2015

Quality/Level of Service Training

Planning Level Analysis

Problem Set

March 2015

Centennial FDOT 1915 ★ 2015

Data Sources Example Problem

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

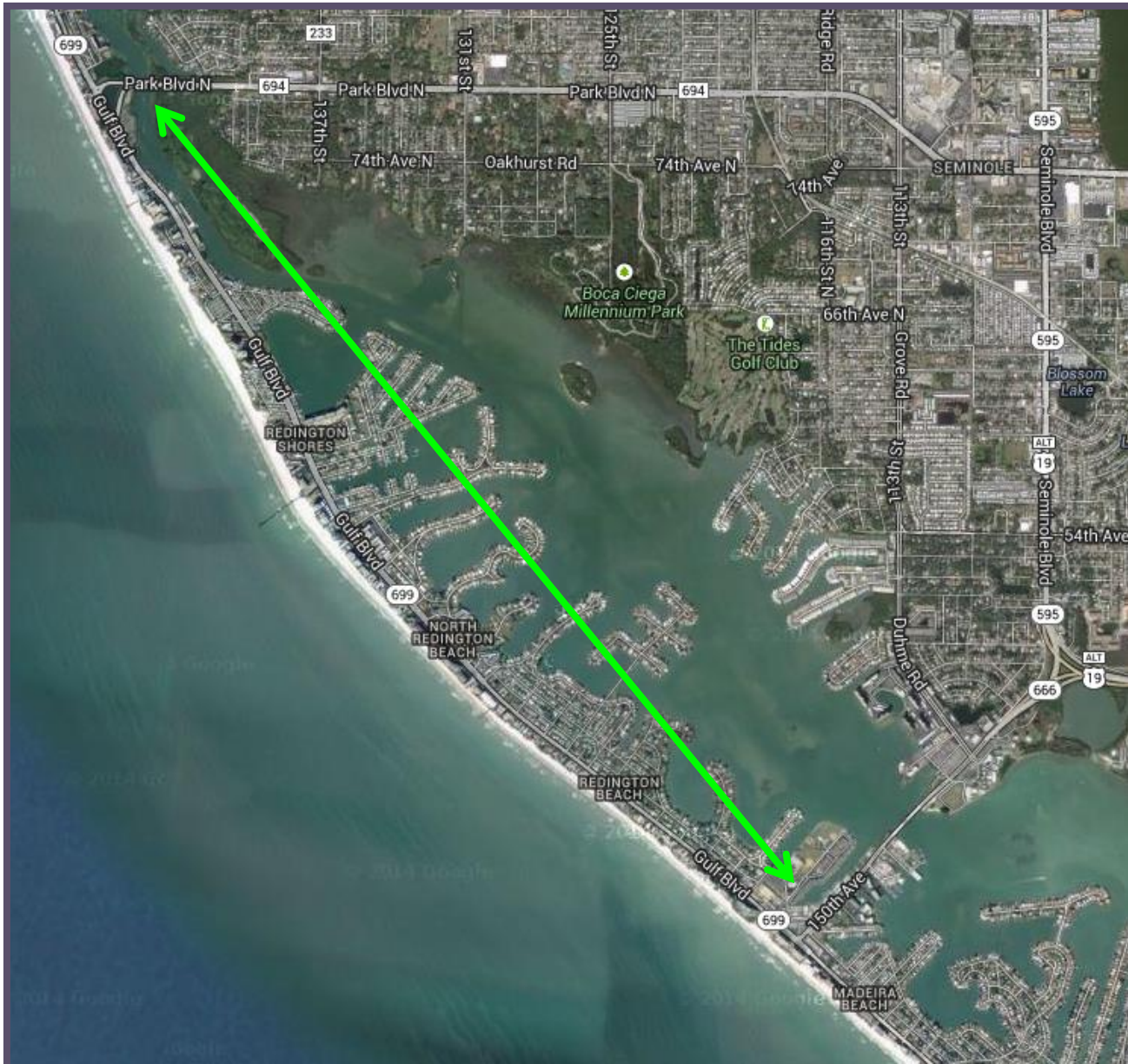
Data Sources Workshop Problem

SR 699

- Between Park Blvd and SR 666
- Redington Beach (D7)

Identify:

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



Data Sources Workshop Problem

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

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

GSVT Example 2.A

Determine the auto LOS:

- In terms of peak hour directional volumes
- In an undeveloped rural area
- For an uninterrupted flow highway with
  - 2 lanes (one in each direction)
  - No median/undivided
  - No passing lanes
  - Peak hour directional volume is 440

GSVT Example 2.B

Determine the auto LOS:

- In terms of peak hour directional volumes
- In an undeveloped rural area
- For an uninterrupted flow highway with
  - 2 lanes (one in each direction)
  - 20% passing lane
  - No median/undivided
  - Peak hour directional volume is 440

GSVT Example 3

Determine the auto LOS:

- In terms of peak hour directional volumes
- In an urban 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

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

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

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

GSVT Example 5

Determine the auto LOS:

- In terms of AADT
- In an urban area (pop. 12,000)
- For an undivided state arterial with
  - 30 mph speed limit
  - 2 lanes
  - 6,000 AADT

GSVT Example 6

Determine the auto LOS:

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

GSVT Example 7

Determine the max. service volume for LOS E:

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

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 *Two-Lane Segment*

SR 20 between Bloxham Cutoff & Geddie Rd, Tallahassee

- Transitioning/Urban area type
- WB peak direction
- 55 mph posted speed limit
- 14.5 mile segment
- 62% no passing zones
- No median

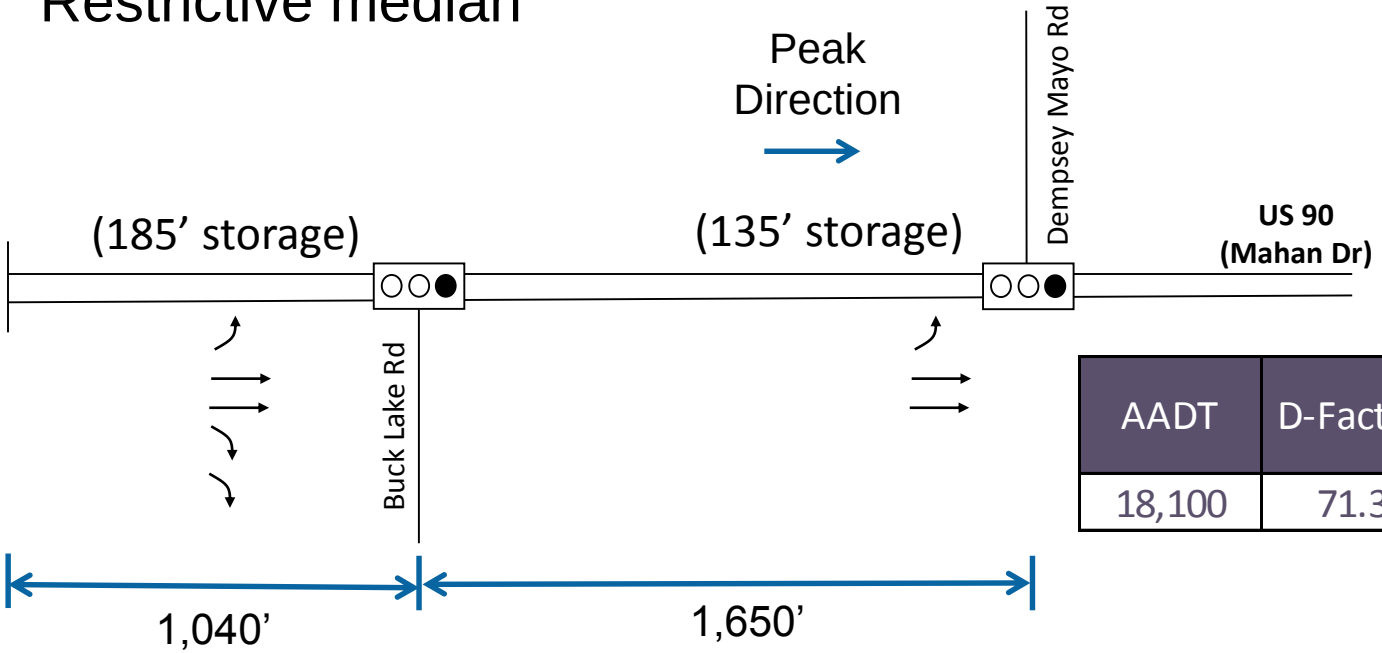
AADT	D-Factor	% Heavy Vehicles	Local Adjustment Factor
5,931	78.7	4.0	0.91

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



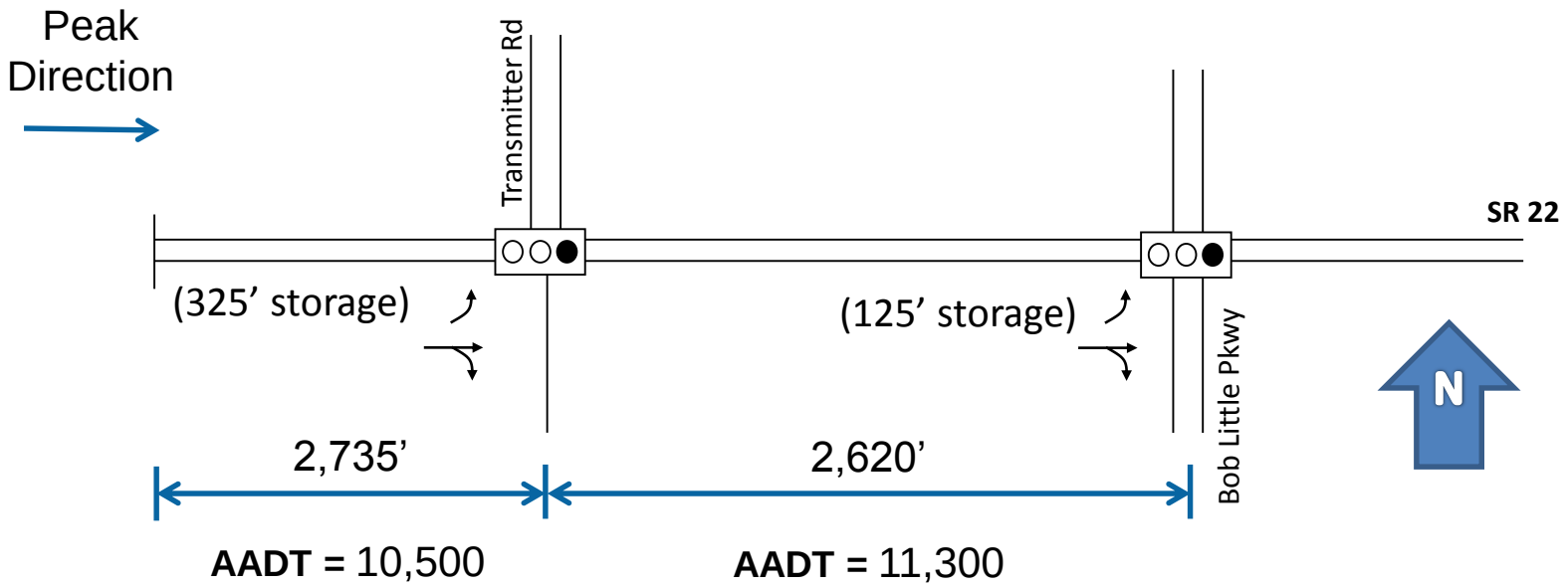
AADT	D-Factor	% Heavy Vehicles
18,100	71.3	1.0

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



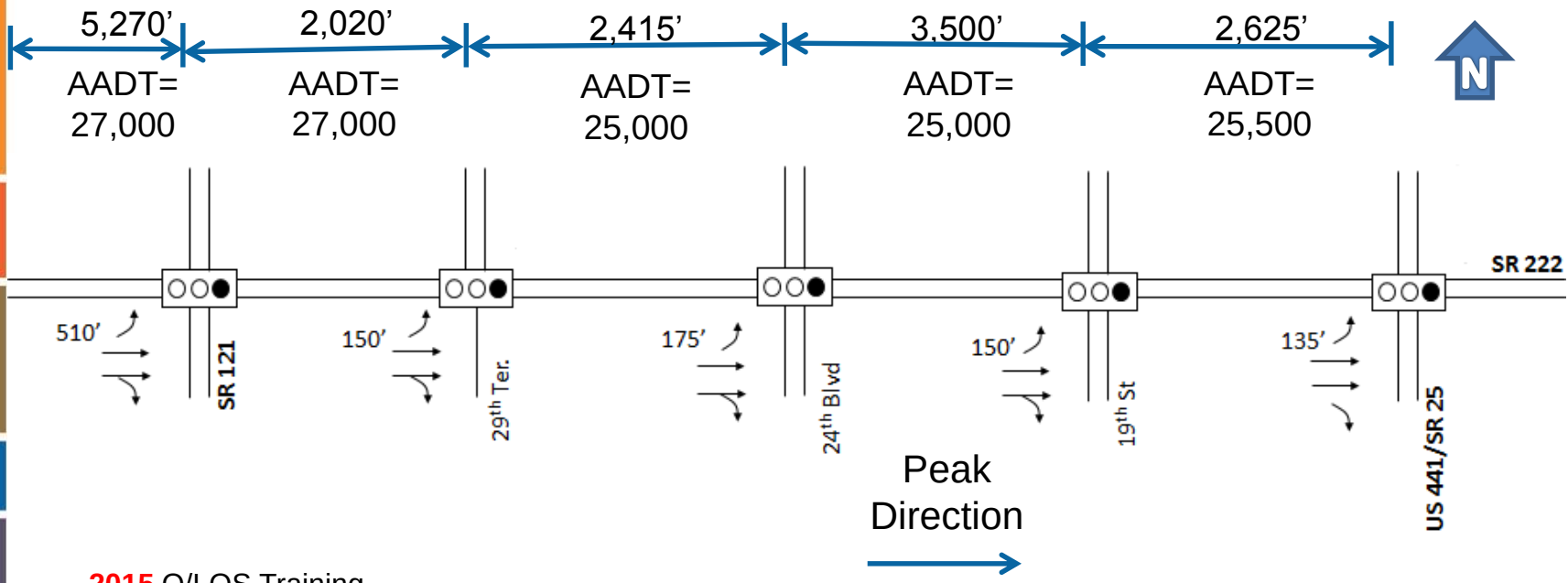
ARTPLAN

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
29th Terr	5	5
24th Blvd	5	5
19th St	5	5
US 441	10	12



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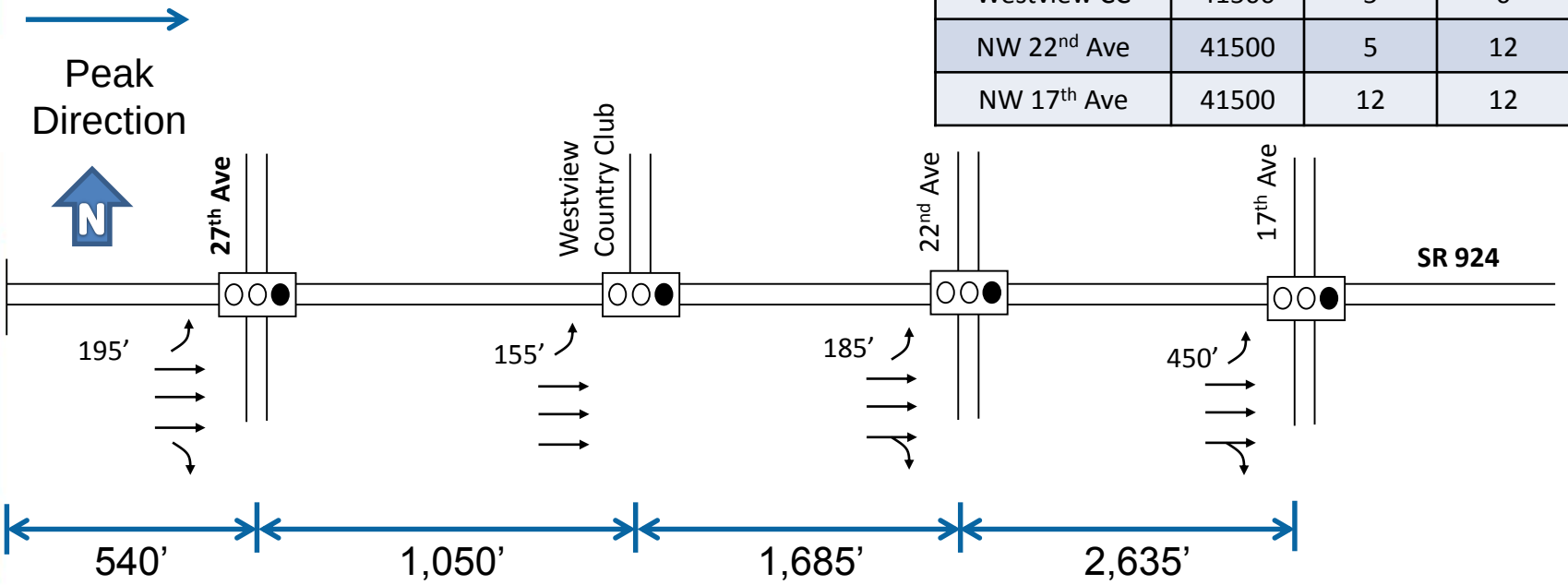
Workshop #3 *Known Inputs & Multimodal Analysis*

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

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

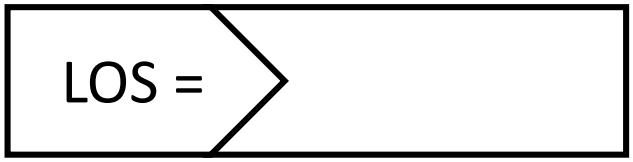
Segment	AADT	% Left Turns	% Right Turns
NW 27th Ave	41500	8	12
Westview CC	41500	5	0
NW 22nd Ave	41500	5	12
NW 17th Ave	41500	12	12



ARTPLAN

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

- Area type: Large Urbanized
- Opening 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

Bus Workshop #1.A *Known Inputs & Multimodal Analysis*

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

From	To	Buses/Hr in peak direction	Existence of Sidewalk	Passenger Load	Stop Amenities
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 =

LOS =

LOS =

LOS =

LOS =

ARTPLAN

Bus Workshop #1.B *Known Inputs & Multimodal Analysis*

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

From	To	Buses/Hr in peak direction	Existence of Sidewalk	Passenger Load	Stop Amenities
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 =

LOS =

LOS =

LOS =

LOS =

ARTPLAN

Bus Workshop #1.C *Known Inputs & Multimodal Analysis*

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

From	To	Buses/Hr in peak direction	Existence of Sidewalk	Passenger Load	Stop Amenities
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 =

LOS =

LOS =

LOS =

LOS =

ARTPLAN

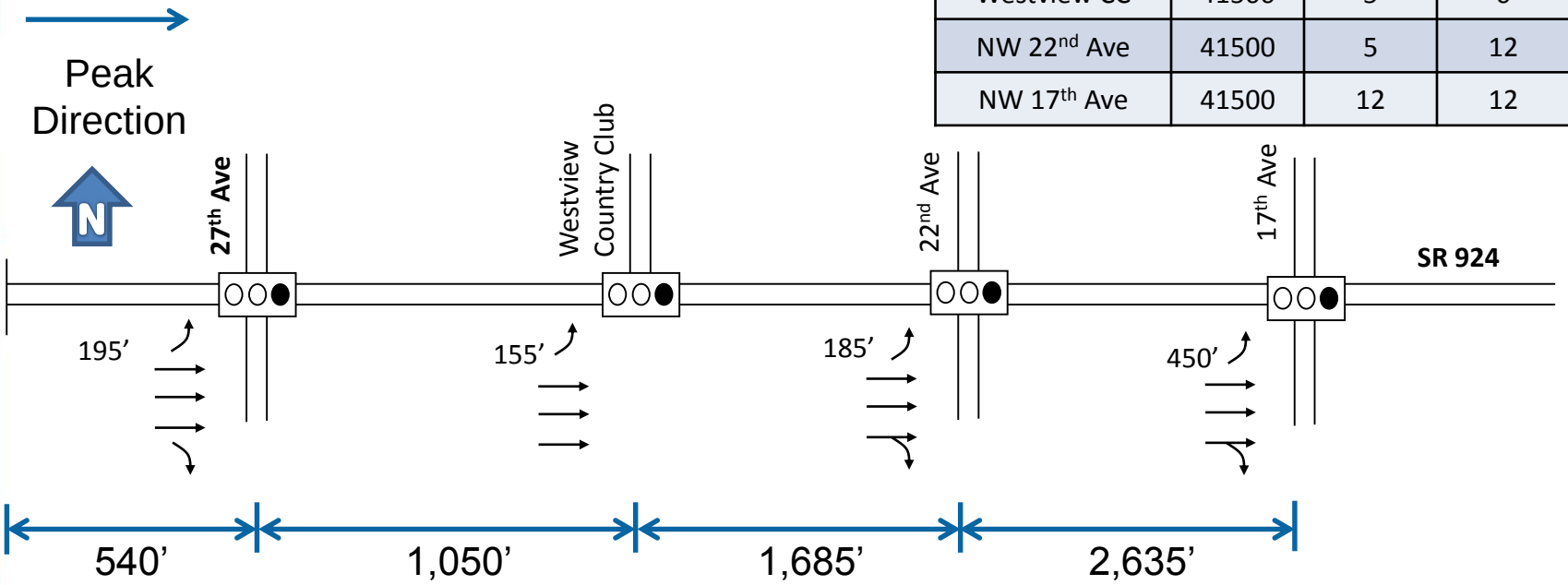
Use data file saved from Workshop 3 in ARTPLAN unit for this Bus Workshop 4

Workshop #4 *Known Inputs & Multimodal Analysis*

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

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

Segment	AADT	% Left Turns	% Right Turns
NW 27th Ave	41500	8	12
Westview CC	41500	5	0
NW 22nd Ave	41500	5	12
NW 17th Ave	41500	12	12

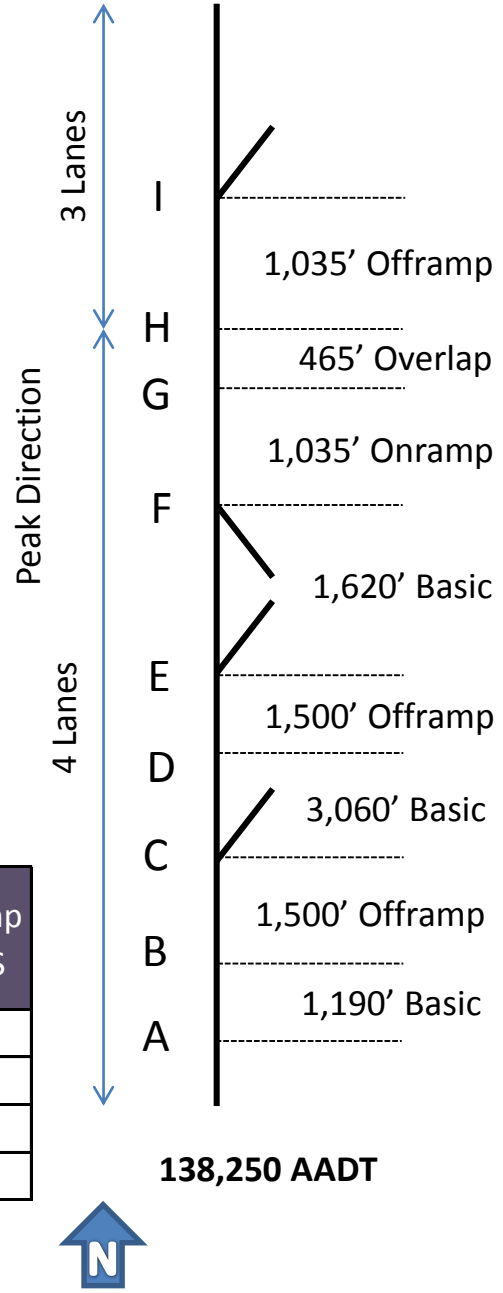


Example 1

Basic/Ramps/Ramp Overlap

I-4 between Princeton St & Lee Rd, Orlando

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



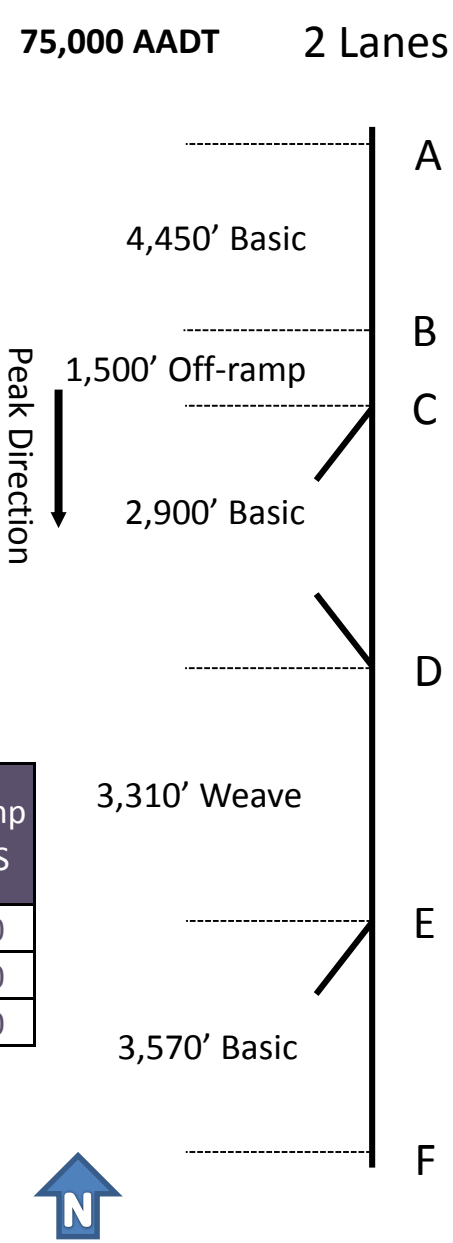
D-Factor	% Heavy Vehicles	Local Adjustment Factor
51.8	4.0	0.98

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

Workshop 1 *Basic/Ramps/Weave*

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

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



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

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

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

Show Aerial of I-4

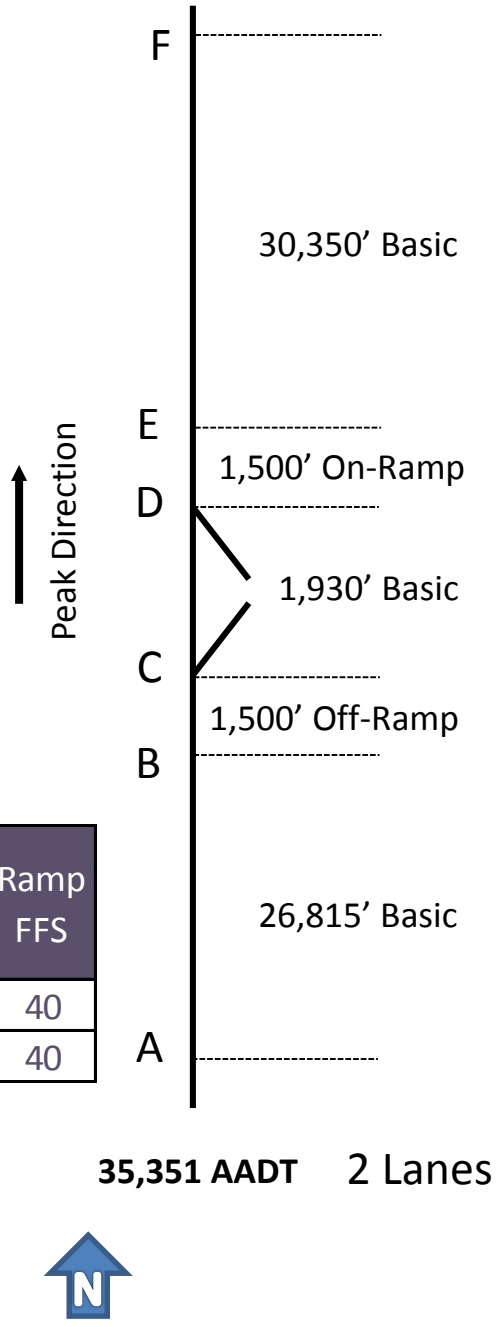
Workshop 2 *Basic/Ramps*

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



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