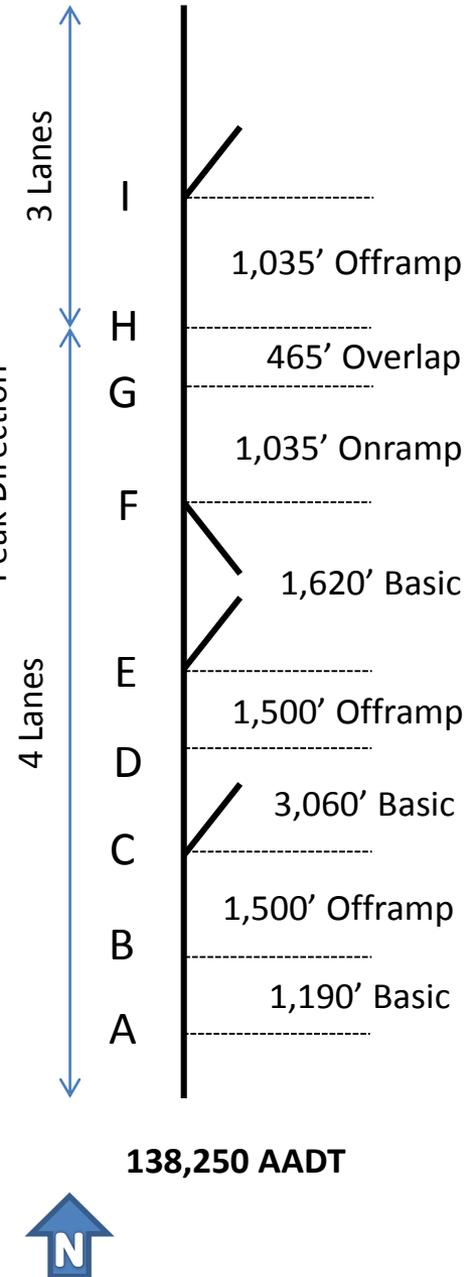
*Basic/Ramps/Ramp Overlap*

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

- Large urbanized area type
- Core freeway – K-factor of 8.0 ( $K_{\text{other}}$ )
- 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

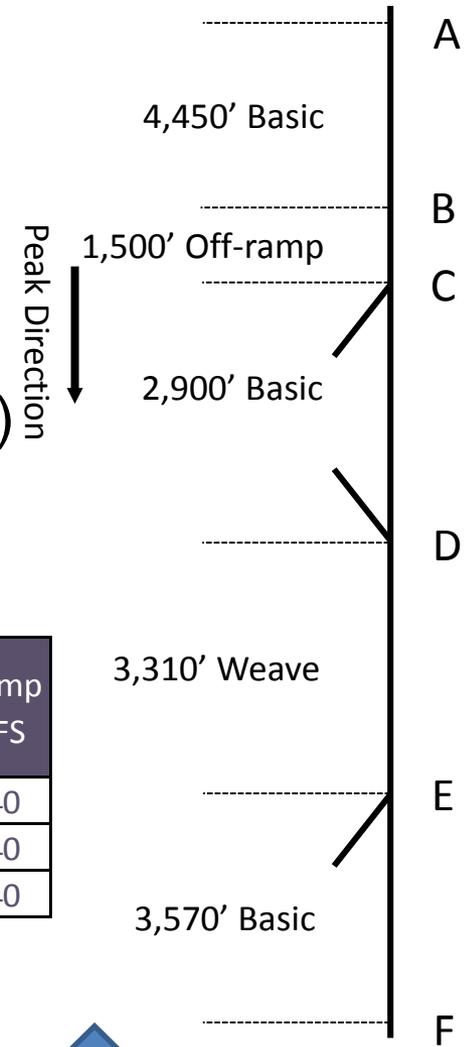
75,000 AADT

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%)



Show Aerial of I-4

| 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

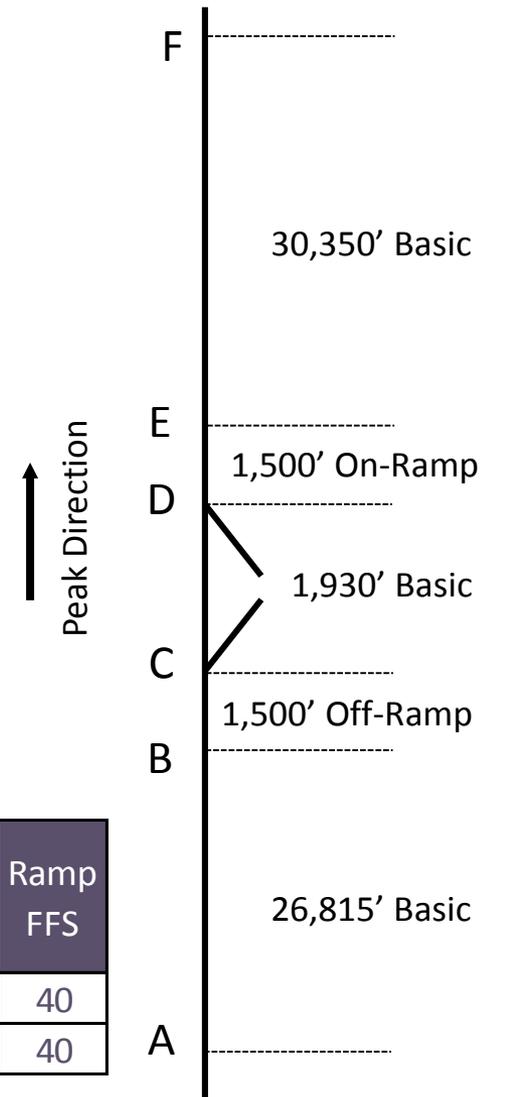
## Workshop 2 Basic/Ramps

*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

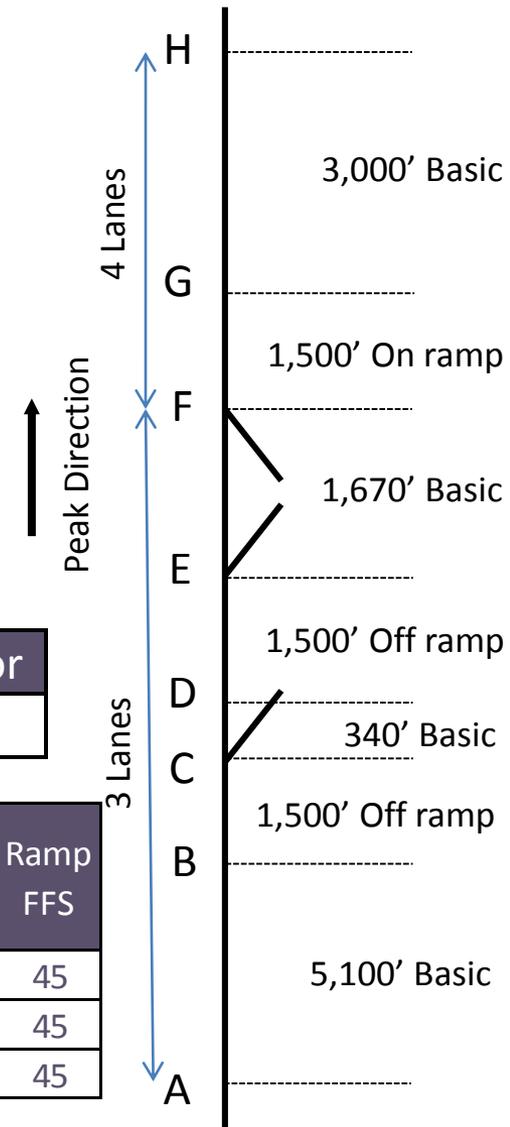
## Workshop 3 Basic/Ramps

*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       |





# 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       |

