

Incorporating Reliability Performance Measures in the Planning and Programming Processes

SHRP 2 Project L05

presented to

SHRP 2 L38 Information Session

presented by

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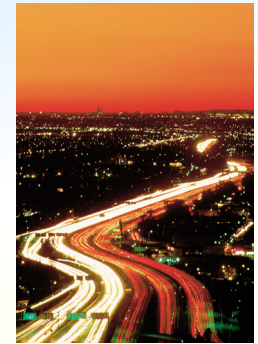
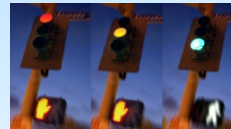
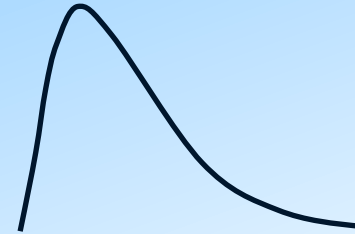
SHRP 2 L05 Objective

To develop the means—including technical procedures—for state DOTs and MPOs to fully integrate reliability performance measures and strategies into the transportation planning and programming processes.

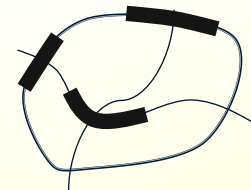
This will allow operational investments to be considered in planning and programming along with more traditional types of project investments (e.g., capacity expansion, travel demand management).

What is Reliability?

- ...Variability in travel time, over time
- ...Due to fluctuations in demand, traffic control devices, traffic incidents, inclement weather, work zones, and physical capacity
- ...Can be reported for a facility or trip for different time periods

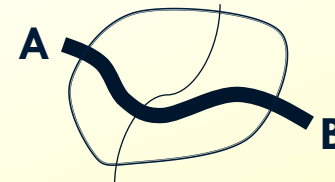


Facility



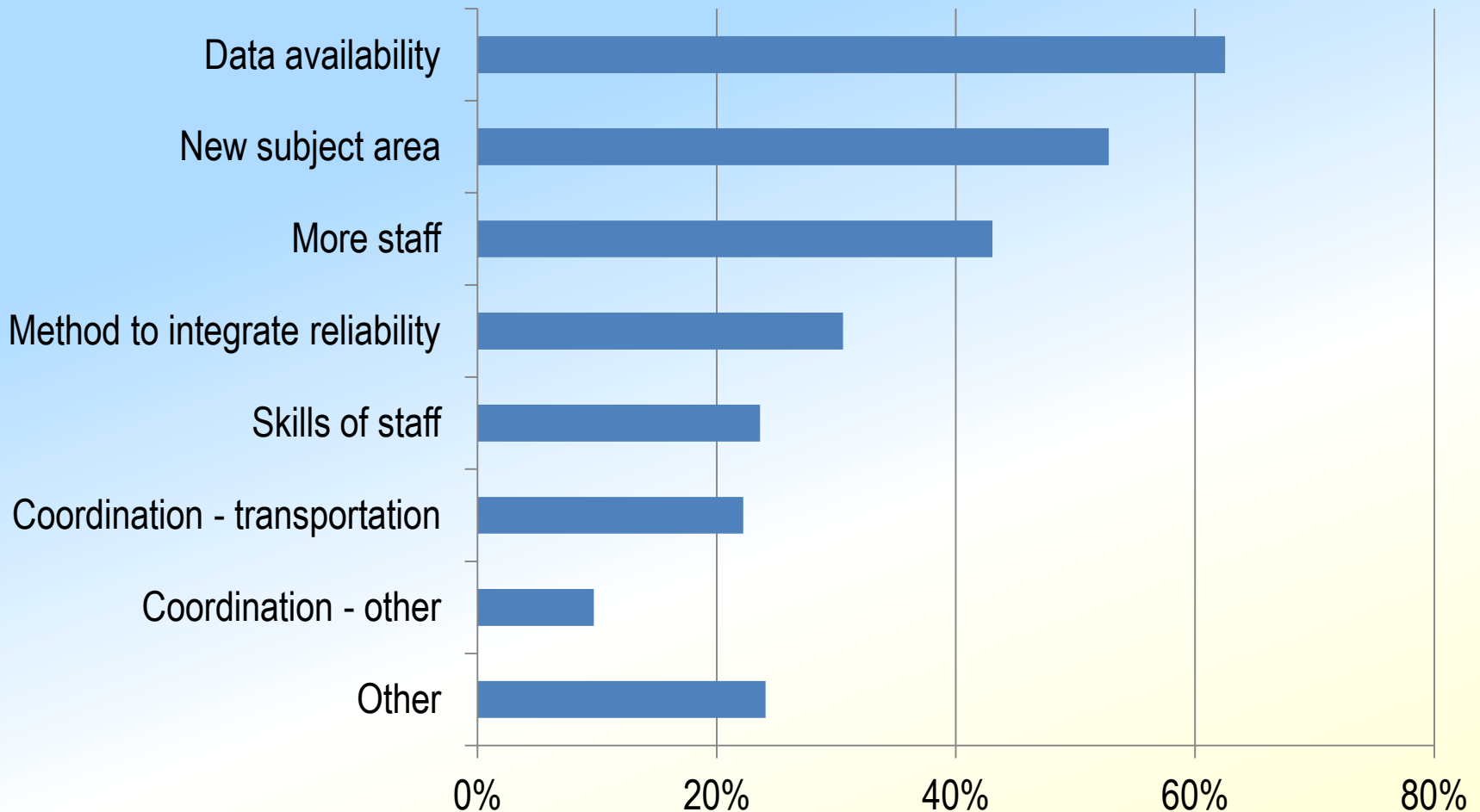
8-9am

Trip



7-10am

What are the Challenges for Incorporating Reliability into Planning?



Reference Guide for Incorporating Reliability into Planning and Programming

● The Reference Guide

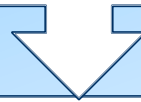
- » **Practical**. Address reliability in real world planning
- » **Accessible**. Find specific information to help make a specific decision
- » **Broad**. Cover both technical and communication issues
- » **Primary audience is managers**.

● The Technical Reference

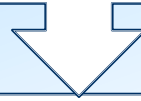
- » **Detailed**. Tools and data needed to calculate performance measures
- » **Easy to use**. Technical 'recipes' to evaluate reliability
- » **Primary audience is analysts**.

Reference Guide for Incorporating Reliability into Planning and Programming

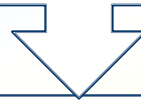
The traditional planning process does not address operations investments



Operations investments improve travel time reliability



Travel time reliability is a significant part of the customer experience



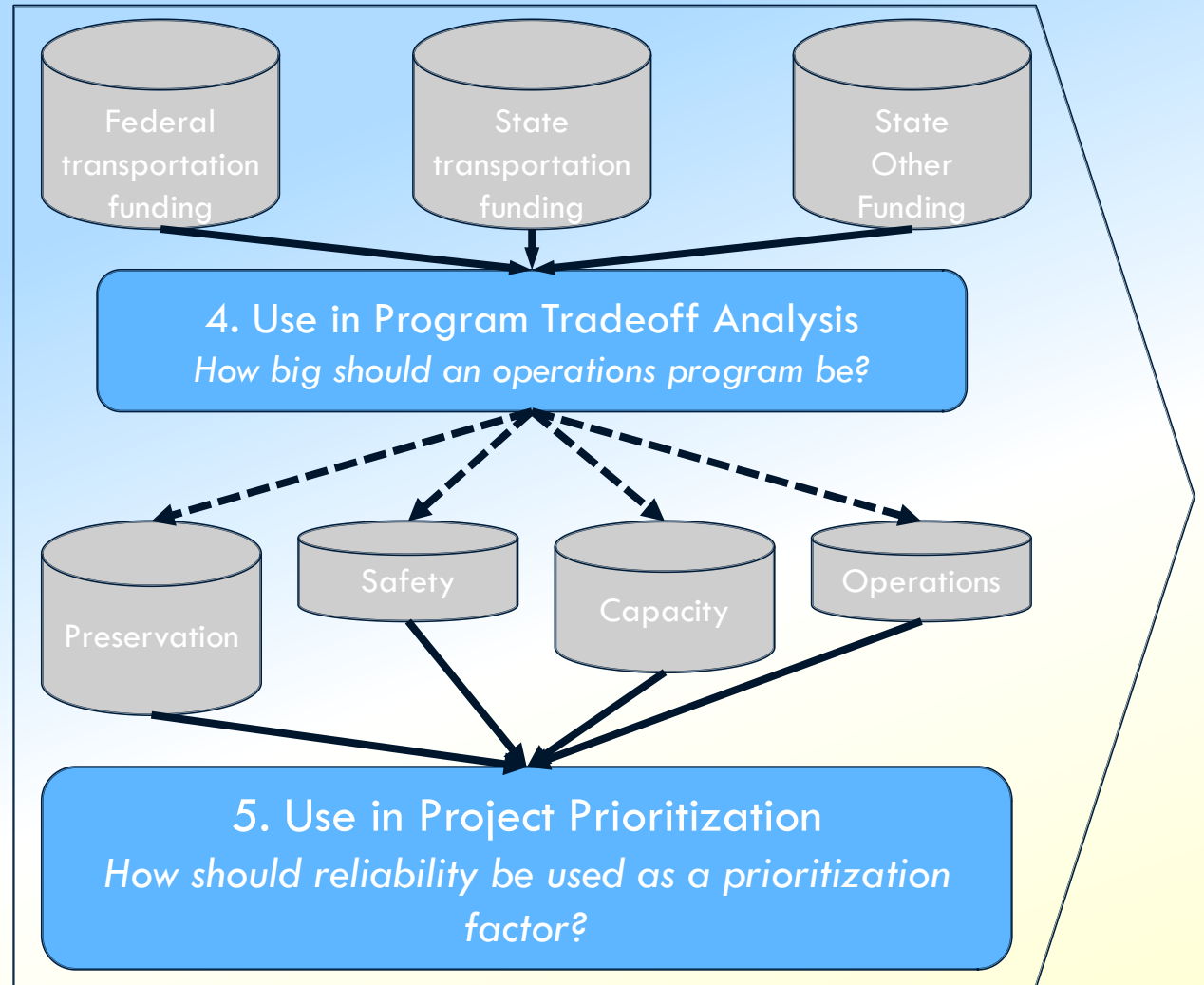
Including operations in the planning process will improve the customer experience. ← **The L05 Reference Guide Explains How To Do This**

Five Steps for Incorporating Reliability

1. Include in Policy statements

2. Select Performance Measures

3. Identify Needs and Deficiencies



Five Steps for Incorporating Reliability

- **Addressing reliability in policy statements**
- **Developing and tracking reliability measures**
- **Evaluating reliability needs and/or deficiencies**
- **Sizing funding for an operations program using reliability (and in consideration of program trade-offs)**
- **Prioritizing projects (operations, capacity, etc.) using reliability**

Five Steps for Incorporating Reliability

Policy Statements



A reliable, efficient, and well maintained transportation system.



Integrate investments for cost-effective solutions –

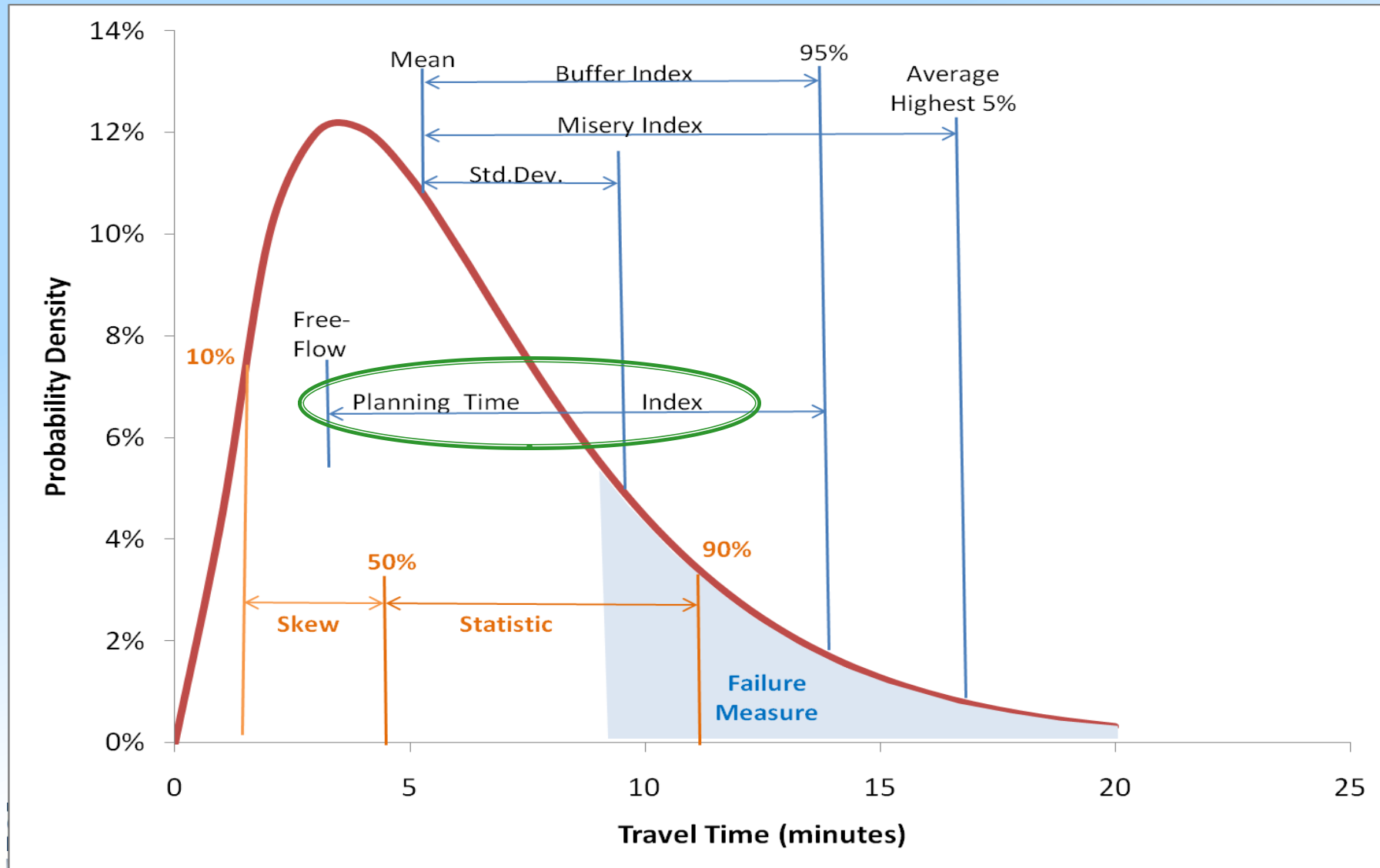
- Operate efficiently
- Manage demand
- Add capacity strategically



Deliver excellent customer service to people who travel in the Commonwealth, and to provide our nation's safest and most reliable transportation system in a way that strengthens our economy and quality of life.

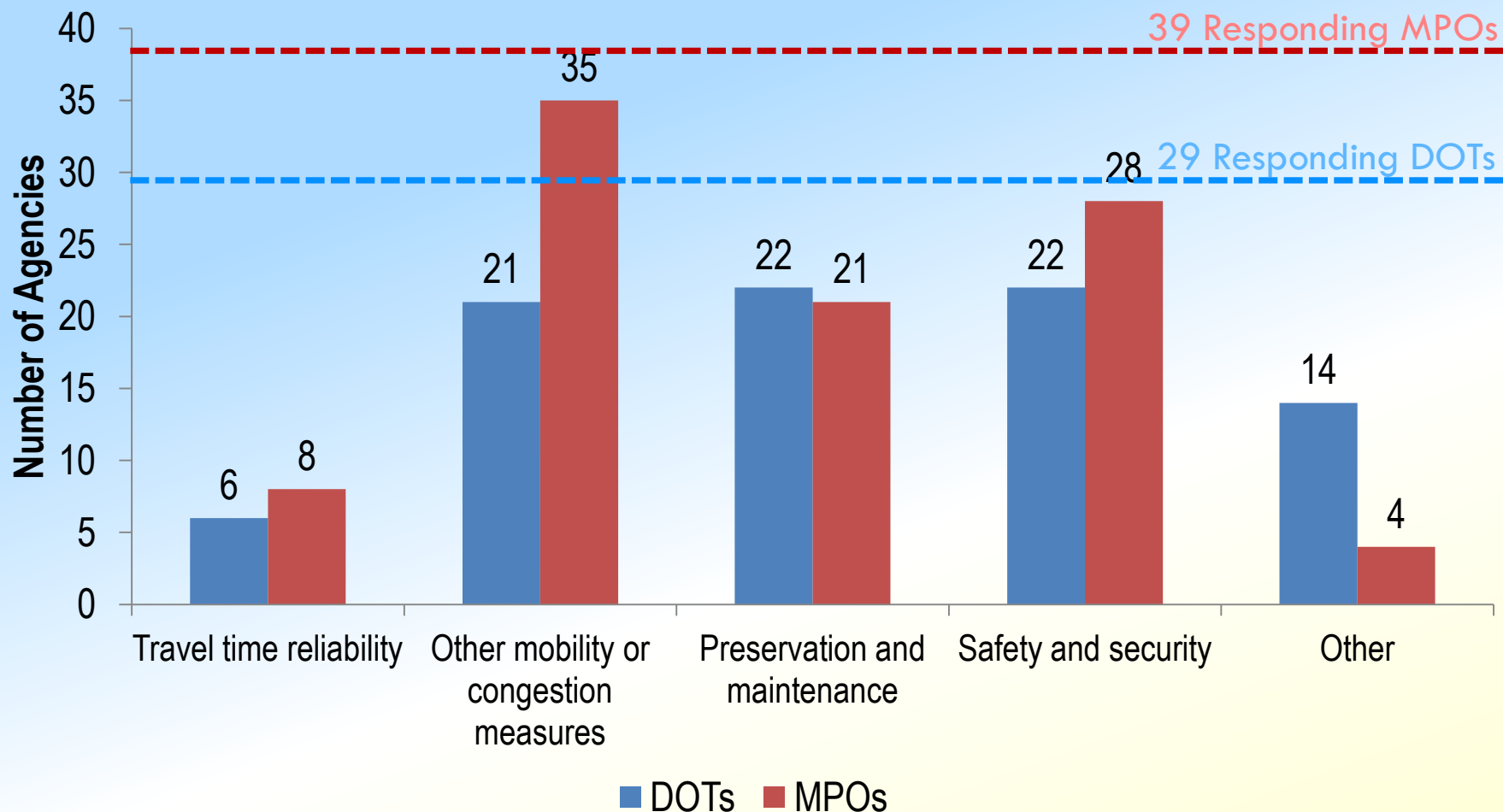
Five Steps for Incorporating Reliability

Tracking and Reporting Measures



Five Steps for Incorporating Reliability

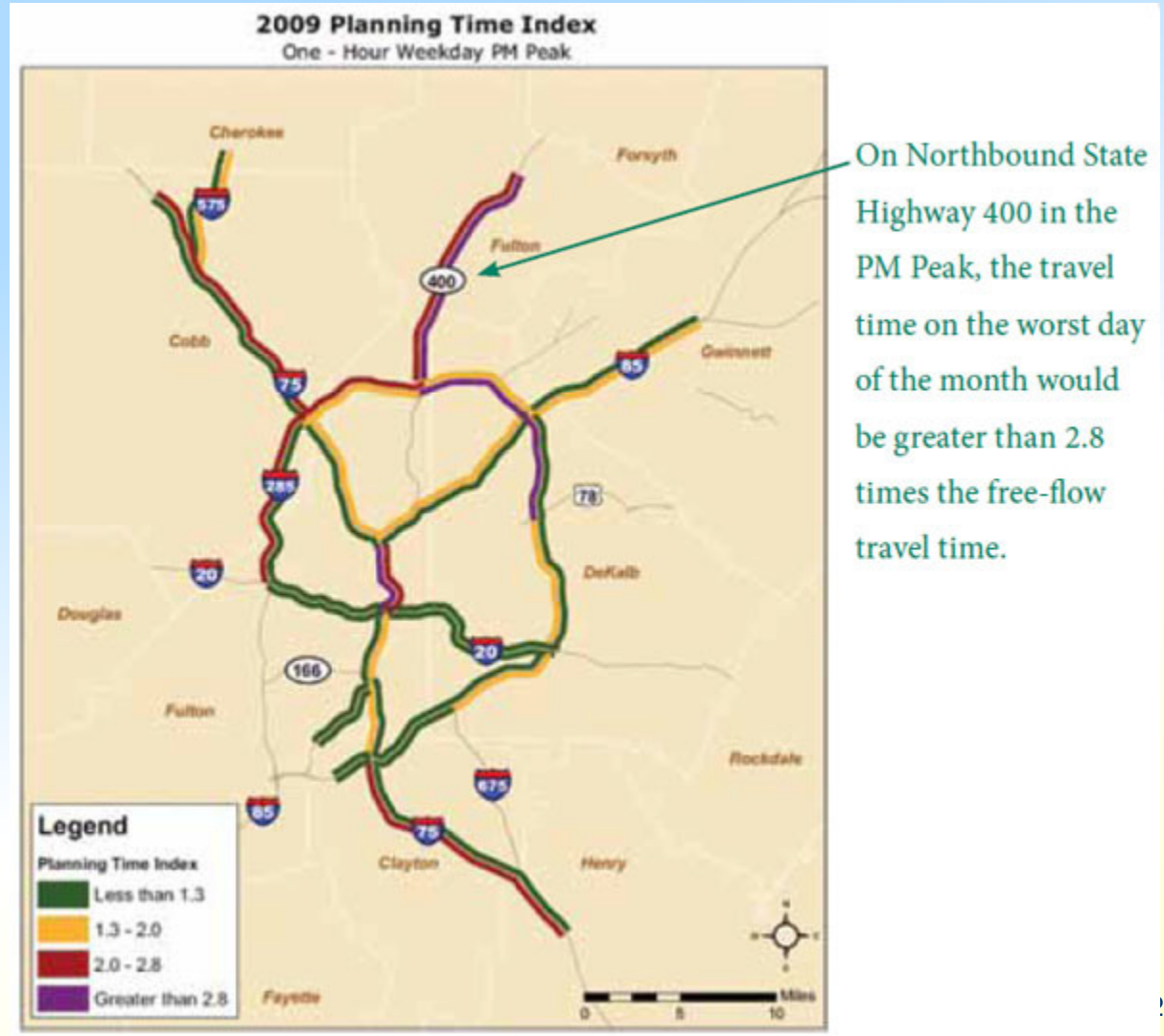
Tracking and Reporting Measures



Five Steps for Incorporating Reliability

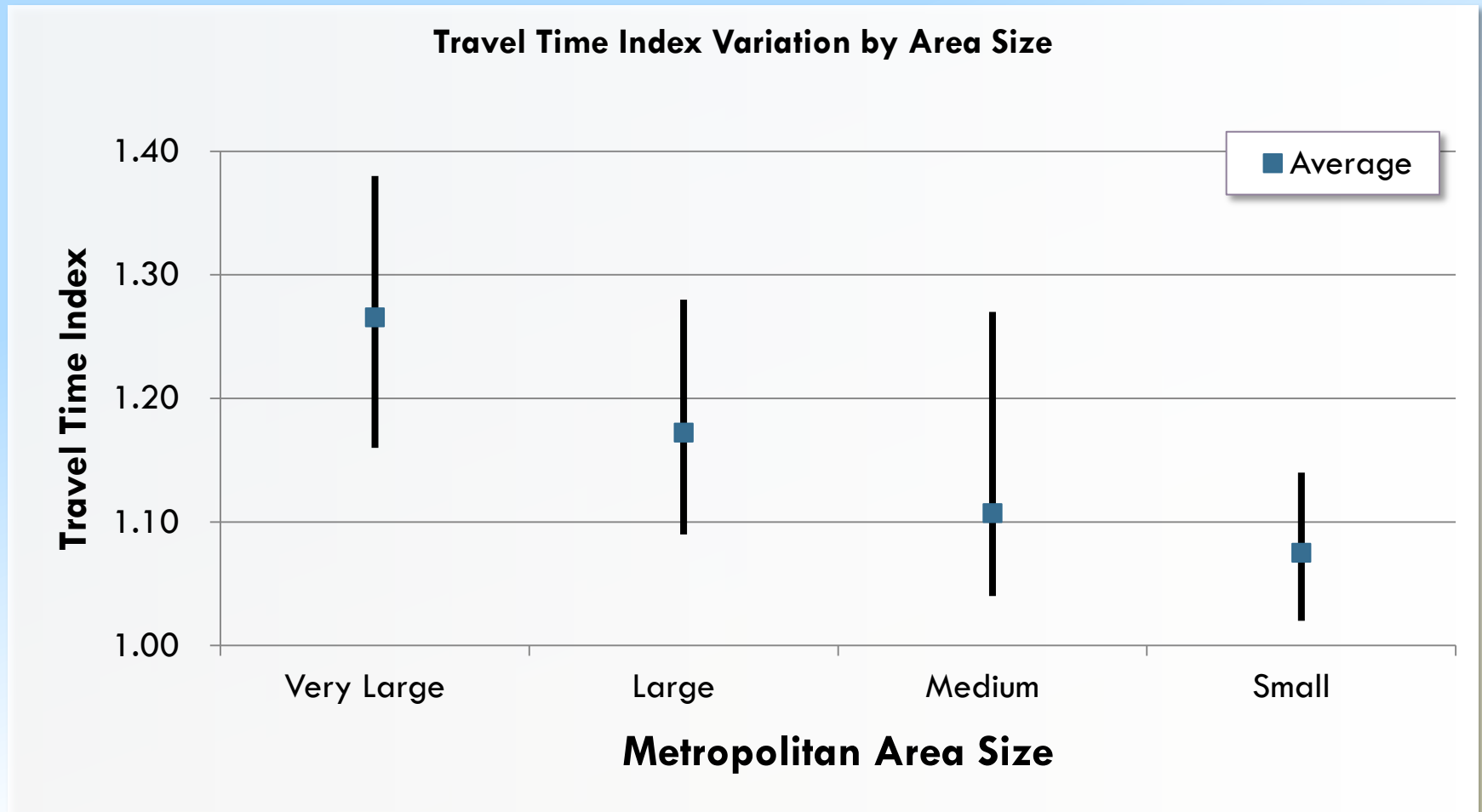
Needs and Deficiencies

- **Deficiency:** Any segment with a PTI of 2.0 or higher
- **Need:** The \$ to bring the segment to an acceptable PTI (2.0 or lower)



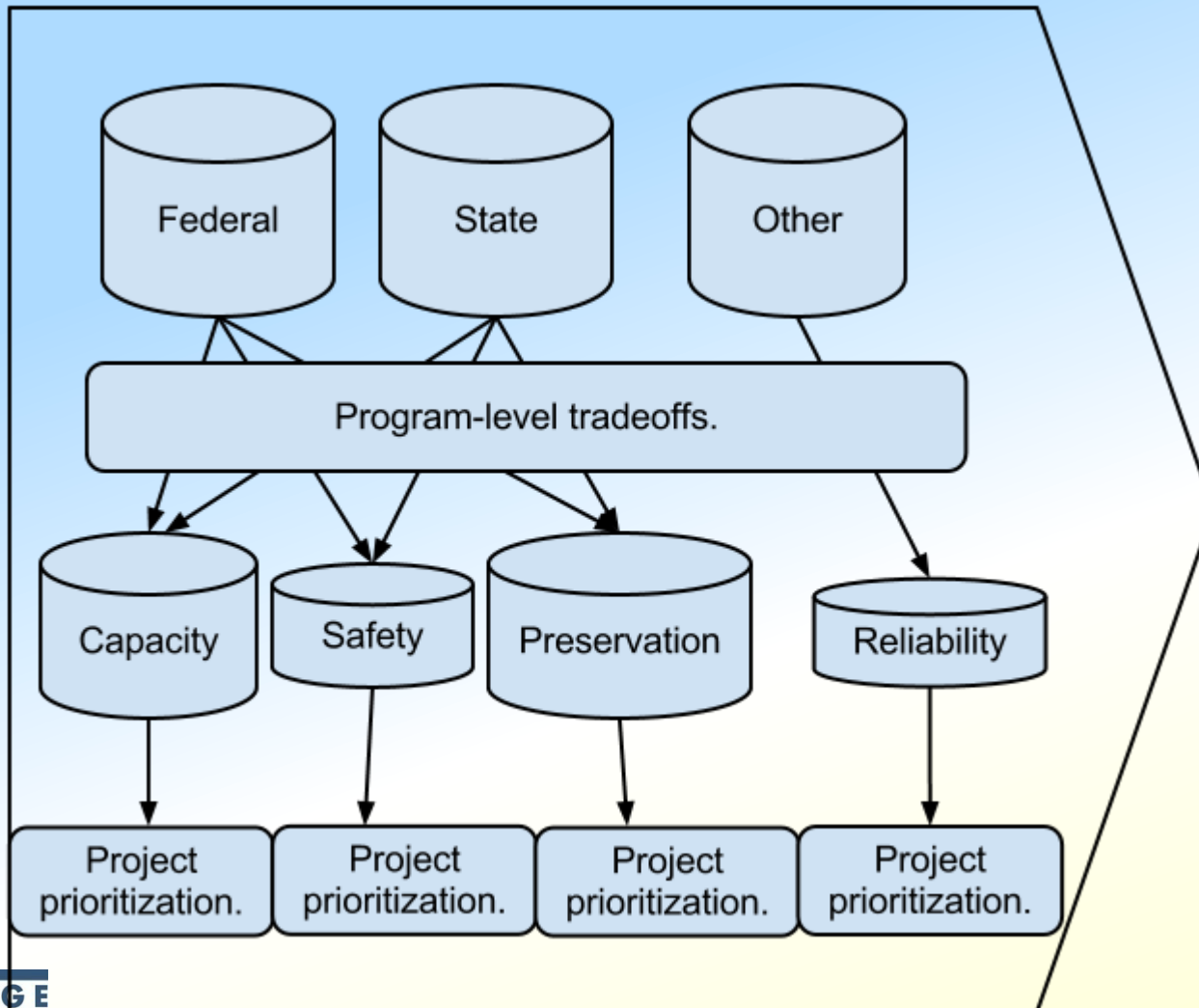
Five Steps for Incorporating Reliability

Needs and Deficiencies



Five Steps for Incorporating Reliability

Sizing an Operations Program



Five Steps for Incorporating Reliability

Sizing an Operations Program

**Operations
– reliability**

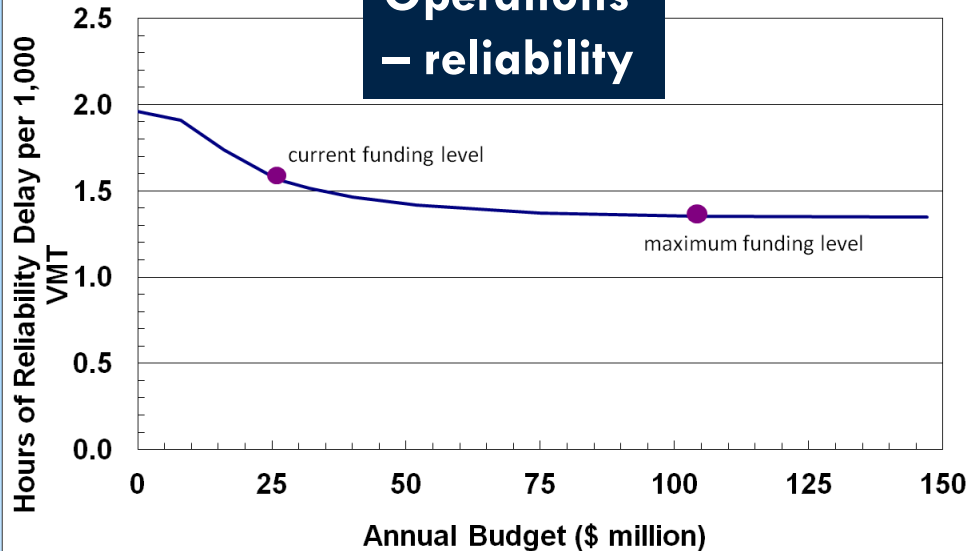
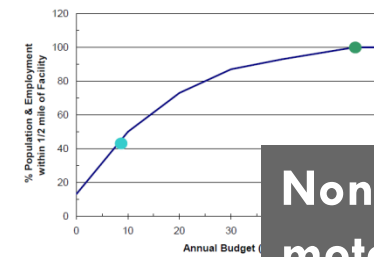
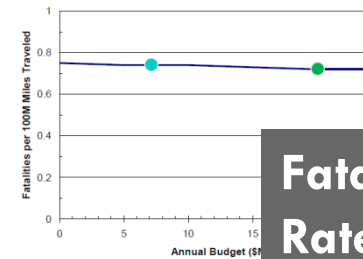


Figure 9. Nonmotorized Performance versus Funding



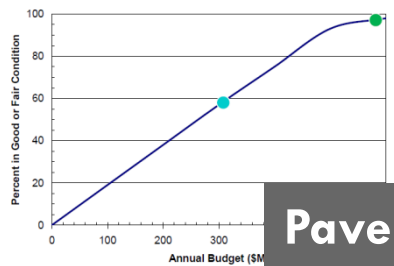
**Non-
motorized**

Figure 8. Fatality Rate versus Funding



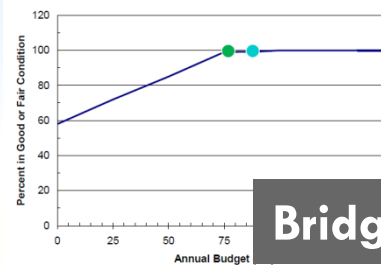
**Fatality
Rate**

Figure 5. Pavement Performance versus Funding



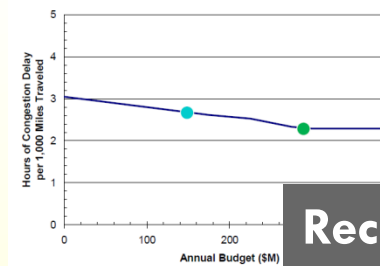
Pavement

Figure 6. Bridge Performance versus Funding



Bridge

Figure 7. Delay versus Funding



**Recurring
Delay**

Five Steps for Incorporating Reliability

Prioritizing Projects

Florida Strategic Investment Tool (SIT) will use reliability performance to make project decisions that support their Maintenance and Operations goal.

How do you get operations projects into the SIT?

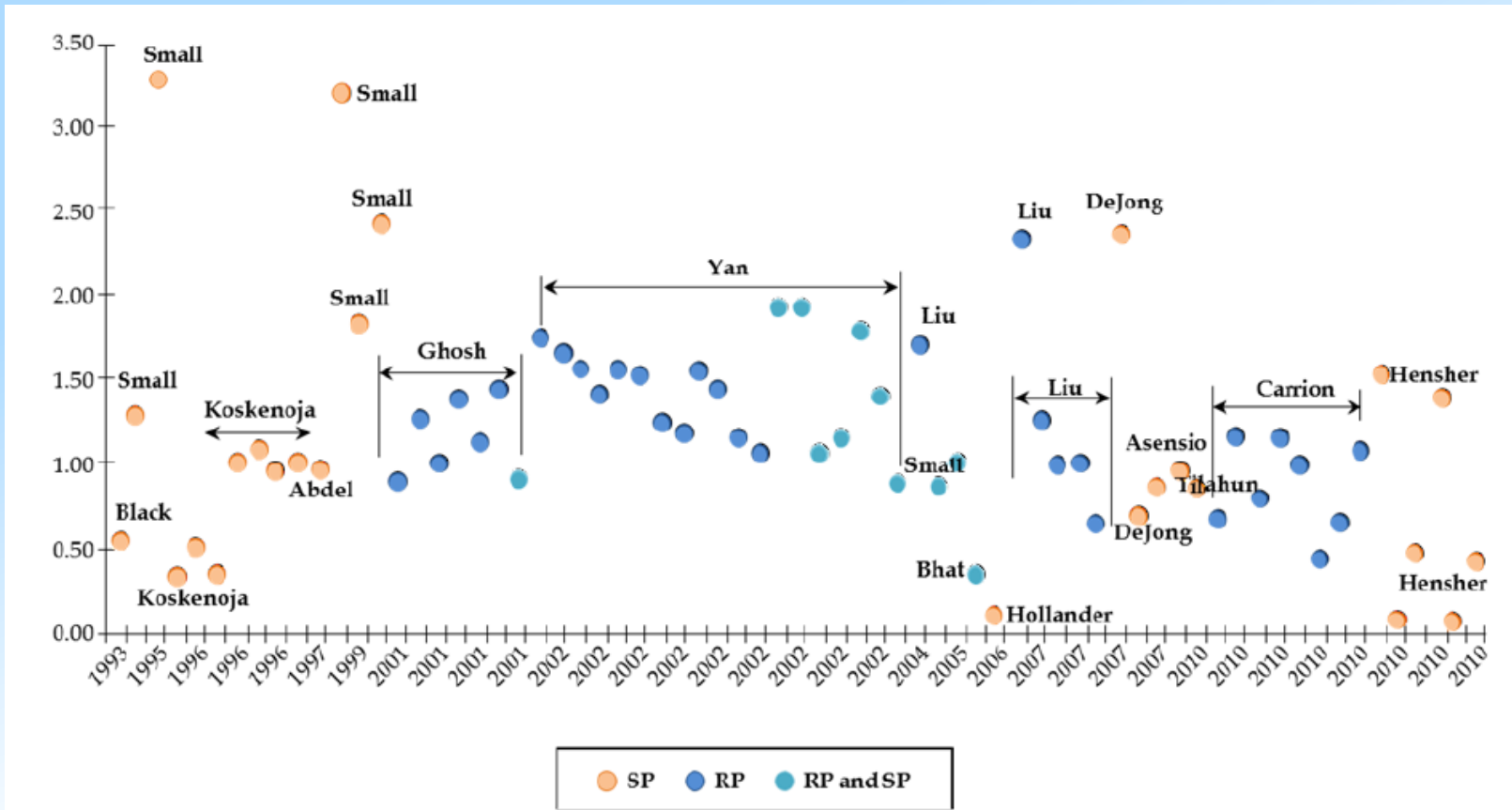
Reliability

Goal Measured	Measure	Maximum Score
Safety and Security	Crash Ratio	10
	Fatal Crash	4
	Bridge Appraisal Rating	3
	Link to Military Base	3
	<i>Possible Subtotal</i>	<i>20 points</i>
System Preservation	Volume /Capacity (v/c) Ratio	10
	Truck Volume (AADTT)	6
	Vehicular Volume (AADT)	2
	Bridge Condition Rating	2
	<i>Possible Subtotal</i>	<i>20 points</i>
Mobility	Connector Location	1
	Volume /Capacity (v/c) Ratio	4
	Truck Volume (% Trucks)	2
	Vehicular Volume (AADT)	2
	System Gap	2
	Change in v/c -LOS (for Mainline segments only)	3
	Interchange Operations (for Interchanges only)	
	Bottleneck/Grade Separation	2
	Delay	4
	<i>Possible Subtotal</i>	<i>20 points</i>
Economics	Demographic Preparedness	5
	Private Sector Robustness	5
	Tourism Intensity	5
	Supporting Facilities	5
	<i>Possible Subtotal</i>	<i>20 points</i>
Quality of Life	Land and Social Criteria	4
	Geology Criteria	4
	Habitat Criteria	4
	Water Criteria	8
	<i>Possible Subtotal</i>	<i>20 points</i>
Total Maximum Score		100 points

Five Key Steps for Incorporating Reliability

Prioritizing Projects

Ratio of Value of Reliability to Value of Average Travel Time



Source: Carrion and Levinson (2012)

Technical Reference Outline

- **Select an analysis approach**

- » Purpose of analysis
- » Available data and tools
- » Available resources (time, money, staff)

- **Select an analysis tool**

- **Determine if multiscenario analysis is needed**

- » If you need a more complete picture of causes of reliability issues and outcomes



Identify long term needs

- *Support goal setting*
- *A high-level, order of magnitude, understanding of future deficiencies*
- *For several scenarios*
- *Sensitive to operations projects*
- *Produce chosen measure (e.g. planning time index)*

Questions?