



# Mobility Performance Measures

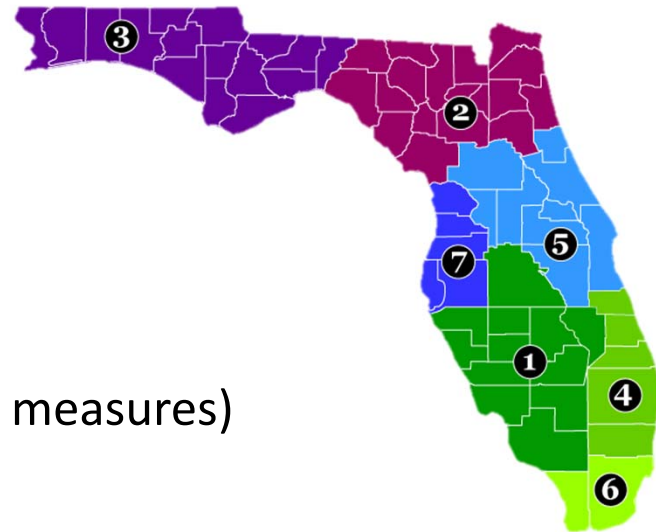
**Doug McLeod** (MAP-21 measures)

FDOT Mobility Performance Measures Program Manager

TRB Performance Measurement Committee

**Jessica VanDenBogaert** (additional performance measures)

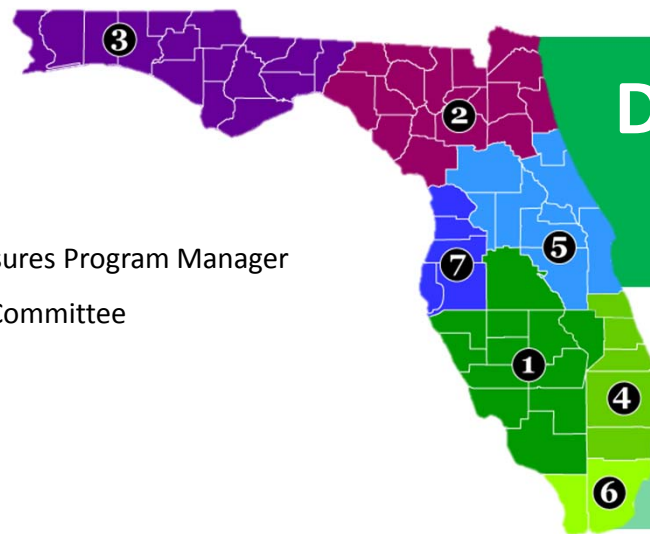
FDOT Travel Time Reliability Coordinator



October 12, 2017



# Mobility Performance Measures Outreach



**DISTRICTS 1-7**

All 27 MPOs

## **Doug McLeod**

FDOT Mobility Performance Measures Program Manager  
TRB Performance Measurement Committee

**TBA**, FDOT Policy Planning

## **Anita Vandervalk**

Cambridge Systematics Principal  
Co-PI on NCHRP Report 666 on Target Setting

October 2016 - February 2017

# Perceived Keys to Success in Florida

Our (FDOT/MPO) joint coordination with a common approach

We (FDOT & MPOs) will comply with ultimate federal requirements

FHWA  
Headquarters  
quote

FDOT/MPOs can  
“use their own measures in  
performance-based planning”

- Florida can use measures and calculation techniques most relevant to us
  - Travel time reliability
  - Congestion
  - Multimodal
  - Other



FDOT supply every MPO

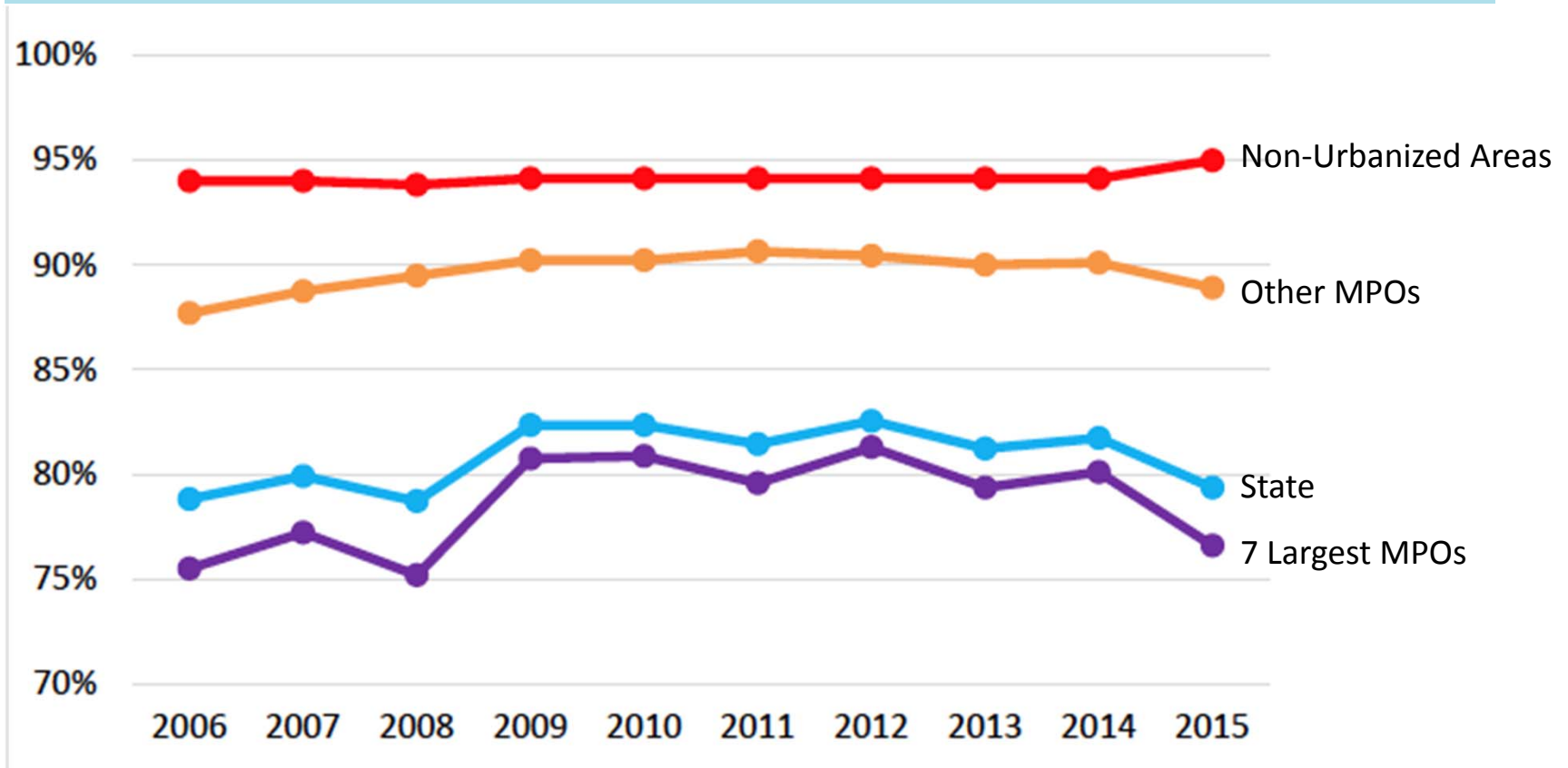
- Federally required measures
- MPOAC agreed upon additional measures



# Preliminary TTR Analyses

## Travel Time Reliability on Freeways During Peak Hour/Peak Period

FDOT  
(prior to  
MAP-21  
mobility-  
related  
NPRM)



SOURCE  
BOOK

# Preliminary TTR Analyses

TTI (for specific MAP-21 NPRM related measures)

Urbanized Areas	% System where Peak Hour Travel Times Meet Expectations		
	Desired Speed/Travel Time	2014	2015
<b>Jacksonville</b>			
Interstate	50 mph	87.0%	82.7%
Other NHS	20 mph	95.1%	95.8%
<b>Miami</b>			
Interstate	50 mph	76.8%	70.5%
Other NHS	20 mph	85.1%	84.5%
<b>Orlando</b>			
Interstate	50 mph	70.4%	67.1%
Other NHS	20 mph	94.5%	95.5%
<b>Tampa</b>			
Interstate	50 mph	79.0%	81%
Other NHS	20 mph	95.9%	95.9%



# Status of MAP-21 (FAST Act) Performance Measures Requirements



# (Mobility-Related) Federal Measures and Coverage

## NHS



- % of the Person-Miles Traveled on the Interstate That Are Reliable
- % of the Person-Miles Traveled on the Non- Interstate NHS That Are Reliable
- % Change in Tailpipe CO2 Emissions on the NHS Compared to the Calendar Year 2017 Level (in question)

## Freight



- Truck Travel Time Reliability Index

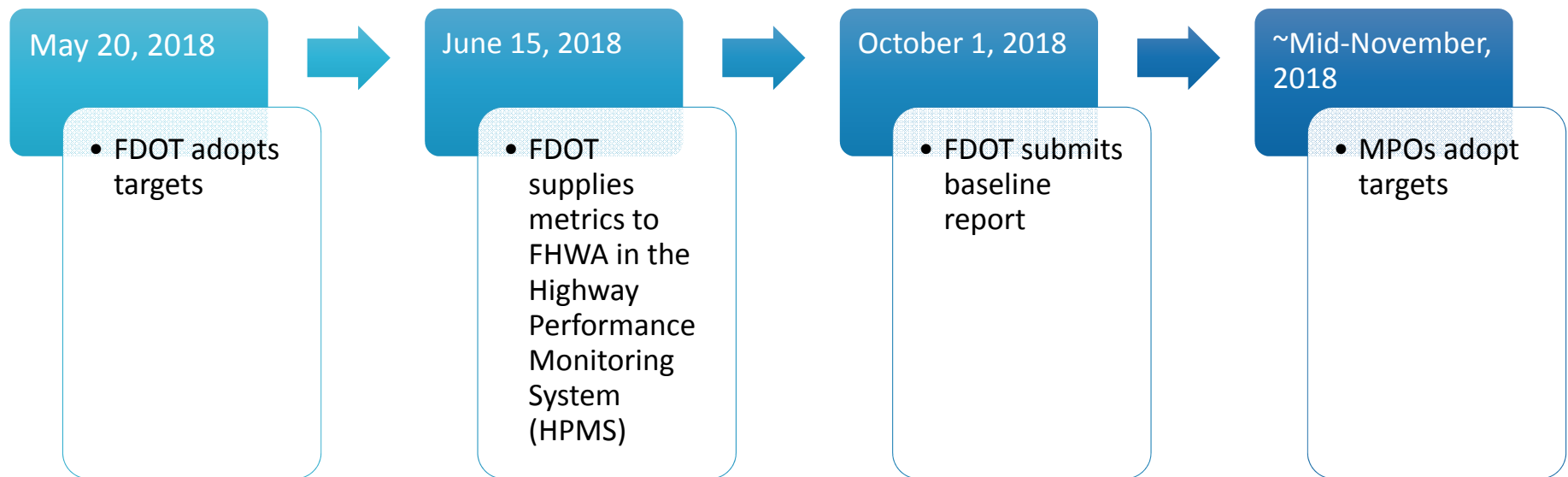
## CMAQ (Not applicable in Florida)



- Annual Hours of Excessive Delay Per Capita
- Percent of Non-SOV Travel
- Total Emission Reductions



# Implementation Due Dates



# Review of MAP-21 MPM Analysis Handout

(in MPOAC advance package)

<b>Coverage</b>	All MPOs	
	Statewide	
<b>Years</b>	2014-2016	
<b>Measures</b>	System Performance	Interstate (Level of travel time reliability; LOTTR) Non-Interstate NHS (Level of travel time reliability; LOTTR)
	Freight Movement	Interstate (Truck travel time reliability; TTTR)



# FDOT's Concerns with MAP-21 MPM Analysis Handout Results

- Results Measures
  - LOTTR on Interstates
  - **LOTTR on non-Interstate NHS**
  - TTTR on Interstates



## Causes

Previous 2014-2016 probe (NPMRDSv1) data

Other

### Concerns with probe data

- Amount of probes which analyses based upon
- Changing coverage of NHS routes
- Other (possibly treatment of data outliers)
- FHWA

# LOTTR on non-Interstate NHS

MPO	2014	2015	2016	
Bay County TPO	84%	82%	74%	
Broward MPO	37%	35%	36%	
Capital Region TPA	63%	59%	55%	
Charlotte County-Punta Gorda MPO	86%	77%	55%	
Collier County MPO	56%	46%	42%	
Florida-Alabama TPO	73%	71%	59%	
Gainesville MTPO	49%	44%	41%	
Heartland Regional TPO	95%	94%	92%	
Hernando/Citrus MPO	80%	77%	75%	
Hillsborough County MPO	65%	59%	56%	
Indian River County MPO	65%	57%	50%	
Lake-Sumter MPO	95%	94%	92%	
Lee County MPO	80%	70%	66%	
Martin MPO	80%	63%	68%	
METROPLAN Orlando	69%	67%	67%	
Miami-Dade TPO	32%	31%	30%	
North Florida TPO	62%	59%	60%	
Ocala/Marion County TPO	71%	65%	53%	
Okaloosa-Walton TPO	79%	72%	81%	
Palm Beach MPO	53%	48%	48%	
Pasco County MPO	83%	72%	67%	
Pinellas County MPO	54%	49%	47%	
Polk TPO	90%	88%	84%	
River to Sea TPO	51%	47%	39%	
Sarasota/Manatee MPO	76%	71%	60%	
Space Coast TPO	57%	51%	46%	
St. Lucie TPO	77%	68%	60%	
Statewide	63%	59%	57%	



# Going Forward

## FDOT MAP-21

Evaluation of 2017 probe (NPMRDSv2) data and results –

- January, 2018

Premature to address targets now

- Targets for FDOT (5/20/18)
- Targets for MPOs (~mid 11/18)

FDOT/MPO coordination

- Nov/Dec 2017
- February – May, 2018



# Additional Mobility Performance Measures for MPOs

Jessica VanDenBogaert

October 12, 2017



# Background

FDOT calculating  
anyway – so why not?

Preliminary effort in  
2014 well received

FYI & Optional



# Sample Handout

## FDOT Supplied MPO Mobility Performance Measure Analyses for 2015 (Broward MPO)

Date: 8/1/2017

Broward (Urbanized Area)										
Networks/Measures	A: Daily vehicle miles traveled (Millions)	B: Daily truck miles traveled (Millions)	C: Travel time reliability in the peak hour	D: Travel time variability	E: Daily vehicle hours of delay (Thousands)	F: Percent miles heavily congested	G: Percent sidewalk coverage	H: Percent bicycle lane coverage	I: Average job accessibility within 30 minute car trip (Millions)	J: Average job accessibility within 30 minute transit trip (Thousands)
A: National Highway System	26.6	2.1			66.9	13%				
B: Interstate	10.5	1.0	70%	1.94	23.6	42%				
C: Strategic Intermodal System <sup>1</sup>	16.2	1.6	69%	1.83	31.5	25%				
D: State Highway System	26.3	2.0			73.5	14%				
E: Freeways	15.5	1.5	77%	1.76	26.8	26%				
F: Non-freeways (SHS)	10.8	0.5			46.7	9%	89.3%	42.7%		

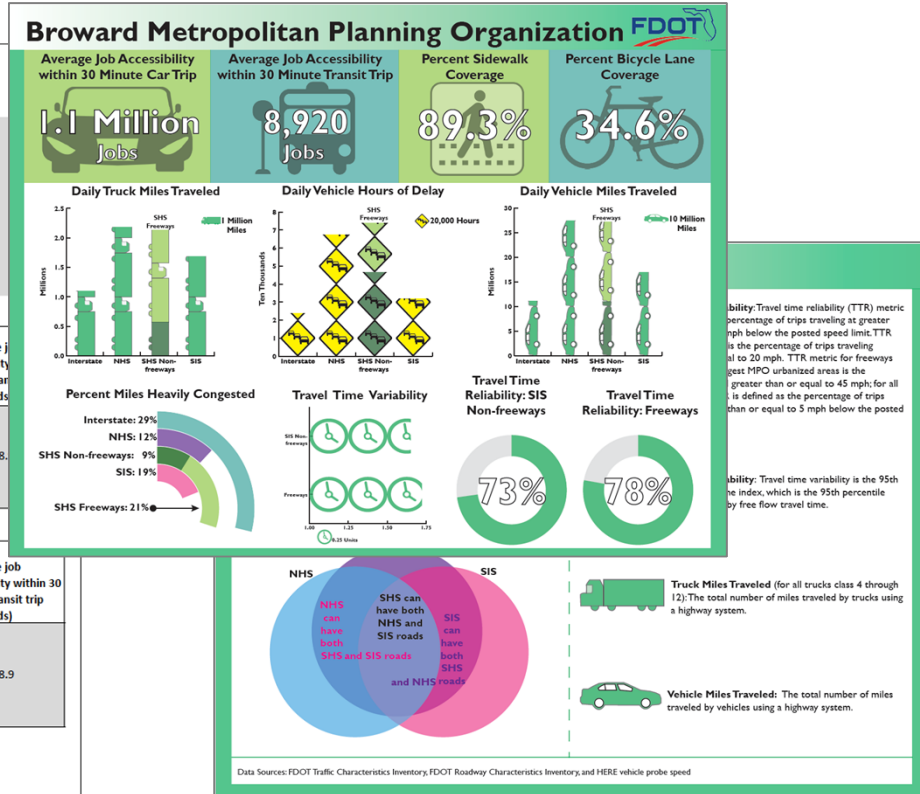
  

Broward (MPO/TPO Boundary)										
Networks/Measures	A: Daily vehicle miles traveled (Millions)	B: Daily truck miles traveled (Millions)	C: Travel time reliability in the peak hour	D: Travel time variability	E: Daily vehicle hours of delay (Thousands)	F: Percent miles heavily congested	G: Percent sidewalk coverage	H: Percent bicycle lane coverage	I: Average job accessibility within 30 minute car trip (Millions)	J: Average job accessibility within 30 minute transit trip (Thousands)
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B: Interstate	11.2	1.1	71%	1.85	24.0	29%			1.1	8.9
C: Strategic Intermodal System <sup>1</sup>	17.0	1.7	73%	1.65	32.0	19%				
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<sup>2</sup>Percent sidewalk coverage is limited to the urbanized area



## FDOT Supplied MPO Mobility Performance Measure Analyses for 2015 (Broward MPO)

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<sup>2</sup> Percent sidewalk coverage is limited to the urbanized areas



# Networks

- National Highway System
- Interstate
- SIS (Strategic Intermodal System)
- State Highway System
- Freeways
- Non-Freeways (SHS)

# Areas

Broward (Urbanized Area)

Networks/Measures	A: Daily vehicle miles traveled (Mill)	B: Daily truck miles traveled	C: Travel time reliability in the	D: Travel time	E: Daily vehicle hours of delay	F: Percent miles heavily congested	G: Percent sidewalk coverage	H: Percent bicycle lane coverage
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Urbanized Area

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MPO/TPO Boundaries

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A: National Highway System						2%				
B: Interstate						9%				
C: Strategic Intermodal System <sup>1</sup>						9%				
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County Boundaries



# Primary and Secondary Measures

Daily VMT	Daily Truck miles traveled	Travel Time Reliability	Travel Time Variability	Daily vehicle hours of delay	Percent miles heavily congested	Percent sidewalk coverage	Percent bicycle lane coverage	Average job accessibility (Auto)	Average job accessibility (Transit)
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In 2018:

Daily VMT	Daily Truck miles traveled	Travel Time Reliability	Travel Time Variability	Daily vehicle hours of delay	Percent miles heavily congested	Person miles traveled	Truck Travel Time Reliability	Average Travel Speed	Percent of travel meeting LOS criteria
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# Infographic

## Broward Metropolitan Planning Organization

Average Job Accessibility within 30 Minute Car Trip



Average Job Accessibility within 30 Minute Transit Trip



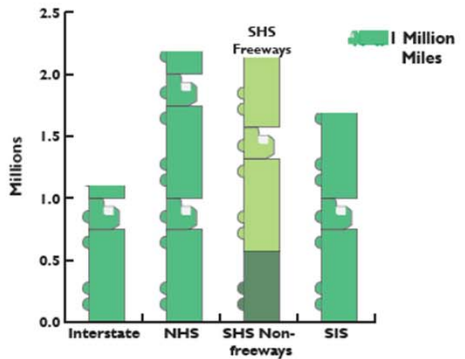
Percent Sidewalk Coverage



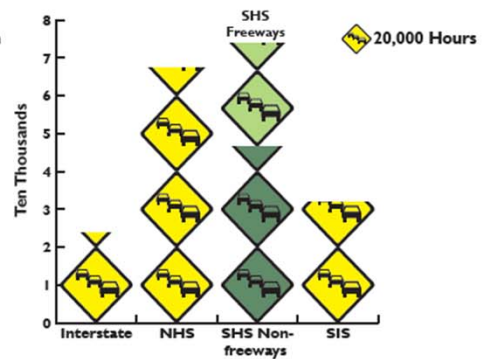
Percent Bicycle Lane Coverage



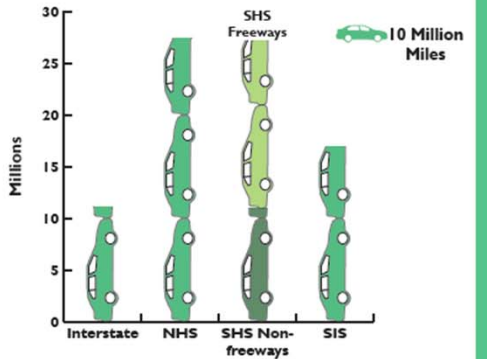
Daily Truck Miles Traveled



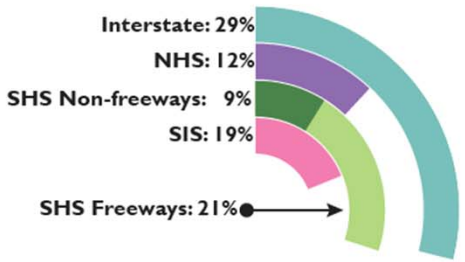
Daily Vehicle Hours of Delay



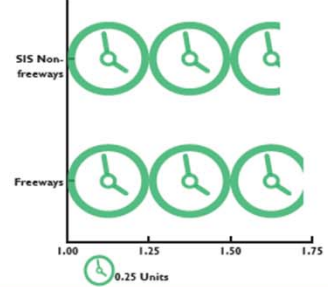
Daily Vehicle Miles Traveled



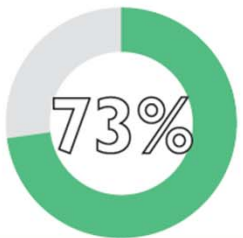
Percent Miles Heavily Congested



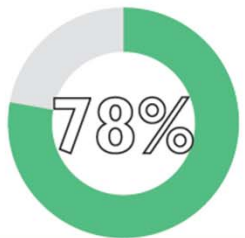
Travel Time Variability



Travel Time Reliability: SIS Non-freeways



Travel Time Reliability: Freeways



# Definitions

## FDOT Definitions

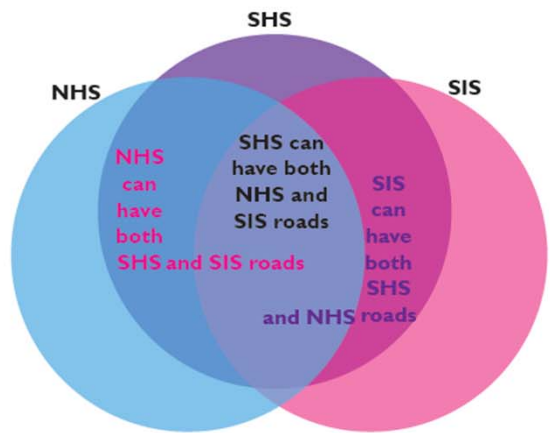


**Daily Vehicle Hours of Delay:** Delay is the product of directional hourly volume and the difference between travel time at "threshold" speeds and travel time at the average speed. The thresholds are based on LOS B as defined by FDOT.



**Heavy Congestion:** Heavy congestion is a situation in which average travel speeds are in the range from 20-44 mph for freeways and equal to or worse than the LOS standards for arterials and highways.

**Level of Service (LOS):** A quantitative stratification regarding the quality of service to a typical traveler of a service or facility into six letter grade levels, with "A" describing the highest quality and "F" describing the lowest quality.



**Travel Time Reliability:** Travel time reliability (TTR) metric for highways is the percentage of trips traveling at greater than or equal to 5 mph below the posted speed limit. TTR metric for arterials is the percentage of trips traveling greater than or equal to 20 mph. TTR metric for freeways within the seven largest MPO urbanized areas is the percentage of travel greater than or equal to 45 mph; for all other freeways, TTR is defined as the percentage of trips traveling at greater than or equal to 5 mph below the posted speed limit.



**Travel Time Variability:** Travel time variability is the 95th percentile travel time index, which is the 95th percentile travel time divided by free flow travel time.



**Truck Miles Traveled** (for all trucks class 4 through 12): The total number of miles traveled by trucks using a highway system.



**Vehicle Miles Traveled:** The total number of miles traveled by vehicles using a highway system.

Data Sources: FDOT Traffic Characteristics Inventory, FDOT Roadway Characteristics Inventory, and HERE vehicle probe speed



# Possible Future Activities

Feedback &  
Continued  
Support

Pilot Maps /  
Visualization



# Feedback

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CC:

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