

### I-195/SR 112/Julia Tuttle Causeway Bus on Shoulder (BOS) Discussion



August 8, 2018 (11:00 AM)  
FDOT, District 6 – Executive Conference Room

#### **PURPOSE OF MEETING**

Florida Department of Transportation (FDOT) D6 convened this meeting with Miami-Dade Department of Transportation and Public Works (DTPW) and the City of Miami Beach, to review criteria for Bus on Shoulder (BOS) design and operations as well as discuss necessary steps for implementation on the Julia Tuttle Causeway.

#### **KEY TAKEAWAYS**

- The limited option of implementing BOS Use in the Outside shoulders on the Causeway (with only lane restriping, relocation of rumble strips) is not a quick process. The preparaton, coordination and general timeframe associated with this option is similar to the more involved options that include full reconstruction of the shoulders for either the inside our outside shoulders.
- To be really effective, the implementation of BOS use on the Causeway needs to be coupled with designing and building exclusive lanes (both exiting and entering the Causeway) to By-Pass bottlenecks on the east end in Miami-Beach near Alton Road.
- Overall timeframe to evaluate, design and build improvements is approximately 4 years assuming there are no right-of-way requirements associated with these improvements.

#### **ATTENDEES**

##### **Name**

Jim Wolfe, P.E.  
Harold Desdunes, P.E.  
Ken Jeffries  
Shereen Yee Fong  
Joan Shen, P.E.  
Nilia Cartaya  
Monica Cejas, P.E.  
Matt Vinke, AICP  
Jimmy Morales.  
José González, P.E.  
Jose Muñoz, P.E.  
Lorin Brissett, P.E.  
Alfred Lurigados, P.E.

##### **Organization/Company**

FDOT D6 / District Secretary  
FDOT D6 / Transportation Development Director  
FDOT D6 / Planning Manager  
FDOT D6 / Project Manager  
FDOT D6 / District Modal Development Office  
FDOT D6 / District Modal Development Office  
Miami-Dade DTPW / Chief  
Miami-Dade DTPW / Transit Planner  
City of Miami Beach / City Manager  
City of Miami Beach / Transportation Director  
BCC Engineering / Consultant PM, I-195 Planning Study  
BCC Engineering / Consultant Deputy PM  
BCC Engineering / Consultant Government Liaison

N/A

\*Participation via teleconference.

## **MEETING AGENDA**

The following items were discussed:

- FDOT Statewide BOS Guidance
- FDOT Speed Criteria vs MD DTPW Speed Criteria for BOS
- Inside Shoulder Evaluation vs. Outside Shoulder Evaluation
- Estimated Costs for Alternatives
- Estimated time frame for alternatives
- Next Steps

An electronic version of meeting handouts are included as attachments to this summary.

## **ITEMS DISCUSSED**

- **Ms. Shereen Yee Fong (FDOT)** gave an overview of the FDOT process according to the Statewide Guidance – January 2017 for implementing BOS on the Julia Tuttle Causeway.
- **Lorin Brissett (BCC)** gave a brief presentation on the likely frequency of BOS use as well as design considerations and costs related to using Inside Shoulders versus Outside Shoulders for BOS operations:

### Criteria

- FDOT criteria allow BOS use when general traffic average speeds < 35 mph.
- MD DTPW criteria allow BOS use when general traffic average speeds < 25 mph.
- For both criteria, the maximum speed differential between buses operating in shoulders and traffic in general purpose lane should not exceed 15 mph.
- Once in shoulders, buses cannot exceed 35 mph.

### Periods of Likely Use

- AM peak period in the eastbound and the PM peak period in the westbound on weekdays using FDOT criteria of average speeds < 35 mph.
- Only in AM peak period in the eastbound on weekdays using MD DTPW criteria of average speeds < 25 mph.
- No weekend use of shoulders for BOS operations is anticipated.

### Requirements and Costs for implementing

- All options require coordination at the Local, State (District & Central Office) and Federal Level.
- Inside shoulders Option
  - Requires restriping lanes
  - Full reconstruction of shoulders.
  - Relocation of rumble strips.
  - New signage.
  - Cost estimated at \$2.6 Million
- Outside shoulders Options
  - Three potential options
    - Full reconstruction of shoulders.
    - Overbuilding for cross slope correction only
    - Lane restriping, rumble strip relocation and new signage only.

- Cost estimated to range from \$1.5 Million to \$2.7 Million
- **Monica Cejas (MD DTPW)** indicated that:
  - The policy for BOS use was established in 2007 for SR 874 and 878 but that it was intended to be a “living document” that could be amended as new information warrants.
  - There are two types of BOS use the DTPW is contemplating along the Tuttle:
    - A. Conditional BOS use which is prescribed in the FDOT statewide Guidance to only allow BOS use when average speeds are less than 35 mph. Once traveling in the shoulders, all the aforementioned restrictions on bus operating speeds would apply.
    - B. Permanent BOS Use where buses would be allowed to use the Inside shoulders irrespective of the speeds in the adjacent travel lanes. Under this regime, buses would be allowed to travel up to the posted speed limit with no limit on speed differential between buses operating in the shoulder lanes and buses traveling in the adjacent lanes using bus signal preemption at the intersection of Alton Road with Arthur Godfrey Road.
      - **Harold Desdunes (FDOT)** indicated that the regime of permanent BOS use would have to be further evaluated with respect to safety, design requirements and impact on operations.
      - **Ms. Cejas (MD DTPW)** mentioned they anticipate a 14' shoulder width would be required for permanent BOS use.
  - MD DTPW envisions that traffic bottlenecks approaching Alton Road in the eastbound direction, would thwart the effectiveness of eastbound BOS operations if not mitigated.
    - A. MD DTPW has contemplated the implementation of an exclusive lane in the eastbound direction approaching Alton Road that would allow buses exiting the shoulder to by-pass congestion at the intersection as part of the new BERT service:
    - B. For the westbound direction, MD DTPW envisions that the project underway by FDOT to improve westbound on-ramp operations from Alton Road near Mt. Sinai, will be critical to relieving the bottleneck in the westbound direction prior to Buses entering the shoulders.
- **Secretary Wolfe (FDOT)** agreed that implementing BOS use along the Causeway without the implementation of By-Pass lanes, would not be effective. FDOT is open to considering the implementation of a By-Pass lane subject to there being no impact on existing ROW.
  - He acknowledged that the need for this hybrid improvement will be even greater given the anticipated increase in future traffic demand on the Causeway.
- **Jose Muñoz (BCC)** requested MD DTPW provide more information on the route for the new express bus service (BERT) heading eastbound into Miami with respect to whether it will first head north or south on Alton Road after leaving the Causeway. This will have a bearing on the optimal placement of the exclusive by-pass lane as well as use of outside versus inside shoulders for BOS operations.

- **Monica Cejas (MD DTPW)** indicated that no funding has been allocated for the BERT study although a request has been made to the Miami-Dade Transportation Planning Organization to include in their List of Priority Projects.
- **Open Discussion on Impact to Bike Pilot Project in Outside Shoulders:**
  - **Harold Desdunes (FDOT)** mentioned if Bike Pilot Project on Causeway is suspended to make room for BOS operations in outside shoulders, the Pilot project could not be reinstated.
  - **Ken Jeffries (FDOT)** mentioned that the pilot project was implemented as one of three pilot projects within the State to evaluate Bike use on Limited Access Facilities.
- **Likely Schedule for BOS Implementation and Scope:**
  - **Harold Desdunes (FDOT)** indicated.
  - Scope for redesigning shoulders for BOS operations is being developed and will be expanded to include the design of the exclusive lanes to alleviate bottlenecks. MD DTPW would need to provide FDOT with information confirming that the implementation of turn lanes would not require additional ROW.
  - General time frame to procure, design and reconstruct shoulder for BOS use is anticipated at 4 years from the present assuming no impacts to ROW.
- **City of Miami Beach Perspective:**
  - **Jimmy Morales (Miami-Beach)** with a fuller picture of the steps and other considerations involved, acknowledged that the implementation of BOS operations would not be a quick process but would require further review and coordination. He will apprise the City Commission of the status of the project providing them with an estimate of the working timeline for implementation.
- **Miami-Dade DTPW Closing Comments:**
  - **Monica Cejas (MD DTPW)** MD DTPW would:
    - Rely on FDOT to help prepare the application and justification for BOS use.
    - Rely on FDOT to further evaluate incorporating the implementation of exclusive lanes to by-pass bottlenecks and augment BOS operations.

### Action Items

- **Monica Cejas (MD DTPW)** will finalize the route for the new express bus (BERT) service entering the Beach and provide to **Shereen Yee Fong (FDOT)**.
- **FDOT** will:
  - Finalize response letters to the City of Miami Beach as well as the Miami-Dade TPO resolutions regarding the timeline, steps and considerations for BOS implementation based on the discussions at this meeting.
  - Investigate what adjustments to the scope for the I-195 Corridor Planning Study currently underway may be necessary to incorporate the evaluation of the exclusive lanes to reduce eastbound bottlenecks.
- **Jimmy Morales (Miami-Beach)** will apprise the City Commission of the status of the project providing them with an estimate of the working timeline for implementation.

# Sign-In Sheet

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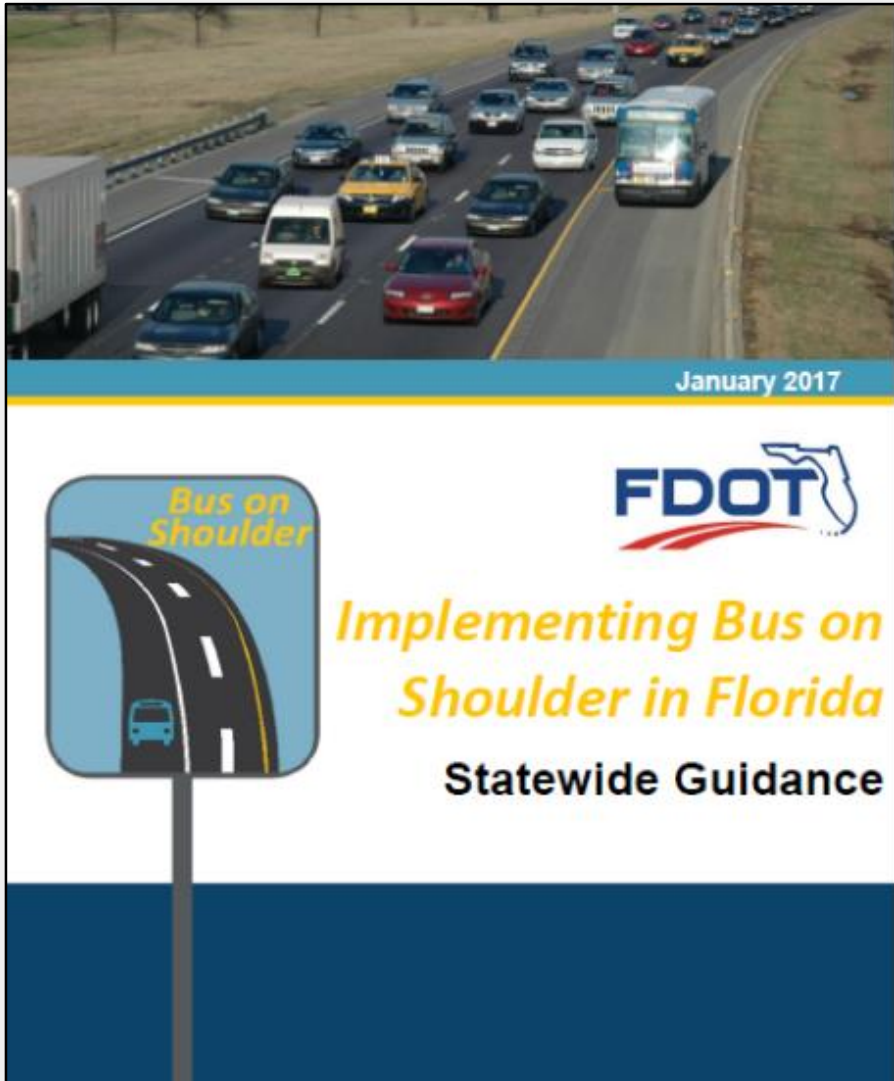


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# FDOT STATEWIDE BOS GUIDANCE – January 2017



- Project Justification Checklist.
- Design Criteria.
- Operating Criteria.
- Implementation.
- Post Implementation.
- [http://www.fdot.gov/transit/Pages/Bus on shoulders Guidance 013117.pdf](http://www.fdot.gov/transit/Pages/Bus_on_shoulders_Guidance_013117.pdf)

# BOS FREQUENCY EVALUATION – SPEED DATA INVENTORY

- Regional Integrated Transportation Information System (**RITIS**) database.
  - Central Office uses RITIS to host speed and travel time data on State facilities collected at the District level around the State.
  - Data were aggregated in Hourly Increments at segment level.
  - Allows historical review of speed and travel time data.





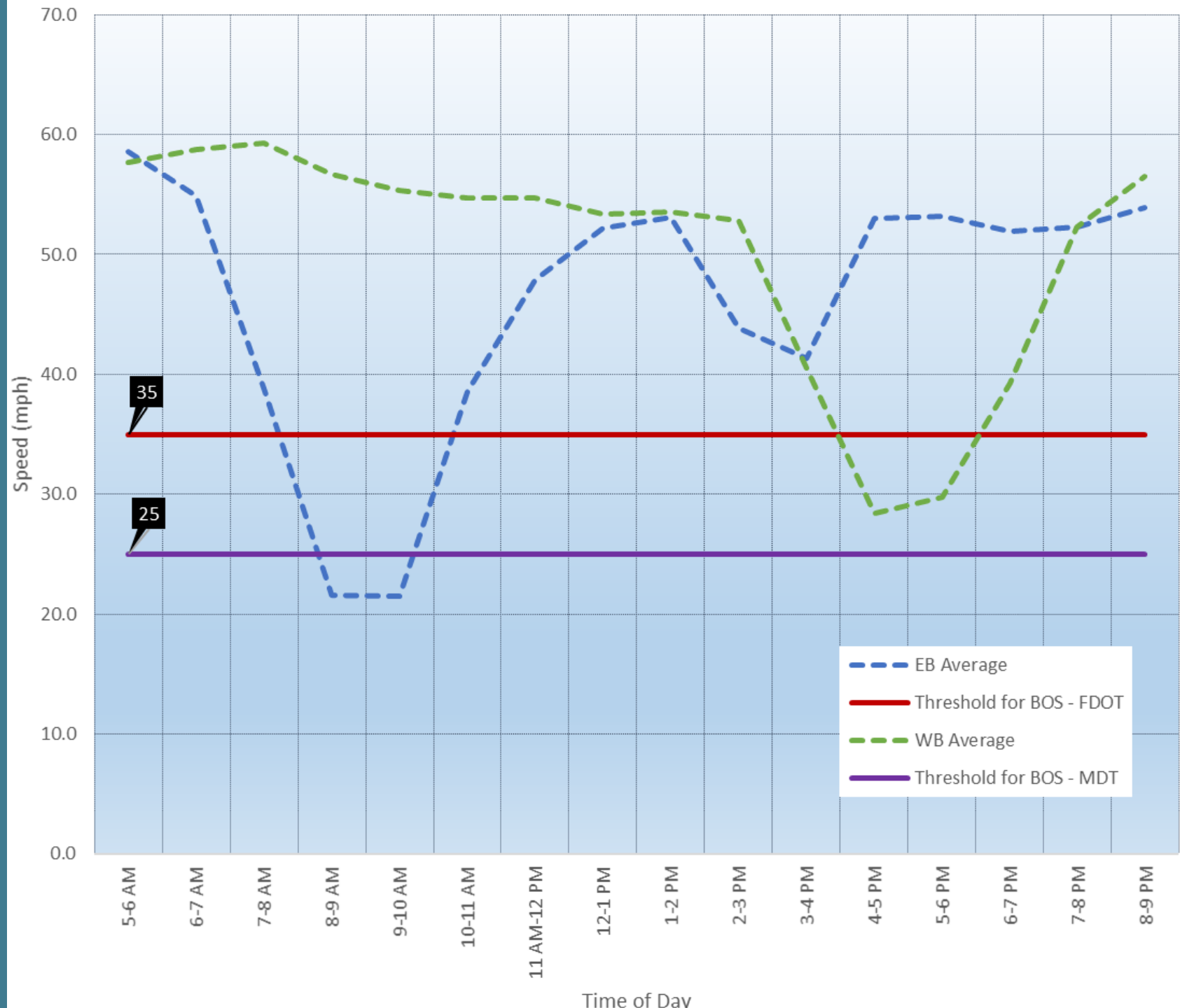
# BOS FREQUENCY EVALUATION – WEEKDAY RESULTS (TABULAR)

Travel Direction	Day of Week	Speed (mph)															
		5-6 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM	10-11 AM	11 AM-12 PM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	7-8 PM	8-9 PM
Eastbound	Tue	58.7	55.5	46.3	25.3	23.9	47.4	49.2	53.6	54.9	46.5	43.5	54.8	54.7	54.1	53.2	53.0
	Wed	58.4	54.0	26.3	18.3	20.3	32.9	48.4	52.6	52.8	45.6	49.3	53.6	54.2	52.8	51.8	53.9
	Thu	58.8	55.2	43.8	21.1	20.4	35.5	45.9	50.2	51.5	39.4	31.2	50.5	50.6	48.7	51.8	54.8
	EB Average	58.6	54.9	38.8	21.6	21.5	38.6	47.9	52.2	53.1	43.8	41.3	53.0	53.2	51.9	52.3	53.9
Westbound	Tue	58.5	58.2	59.6	55.8	55.0	54.7	55.2	54.2	55.6	54.2	43.4	27.0	28.0	38.2	51.7	58.0
	Wed	57.2	58.4	59.3	57.4	55.5	55.3	54.6	51.6	50.5	51.9	38.2	28.4	31.3	42.5	53.5	55.9
	Thu	57.2	59.5	59.1	56.9	55.7	54.2	54.4	54.3	54.5	52.3	40.0	29.7	30.0	37.0	51.8	55.7
	WB Average	57.6	58.7	59.3	56.7	55.4	54.7	54.7	53.4	53.6	52.8	40.5	28.4	29.8	39.2	52.3	56.5

## Notes:

1. RITIS Speed Data for Causeway from January 24, 2017 through April 20, 2017 (Every Tuesday, Wednesday and Thursday).
2. Speeds less than 35 MPH = FDOT Criterion for BOS Operation.
3. Speeds less than 25 MPH = MDT Criterion for BOS Operation.

# WEEKDAY RESULTS (GRAPHICAL)



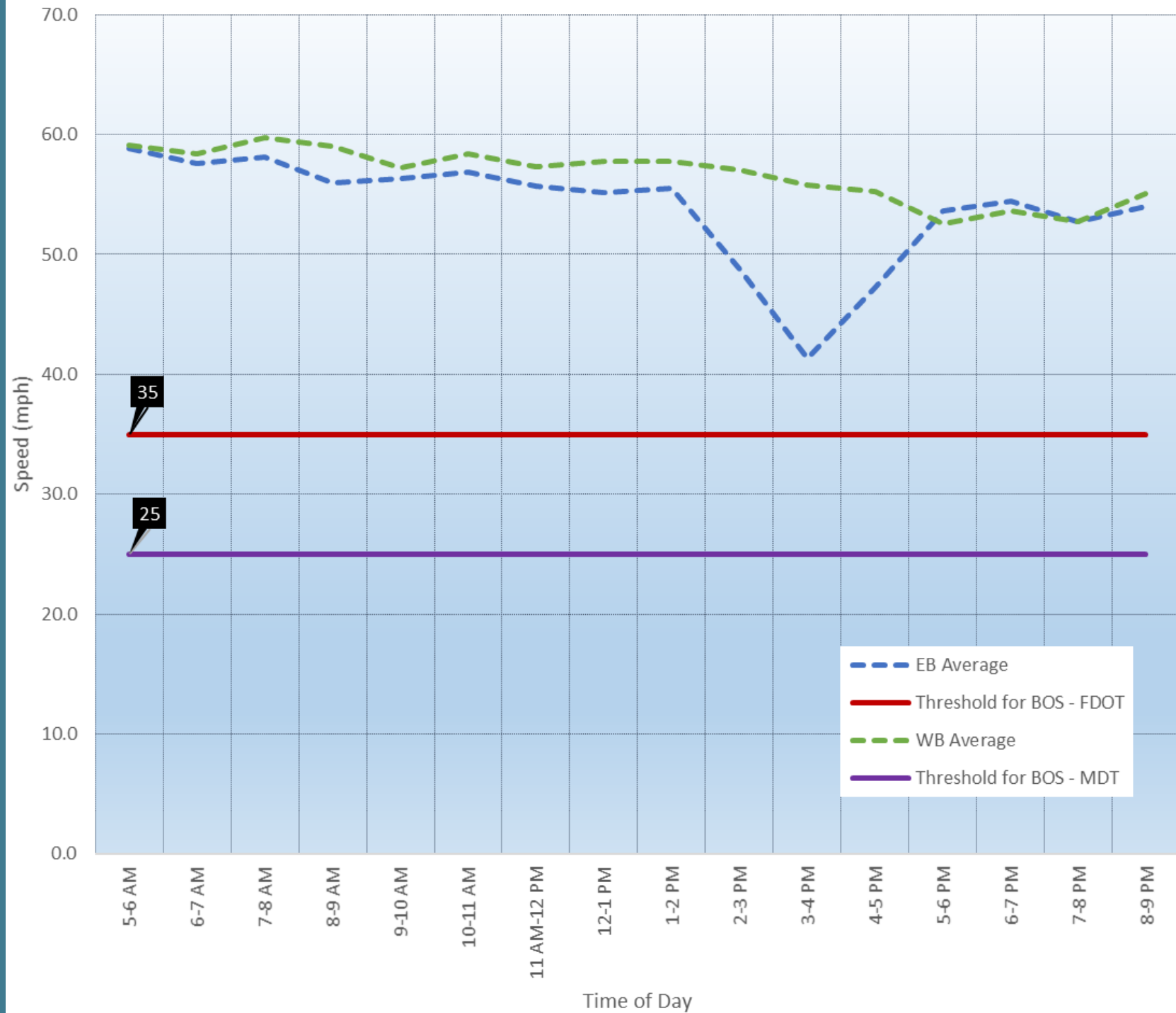
# BOS FREQUENCY EVALUATION – SATURDAY RESULTS (Tabular)

Travel Direction	Day of Week	Speed (mph)															
		5-6 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM	10-11 AM	11 AM-12 PM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	7-8 PM	8-9 PM
Eastbound	Sat	58.8	57.6	58.1	55.9	56.3	56.8	55.7	55.1	55.5	48.8	41.4	47.3	53.7	54.4	52.7	54.0
	EB Average	58.8	57.6	58.1	55.9	56.3	56.8	55.7	55.1	55.5	48.8	41.4	47.3	53.7	54.4	52.7	54.0
Westbound	Sat	59.2	58.4	59.7	59.0	57.3	58.4	57.3	57.8	57.8	57.1	55.8	55.3	52.6	53.6	52.8	55.1
	WB Average	59.2	58.4	59.7	59.0	57.3	58.4	57.3	57.8	57.8	57.1	55.8	55.3	52.6	53.6	52.8	55.1

Notes:

1. RITIS Speed Data for Causeway from January 21, 2017 through April 23, 2017 (Every Saturday in between this time frame)

# SATURDAY RESULTS (GRAPHICAL)



# BOS FREQUENCY EVALUATION – SUNDAY RESULTS (Tabular)

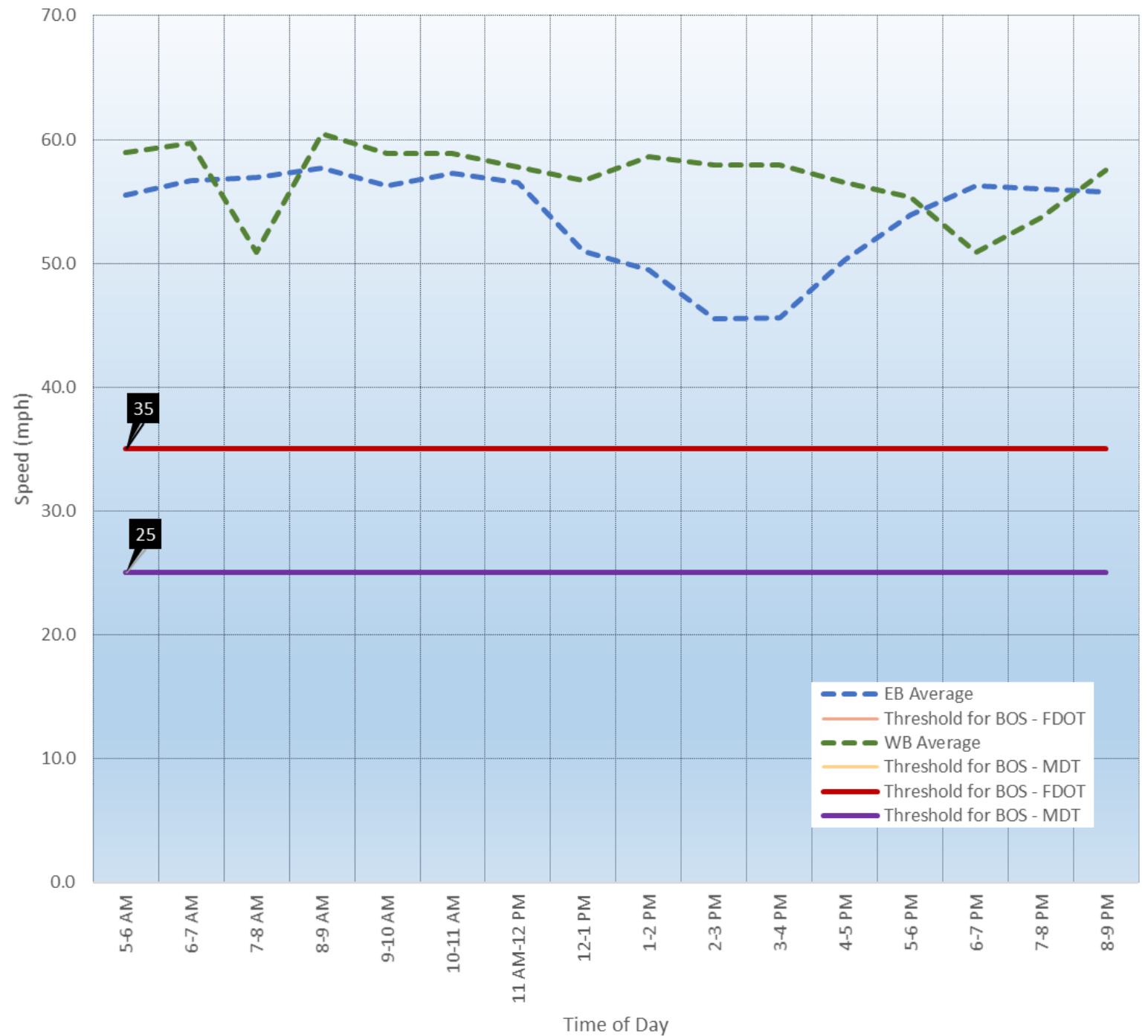
Travel Direction	Day of Week	Speed (mph)															
		5-6 AM	6-7 AM	7-8 AM	8-9 AM	9-10 AM	10-11 AM	11 AM-12 PM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	7-8 PM	8-9 PM
Eastbound	Sun	55.5	56.7	56.9	57.7	56.3	57.3	56.5	51.0	49.5	45.5	45.6	50.3	53.9	56.2	56.0	55.8
	<b>EB Average</b>	<b>55.5</b>	<b>56.7</b>	<b>56.9</b>	<b>57.7</b>	<b>56.3</b>	<b>57.3</b>	<b>56.5</b>	<b>51.0</b>	<b>49.5</b>	<b>45.5</b>	<b>45.6</b>	<b>50.3</b>	<b>53.9</b>	<b>56.2</b>	<b>56.0</b>	<b>55.8</b>
Westbound	Sun	59.0	59.7	50.9	60.5	58.9	58.8	57.8	56.7	58.6	57.9	57.9	56.5	55.3	50.9	53.6	57.5
	<b>WB Average</b>	<b>59.0</b>	<b>59.7</b>	<b>50.9</b>	<b>60.5</b>	<b>58.9</b>	<b>58.8</b>	<b>57.8</b>	<b>56.7</b>	<b>58.6</b>	<b>57.9</b>	<b>57.9</b>	<b>56.5</b>	<b>55.3</b>	<b>50.9</b>	<b>53.6</b>	<b>57.5</b>

Notes:

1. RITIS Speed Data for Causeway from January 21, 2017 through April 23, 2017 (Every Sunday in between this time frame) excluding the speeds on Sunday of April 2, 2017 for the eastbound direction which was determined to be an outlier.



# SUNDAY RESULTS (GRAPHICAL)



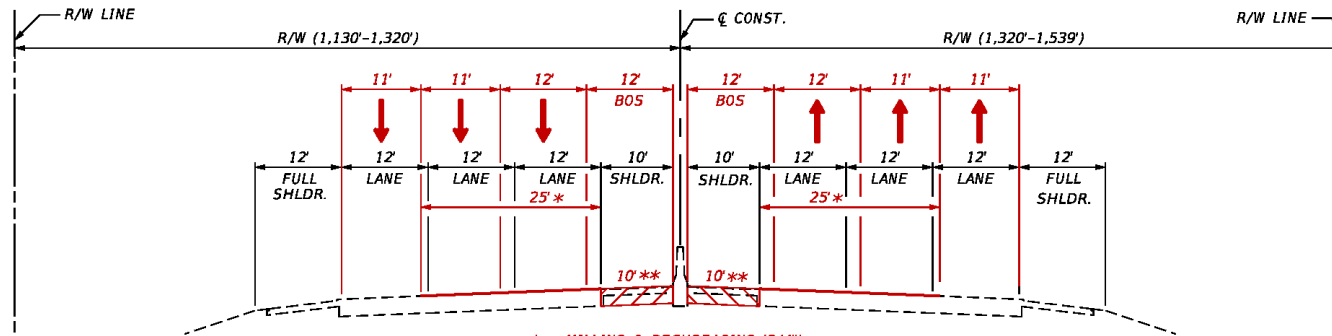
# BOS FREQUENCY EVALUATION – PERIODS OF LIKELY USE

Travel Direction	Weekday		Saturday		Sunday	
	BOS Use Times <sup>1</sup>	Duration (hours)	BOS Use Times <sup>1</sup>	Duration (hours)	BOS Use Times <sup>1</sup>	Duration (hours)
Eastbound	8:00 AM to 10:00 AM <sup>2</sup>	2	N/A <sup>3</sup>	N/A <sup>3</sup>	N/A <sup>3</sup>	N/A <sup>3</sup>
Westbound	4:00 PM to 6:00 PM	2	N/A <sup>3</sup>	N/A <sup>3</sup>	N/A <sup>3</sup>	N/A <sup>3</sup>

Notes:

1. Based on FDOT criterion of operating speeds less than 35 MPH.
2. If the more restrictive MDT criterion of operating speeds of less than 25 MPH is considered, the likely frequency of BOS use times will be reduced to only the weekday AM Peak period for a shorter duration in the eastbound direction.
3. Bus On Shoulder use does not appear to be warranted during any period of the day and for the travel direction specified.

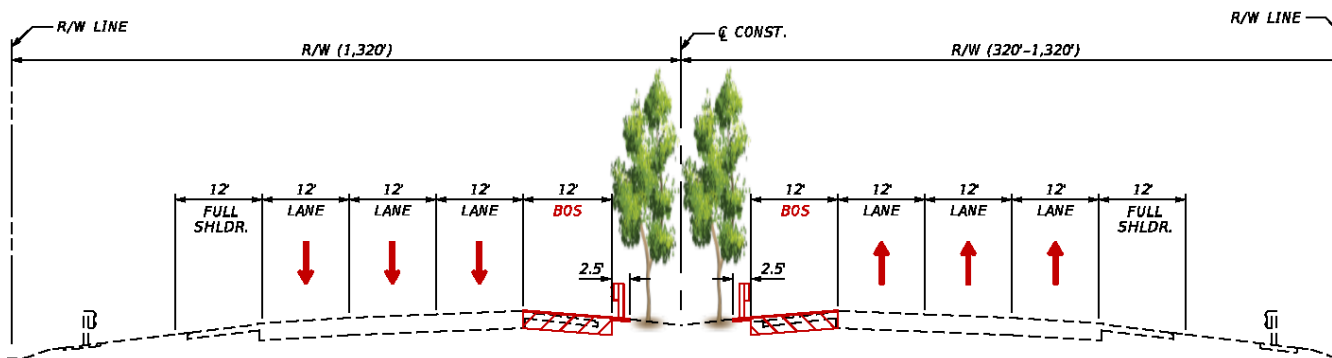
# INSIDE SHOULDER OPTION - OVERVIEW



\* MILLING & RESURFACING (3/4")  
 \*\* RECONSTRUCTION EXIST 10' SHOULDER

## TYPICAL SECTION SR 112 (I-195)

STA. 135+50.00 TO STA. 147+54.00  
 STA. 169+45.00 TO STA. 176+50.00  
 STA. 240+00.00 TO STA. 244+05.00  
 STA. 255+83.00 TO STA. 284+08.00

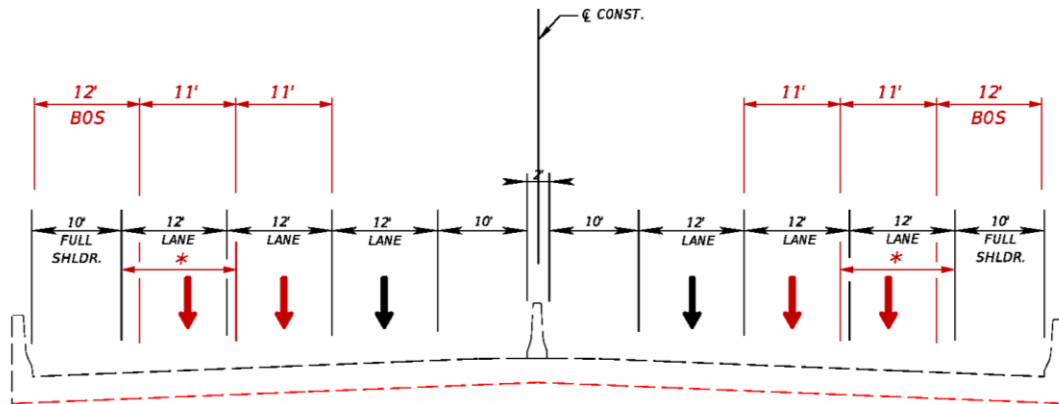
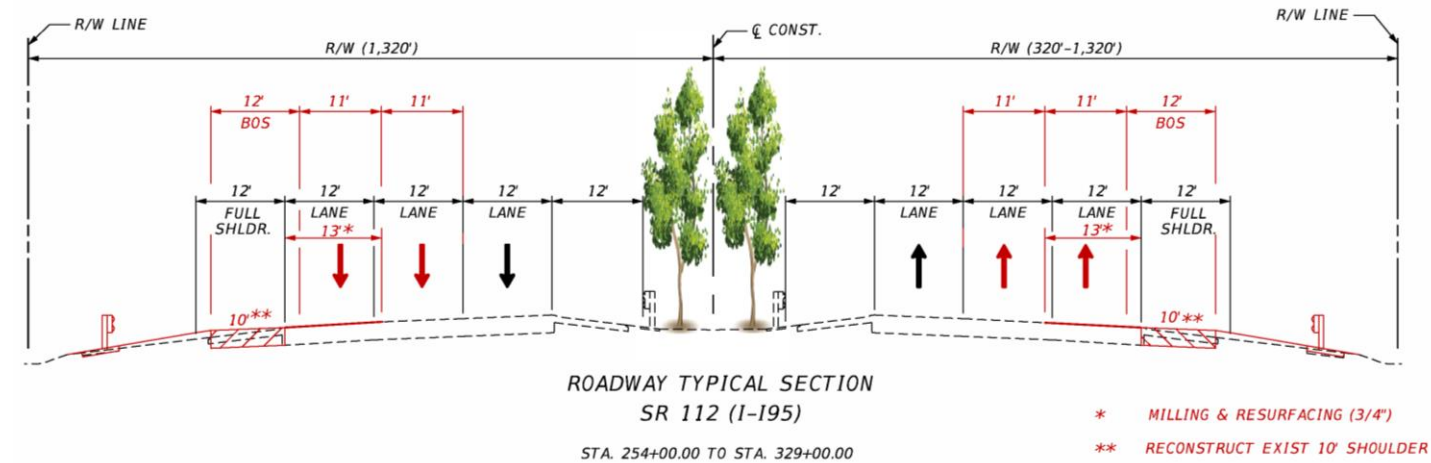


## TYPICAL SECTION SR 112 (I-195)

STA. 176+50.00 TO STA. 240+00.00

- Relocate Rumble Strips from outside edge to center of shoulders.
- Restripe lanes to allow 12' for median shoulder lane.
- Add new standard guard rail.
- Add signage to signal BOS Operation.
- Reconstruct Pavement.

# OUTSIDE SHOULDER OPTION - OVERVIEW



- Relocate Rumble Strips from outside edge to center of shoulders.
- Restripe lanes to allow 12' for paved outside shoulder lane.
- Add new standard guard rail.
- Add signage to signal BOS Operation.
- **Reconstruct Pavement.**
- **Overbuild for cross slope correction.**
- **Relocate drainage features.**

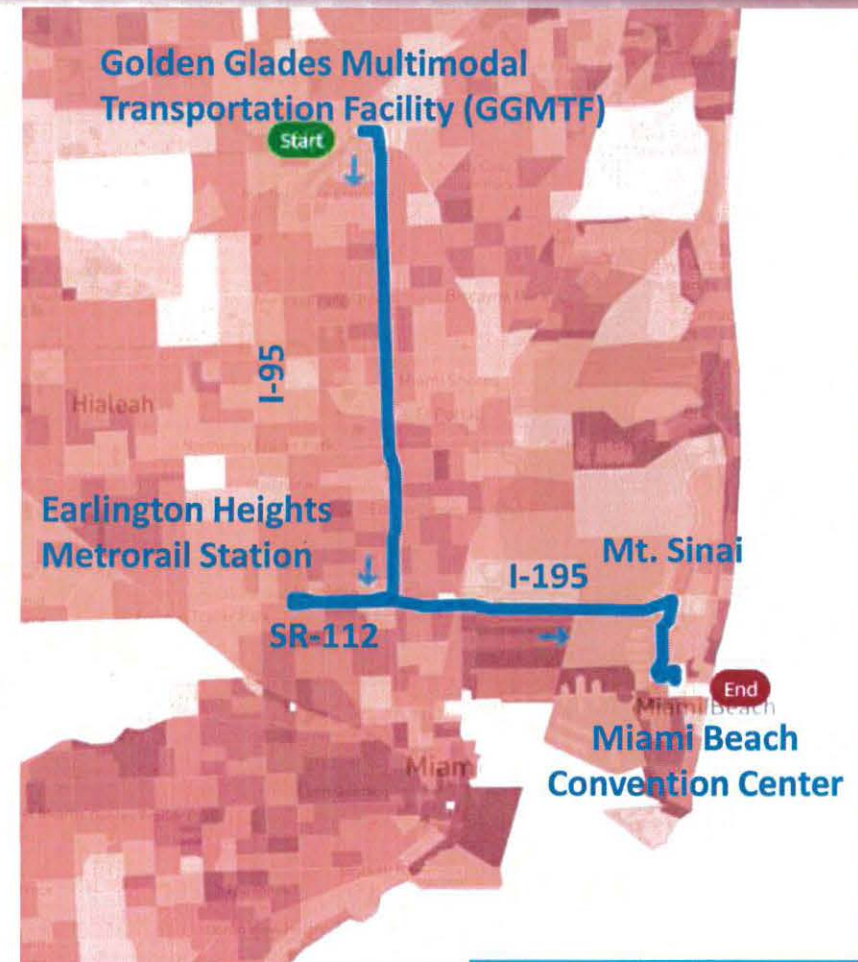
# OPTIONS MATRIX

OPTION	Implementation Cost	Impact on Bicycle Traffic?	Public Involvement?	Agency Coordination?
<b>Inside Shoulders</b>	\$2,600,000	None	Outreach Required	Local, State (District & Central Office) and Federal Required.
<b>Outside Shoulders</b> (Full Reconstruction)	\$2,700,000	Yes, Requires Suspending Pilot Project in Outside Lane)	Outreach Required	Local, State (District & Central Office) and Federal Required.
<b>Outside Shoulders</b> (Overbuilding for Cross Slope Correction Only)	\$2,200,000	Yes, Requires Suspending Pilot Project in Outside Lane)	Outreach Required	Local, State (District & Central Office) and Federal Required.
<b>Outside Shoulders</b> (Lane Restripe, Rumble Strips Relocation, Signage - Only)	\$1,500,000	Yes, Requires Suspending Pilot Project in Outside Lane)	Outreach Required	Local, State (District & Central Office) and Federal Required.



# Beach Express North – Route f1

- Pending completion of FDOT's Golden Glades Multimodal Transportation Facility (GGMTF). Project completion is anticipated in 2020
- Express Bus service between the Golden Glades Multimodal Terminal with the area of Miami Beach Convention Center
  - Coordinating with the City of Miami Beach on terminal location and alignment
  - Coordinating with FDOT to use shoulders along I-195
- FM# 436533-1 (SR-112/I-195 over Biscayne Bay Bridge #870302): to be completed by Fall 2018
- FM# 435843-1 (SR-112/I-195 Frontage Rd and Ramp Realignment): to be completed by 2021
- FM# 428358-5 (I-95 NB from Biscayne River Canal to Miami Gardens Dr): to be completed by 2022



Opening: 2020  
Capital: \$9.5M  
O&M: \$3.8M  
(FY20 \$)



