



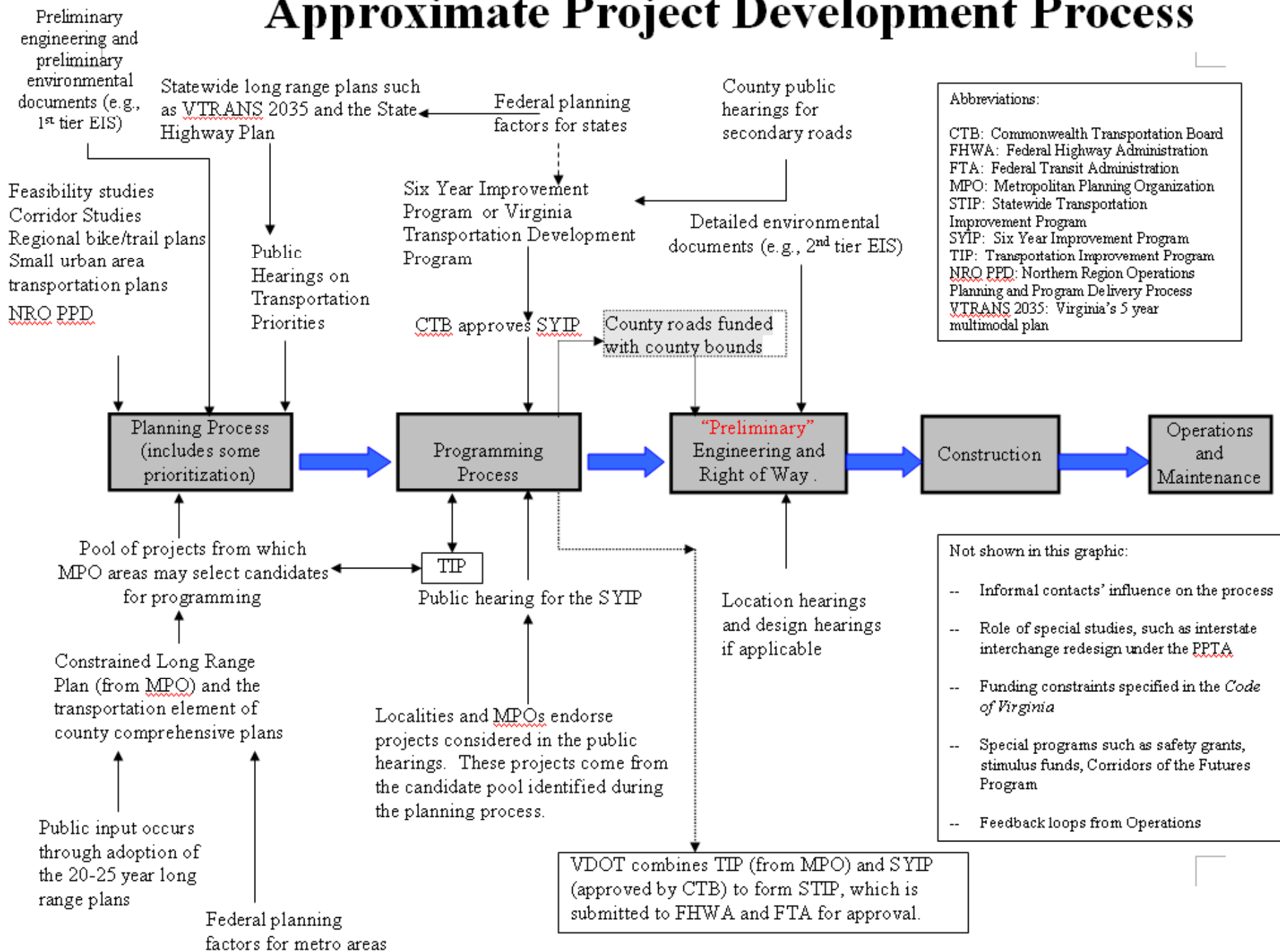
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Options for Considering Operational Improvements in the Planning Process

Thursday May 5, 2011

Approximate Project Development Process



Critiques of the Conventional Transportation Planning Process

- ❑ Accommodate processes vs. projects
- ❑ Include operations-related initiatives
- ❑ Emphasize performance measures vs. technologies
- ❑ Quantify benefits, even with limited data



A Few Performance are Better than None

- “Providing better information on benefits does not need to take major effort, and precise answers are not essential”

Dahlgren, J. and Lee, D.B., Jr. *Integrating ITS Alternatives into Investment Decisions in California*, Report UCB-ITS-PRR-2004-40, University of California, Berkeley, 2004.



Impact of Operational Investments

Initiative	Impact	Period
Ramp meters	<ul style="list-style-type: none"> Throughput decreases by 14% without metering 	One week
Automated weigh stations	<ul style="list-style-type: none"> 524,000 hours for drivers \$39 million in costs 	7 years
Transit signal priority	<ul style="list-style-type: none"> 2 to 3 minutes per route 17% reduction in travel time variability 	Not stated
	<ul style="list-style-type: none"> \$120,000 / route 	5 - 10 years
Travel info via website	<ul style="list-style-type: none"> Over a million visitors per month in some cases 	7.5 years

Coffman, M.T. and Makler, J. State of ITS: Telling the Intelligent Transportation Systems Success Story for Portland, Oregon, TRB 86th Annual Meeting, Compendium of Papers CD-ROM, Washington, D.C., 2007.



A Framework to Include Operations in the Planning Process: Disclaimers

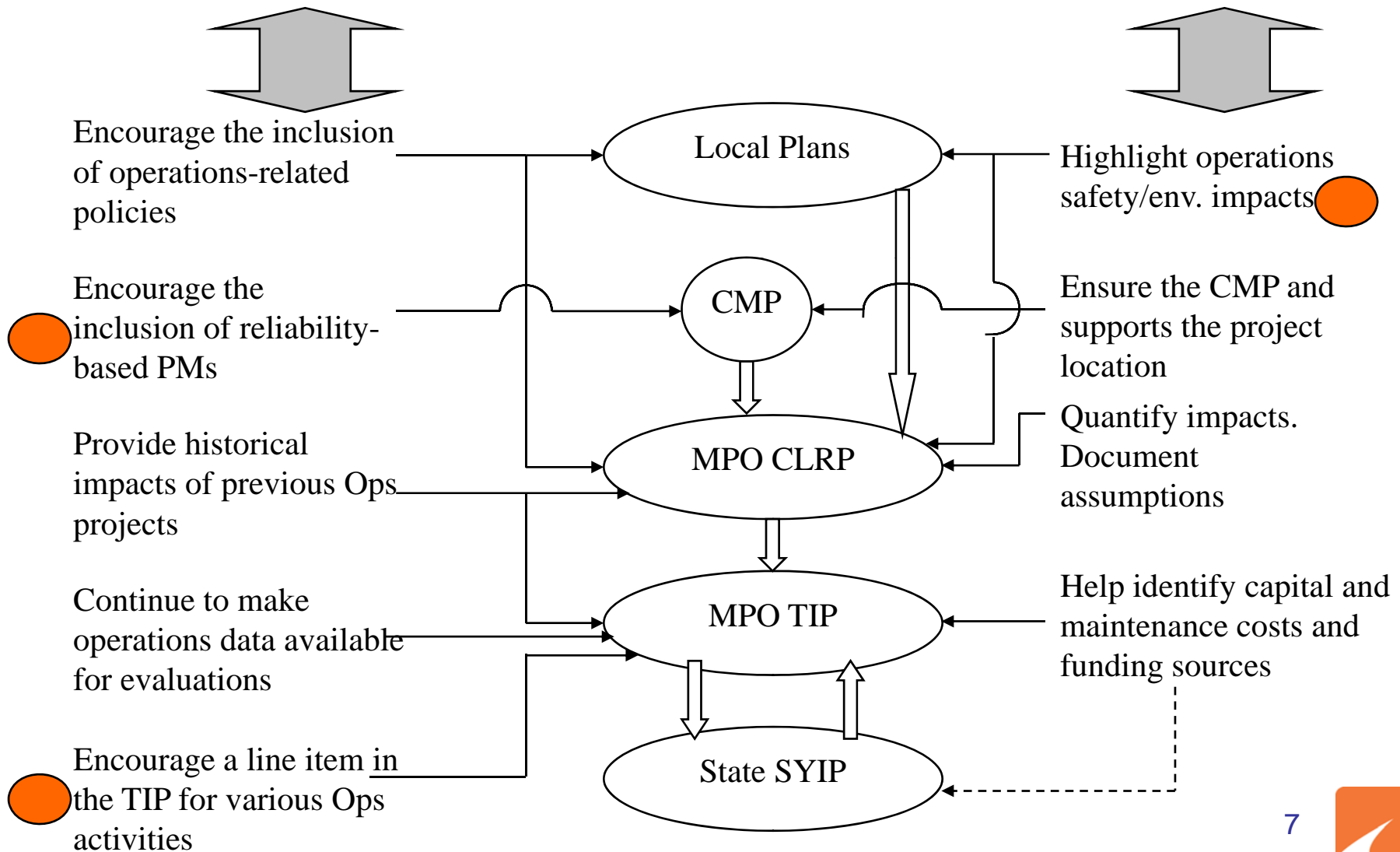
- A variety of initiatives are underway in Virginia and nationally. One example is the integration of the SYIP and the SYOIP.
- Many parallel planning processes exist at the local, MPO, and state levels
- There is not a sharp dividing line between planning, programming, and project development
- Graphics is not necessarily our forte.`



A Framework To Link Operations and Planning

Influence the Planning Process to Accommodate Operations

Fit Operations Initiatives into the Planning Process



Additional Opportunity 1

- Actively encourage the use of performance metrics that highlight the impacts of operational strategies
- Example: Lyman and Bertani (2008) noted different results when using the following indices to prioritize corridors



Two Indices Given Different Results

- Buffer index $\frac{95\text{th percentile travel time}}{\text{average travel time}}$
- Travel Time index $\frac{\text{peak travel time}}{\text{free flow travel time}}$
- Both indices measure something important but they measure different travel dimensions
- One captures reliability to a greater degree

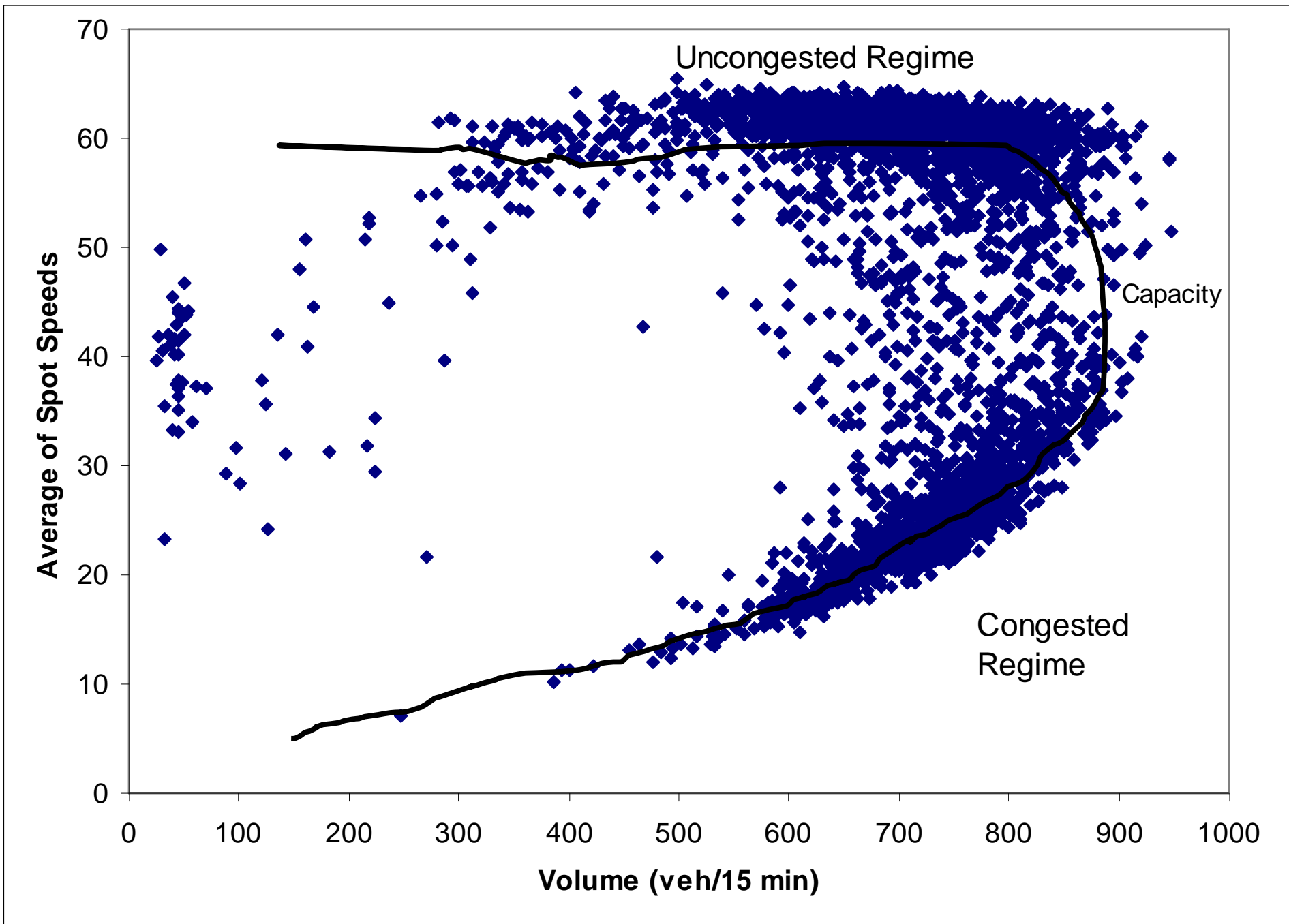


Examples of Performance Measures

Measure	Value
Buffer index	2.34
Regional planning index	1.34
Travel time index	1.15
Total vehicle hours of delay	63,380
Average vehicle minutes of delay	1.93
Number of congested flow periods	1,087
Number of periods with stop and go conditions	1,369
Average duration of stop and go conditions	59 min

I-66 West Near mile marker 72



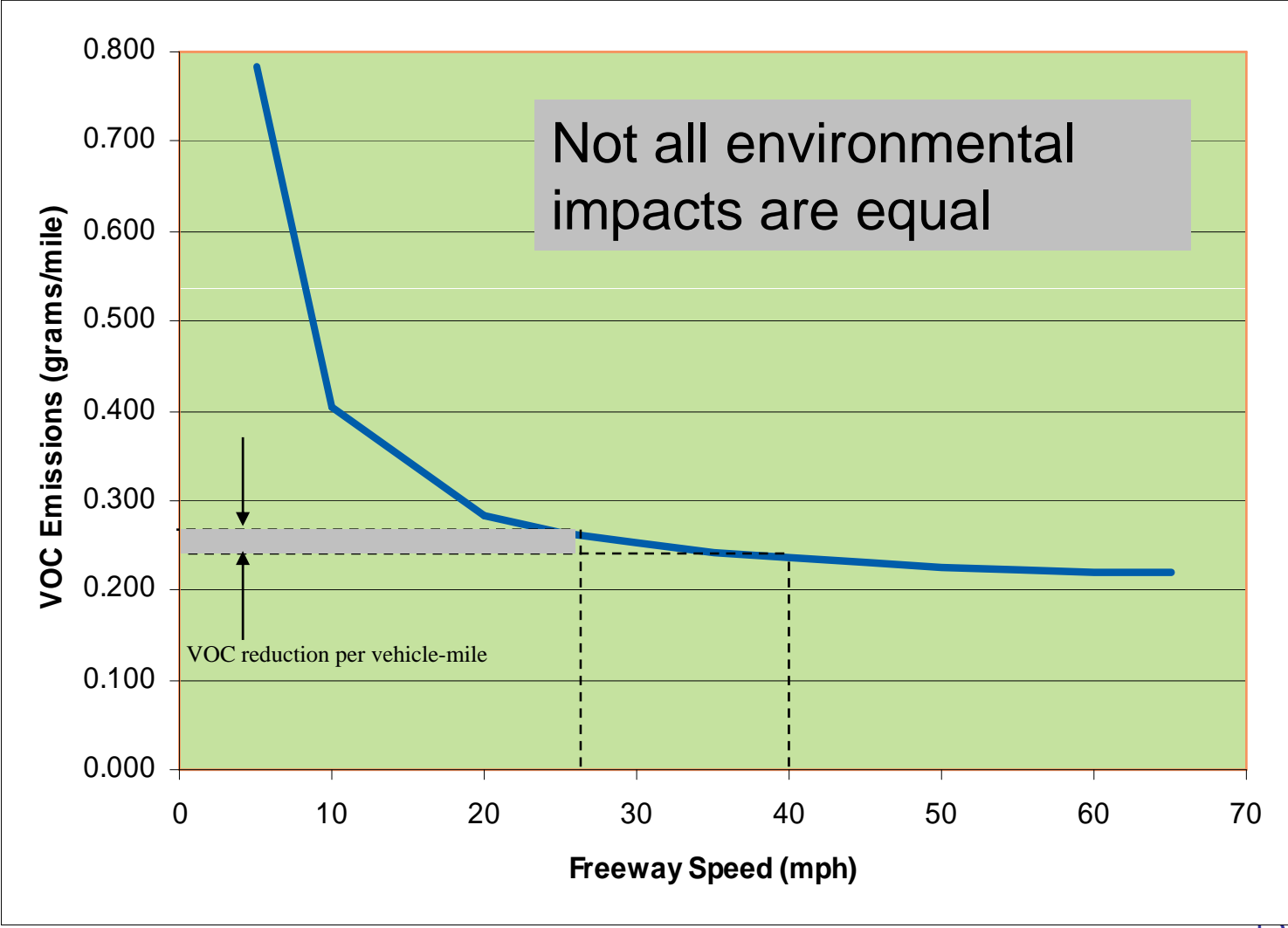


Additional Opportunity 2

- Quantify environmental and safety impacts, which may
 - Help identify funding sources
 - Build support for improvements
- Example: suppose technologies could result in an increase in speeds which would reduce VOC emissions



VOC Reductions based on Increased Speeds



Potential Safety Impacts of VSL

- Literature suggests VSL may reduce crashes by
 - 33% (PDO)
 - 10% to 30% (injury)
- 56 rear-end crashes over a 3 year period for a section of I-66 WB during noon-8 pm

MP
70



MP
74



Potential Safety Impacts of VSL

Crash Type	PDO	Injury
Annual Crashes	13.67	5.00
Potential Crash Reduction	4.51	1.00
Monetized Reduction	\$29,315	\$48,200
Include in a benefit-cost ratio?	Yes	No



Reporting the Safety Impacts of VSL

- Sketch planning estimates suggest that VSL may eliminate about 14 PDO crashes per year which has a monetized value of approximately \$30,000.
- Sketch planning estimates suggest that VSL may eliminate 1 injury crash per year.
- A fatal crash was excluded because:_____



Operational Policies May be Included Local Plans

- Local objective
 - Maximize the operational efficiency of transportation facilities.
- Local policy
 - Maximize the efficiency of existing roads through low-cost strategies to increase capacity...while avoiding negative impacts on pedestrians and bicyclists.



Summary

- Best practices for linking planning and operations include
 - Explicitly mentioning these in the TIP, CLRP, and other related planning documents (e.g., CMP)
 - Encouraging the use of reliability-based performance measures such as the buffer index
- Many MPOs in Virginia and elsewhere are indeed using or considering these approaches
- The challenge is making estimation of these impacts for operational initiatives routine through the use of sketch planning methods

