

Performance-Based Planning and Programming

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September 17, 2013

2013 WVDOT/MPO/FHWA
PLANNING CONFERENCE

Overview

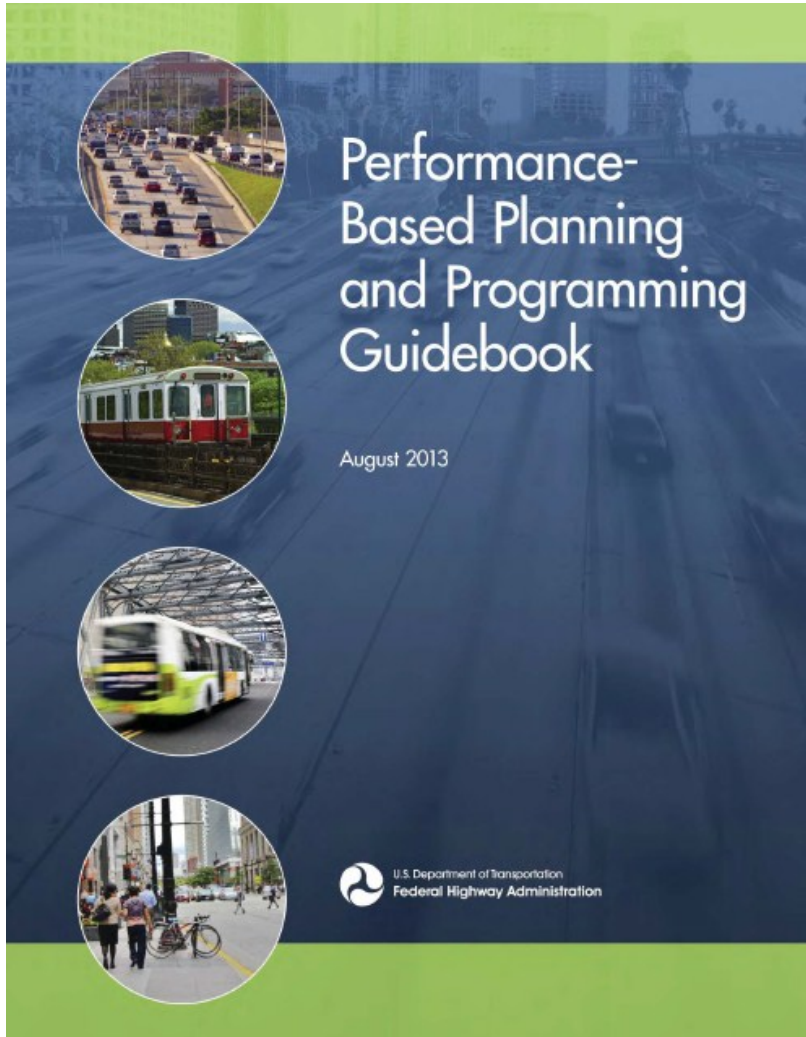
- MAP-21 Requirements
 - Planning
 - Performance Measures
 - Asset Management
 - Next steps
- SHRP2
- Questions

MAP-21 Requirements

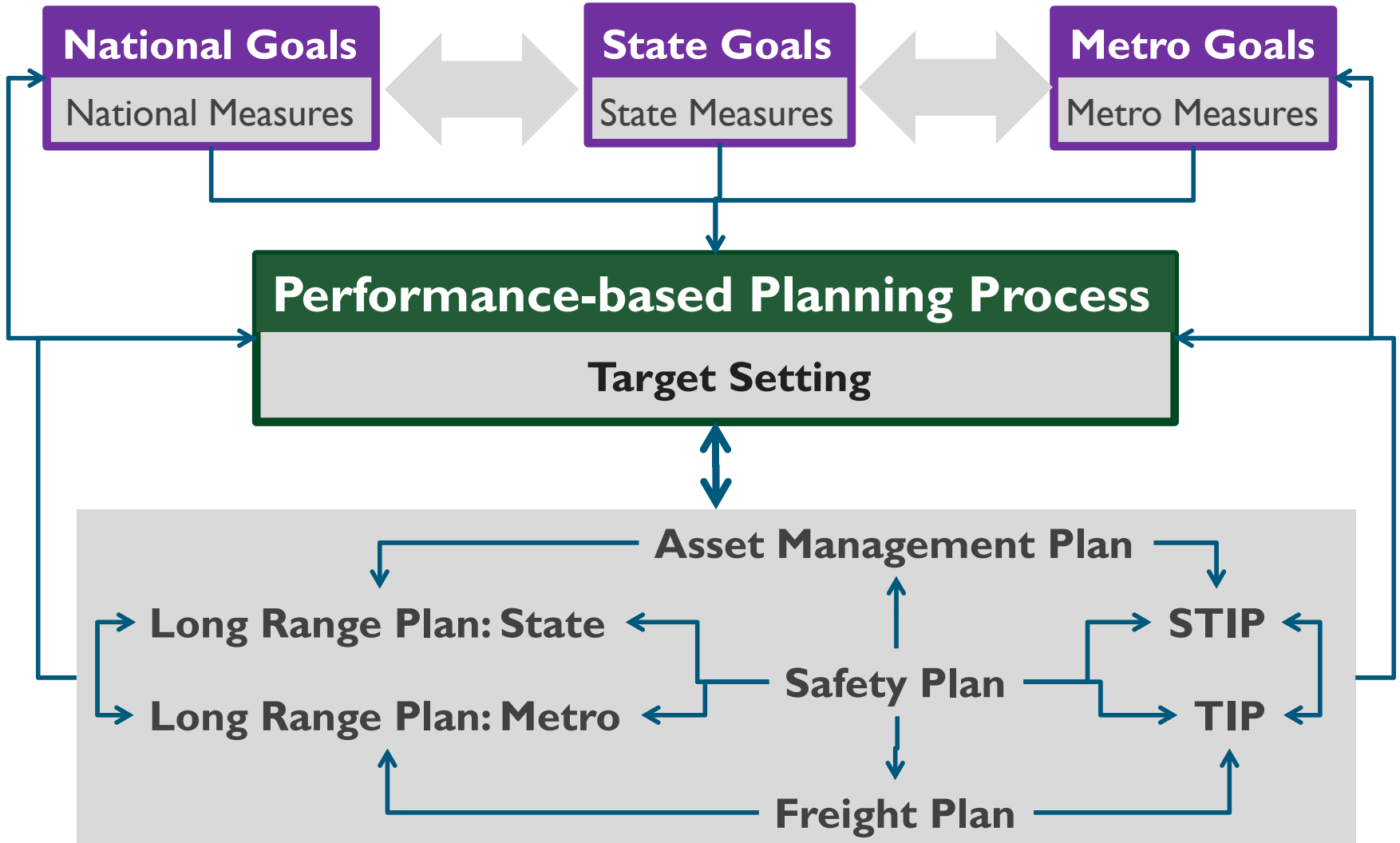
MAP-21 and PBPP

- PBPP principles are part of LRP and S/TIP
 - LRP describes performance measures and targets, achievement in reaching target
 - S/TIP must show progress toward established performance targets
- U.S. DOT establishes criteria for the evaluation of performance-based planning processes
- U.S. DOT establishes national-level performance measures

U.S. DOT Resources



PBPP in Context



National-level Measures

Overarching Principles

1. **There is a Difference**—National-level performance measures are not necessarily the same performance measures State DOTs will use for planning and programming of transportation projects and funding.
2. **Specificity and Simplicity**—National-level performance measures should follow the SMART and KISS principles:
 - SMART: Specific, Measurable, Attainable, Realistic, Timely
 - KISS: Keep it Short and Simple
3. **Possession is 9/10ths of the Law**—National-level performance measures should focus on areas and assets that States DOTs have control over.

Overarching Principles (cont.)

- 4. Reduce and Re-use**—The initial set of national-level performance measures should build upon existing performance measures, management practices, data sets and reporting processes.
- 5. Ever Forward**—National-level measures should be forward thinking to allow continued improvement over time.
- 6. Communicate, Communicate, Communicate**—Messaging the impact and meaning of the national-level measures to the public and other audiences is vital to the success of this initiative.

Safety

Recommended Measures



- **Number of Fatalities**—Five-year moving average of the count of the number of fatalities on all public roads for a calendar year.
- **Fatality Rate**—Five-year moving average of the Number of Fatalities divided by the Vehicle Miles Traveled (VMT) for a calendar year.
- **Number of Serious Injuries**—Five-year moving average of the count of the number of serious injuries on all public roads for a calendar year.
- **Serious Injury Rate**—Five-year moving average of the Number of Serious Injuries divided by the Vehicle Miles Traveled (VMT) for a calendar year.

Pavement Recommended Measures



- **Interstate Pavement in Good, Fair and Poor Condition based on the International Roughness Index (IRI)**— Percentage of 0.1 mile segments of Interstate pavement mileage in good, fair and poor condition based on the following criteria: good if $IRI < 95$, fair if IRI is between 95 and 170, and poor if IRI is greater than 170.
- **Non-Interstate NHS Pavement in Good, Fair and Poor Condition based on the International Roughness Index (IRI)**— Percentage of .1 mile segments of non- Interstate NHS pavement mileage in good, fair and poor condition based on the following criteria: good if $IRI < 95$, fair if IRI is between 95 and 170, and poor if IRI is greater than 170.
- **Pavement Structural Health Index**—Percentage of pavement which meet minimum criteria for pavement faulting, rutting and cracking.

Bridge

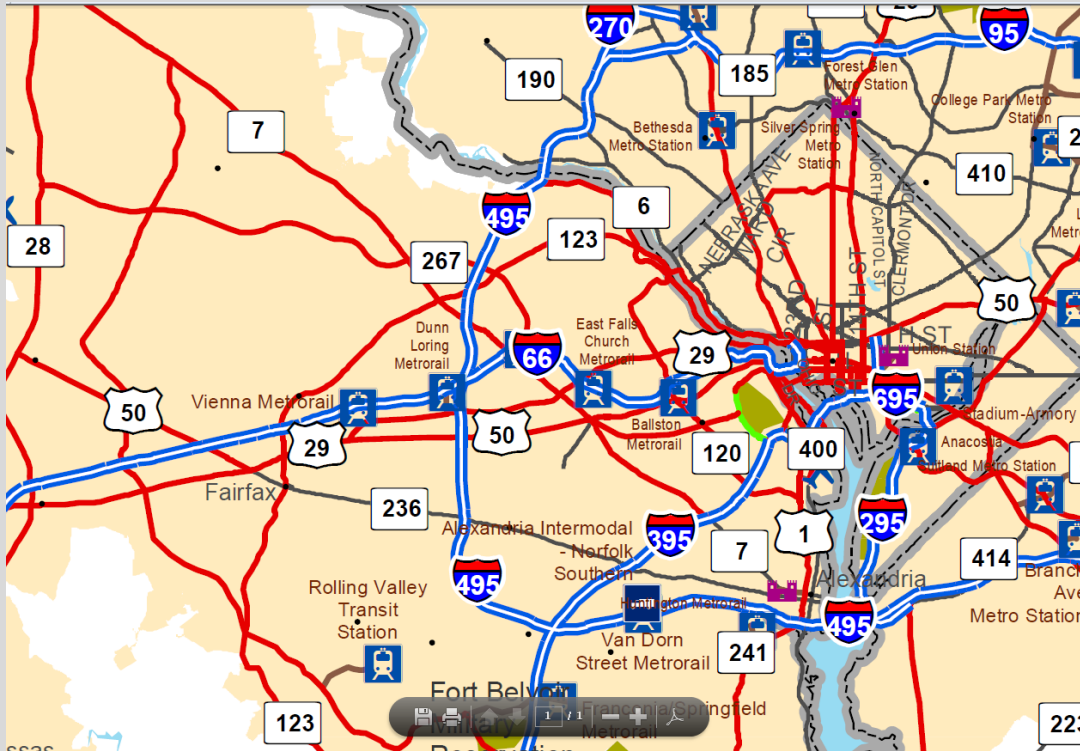
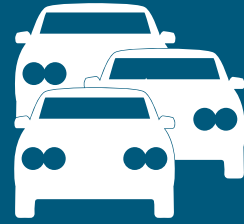
Recommended Measures



- **Percent of Deck Area on Structurally Deficient Bridges**—NHS bridge deck area on structurally deficient bridges as a percentage of total NHS bridge deck area.
- **NHS Bridges in Good, Fair and Poor Condition based on Deck Area**—Percentage of National Highway System bridges in good, fair and poor condition, weighted by deck area.

The first measure is required in MAP-21 and AASHTO supports this as an initial measure. However, this measure could steer a State DOT to implement a worst-first approach for maintaining bridge condition. Therefore, AASHTO is exploring the second measure.

System Performance Interstate and NHS

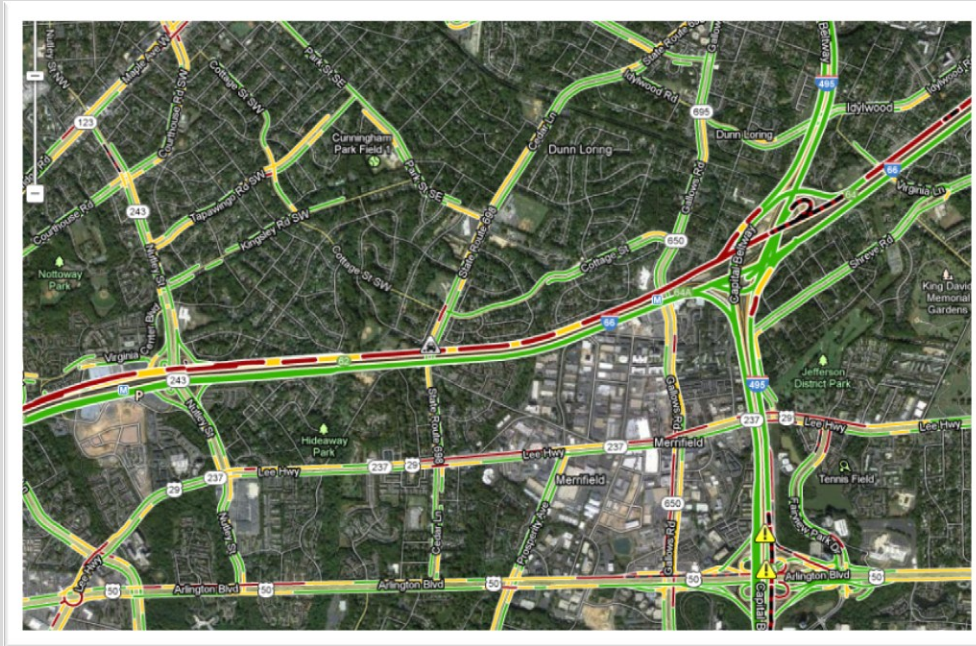
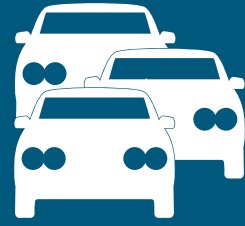


Where must measures be established?

1. Performance of the Interstate System
<double blue line>
2. Performance of the National Highway System (excluding the Interstate System)
<red line>

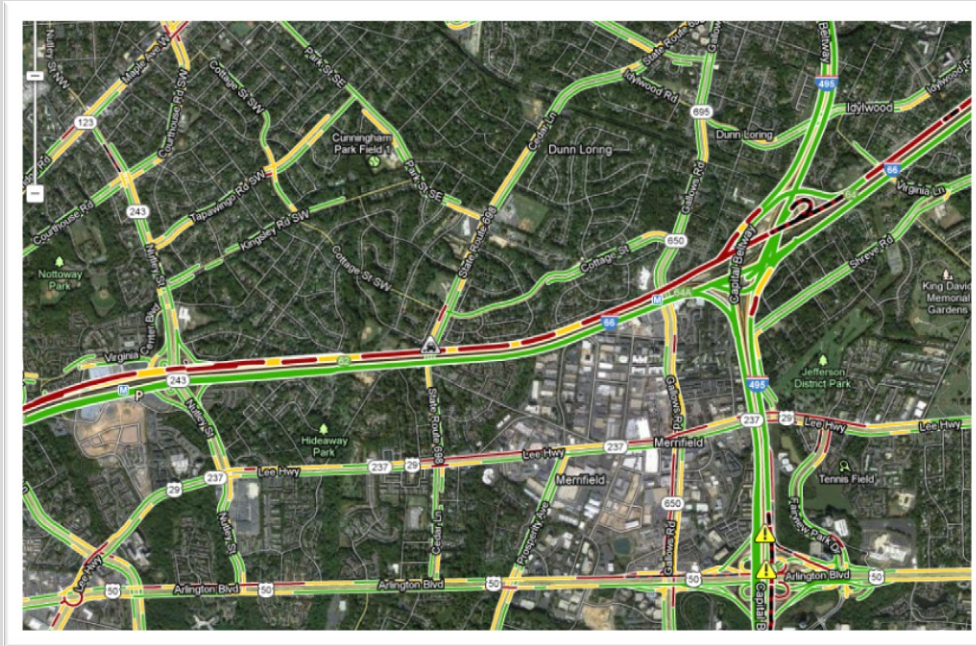
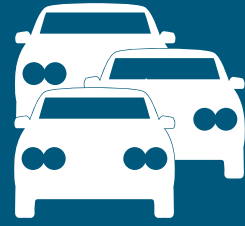
System Performance

Virginia: Interstates (I-66)



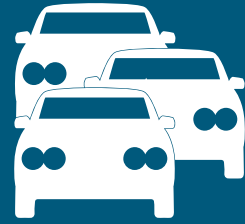
System Performance

Virginia: NHS (Route 50)



System Performance

Virginia: Arterials



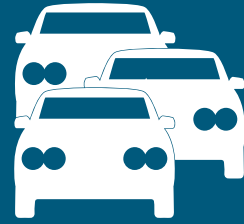
Columbia Pike: Fairfax, VA
Posted Speed Limit: 40 MPH
Design Speed: 50 MPH
Land Use: Low Density



Columbia Pike: Arlington, VA
Posted Speed Limit: 25 MPH
Design Speed: 35 MPH
Land Use: Medium Density

System Performance

Recommended Measures



- **Annual Hours of Delay (AHD)**—Travel time above a congestion threshold (defined by State DOTs and MPOs) in units of vehicle -hours of delay on Interstate and NHS corridors.
- **Reliability Index (RI_{80})**—The Reliability Index is defined as the ratio of the 80th percentile travel time to the agency-determined threshold travel time.

Freight Recommended Measures

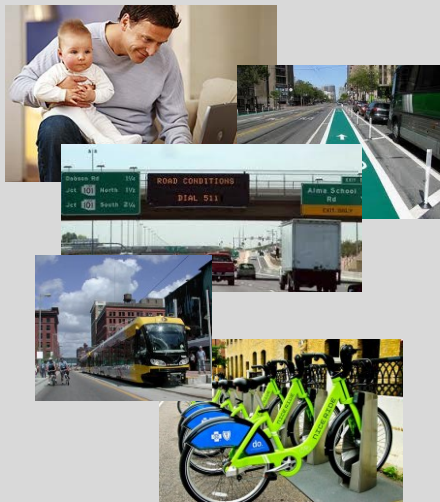


- **Annual Hours of Truck Delay (AHTD)**—Travel time above the congestion threshold in units of vehicle-hours for trucks on the Interstate Highway System.
- **Truck Reliability Index (RI_{80})**—The RI is defined as the ratio of the 80th percentile total truck travel time needed to ensure on-time arrival to the agency-determined threshold travel time (e.g., observed travel time or preferred travel time).

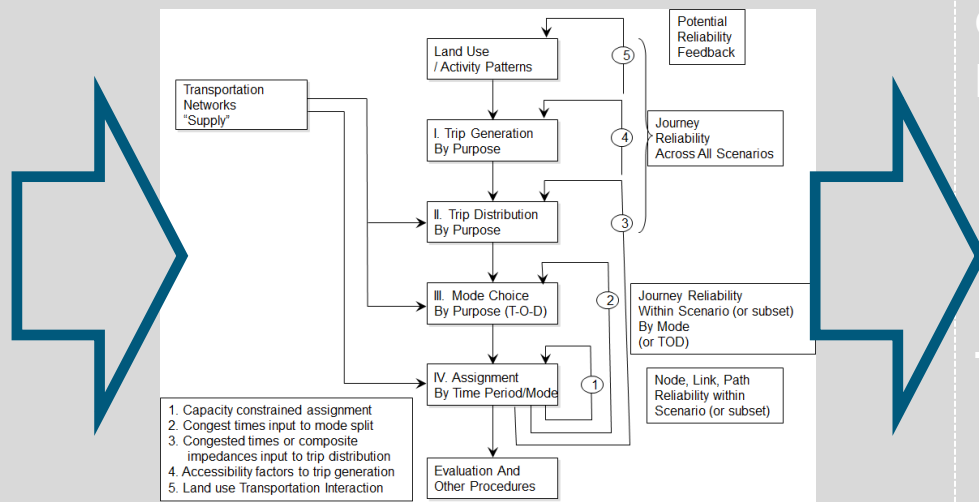


For purposes of carrying out section 149, the Secretary shall establish measures for States to use to assess:

1. Traffic Congestion
2. On-Road Mobile Source Emissions



CMAQ
Programs & Projects



Transportation Model

Criteria Pollutant Emissions

- VOC
- Nox
- PM
- CO

Traffic Congestion

- Annual Hours of Delay

Performance Measures



- **On-road Mobile Source Emissions**

- **Criteria Pollutant Emissions**—Daily kilograms of on-road, mobile source criteria air pollutants (VOC, NO_x, PM, CO) reduced by the latest annual program of CMAQ projects.

- **Traffic Congestion**

- **Annual Hours of Delay (AHD)**—Travel time above a congestion threshold (defined by State DOTs and MPOs) in units of vehicle -hours of delay reduced by the latest annual program of CMAQ projects.

These measures apply only to MPOs that serve Transportation Management Areas (TMAs) with populations of over 1,000,000 and that are nonattainment or maintenance areas.

TAM and Kentucky



Transportation Asset Management

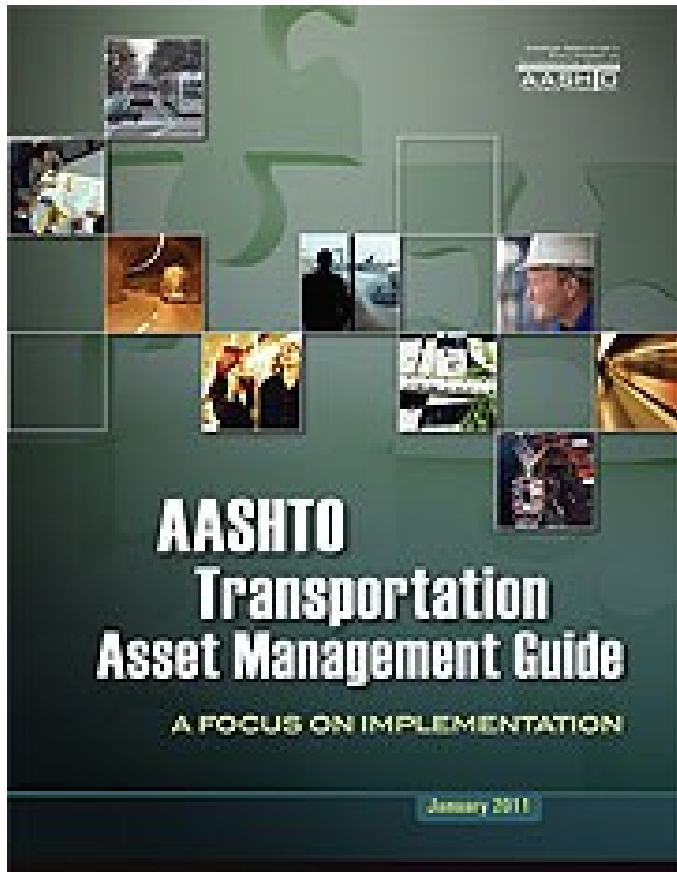
- MAP-21 Definition

“A strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their lifecycle. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision making based upon quality information and well-defined objectives”

- Risk-based Asset Management Plans

- Bridge and Roadway Condition
- Financial Plan
- Etc.

Why is TAM Important?



- Focus on accountability and transparency, as evidenced by MAP-21
- Funding competition
- Needs
- Demand
- Complex trade-offs

**USDOT Implementation of MAP-21 Performance Provisions:
Nine Interrelated Rules**

Planning

Metropolitan and Statewide Planning Rule	<ul style="list-style-type: none"> Establish a performance-based planning process at metropolitan and state level. Define coordination in the selection of targets, linking planning and programming to performance targets.
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Highway Safety

Safety Performance Measure Rule	<ul style="list-style-type: none"> Propose and define fatalities and serious injuries measures, along with target establishment, progress assessment and reporting requirements. Discuss the implementation of MAP-21 performance requirements.
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Highway Safety Improvement Program (HSIP) Rule	<ul style="list-style-type: none"> Integration of performance measures, targets, and reporting requirements into the HSIP. Strategic Highway Safety Plan updates.
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Highway Safety Program Grants Rule *	<ul style="list-style-type: none"> State target establishment and reporting requirements. Highway safety plan content, reporting requirements, and approval. <p><small>* Interim Final Rule issued by NHTSA in January 2013.</small></p>
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Highway Conditions

Pavement and Bridge Performance Measure Rule	<ul style="list-style-type: none"> Propose and define pavement and bridge condition measures, along with minimum condition standards, target establishment, progress assessment and reporting requirements.
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Asset Management Plan Rule	<ul style="list-style-type: none"> Contents and development process for asset management plan. Minimum standards for pavement and bridge management systems.
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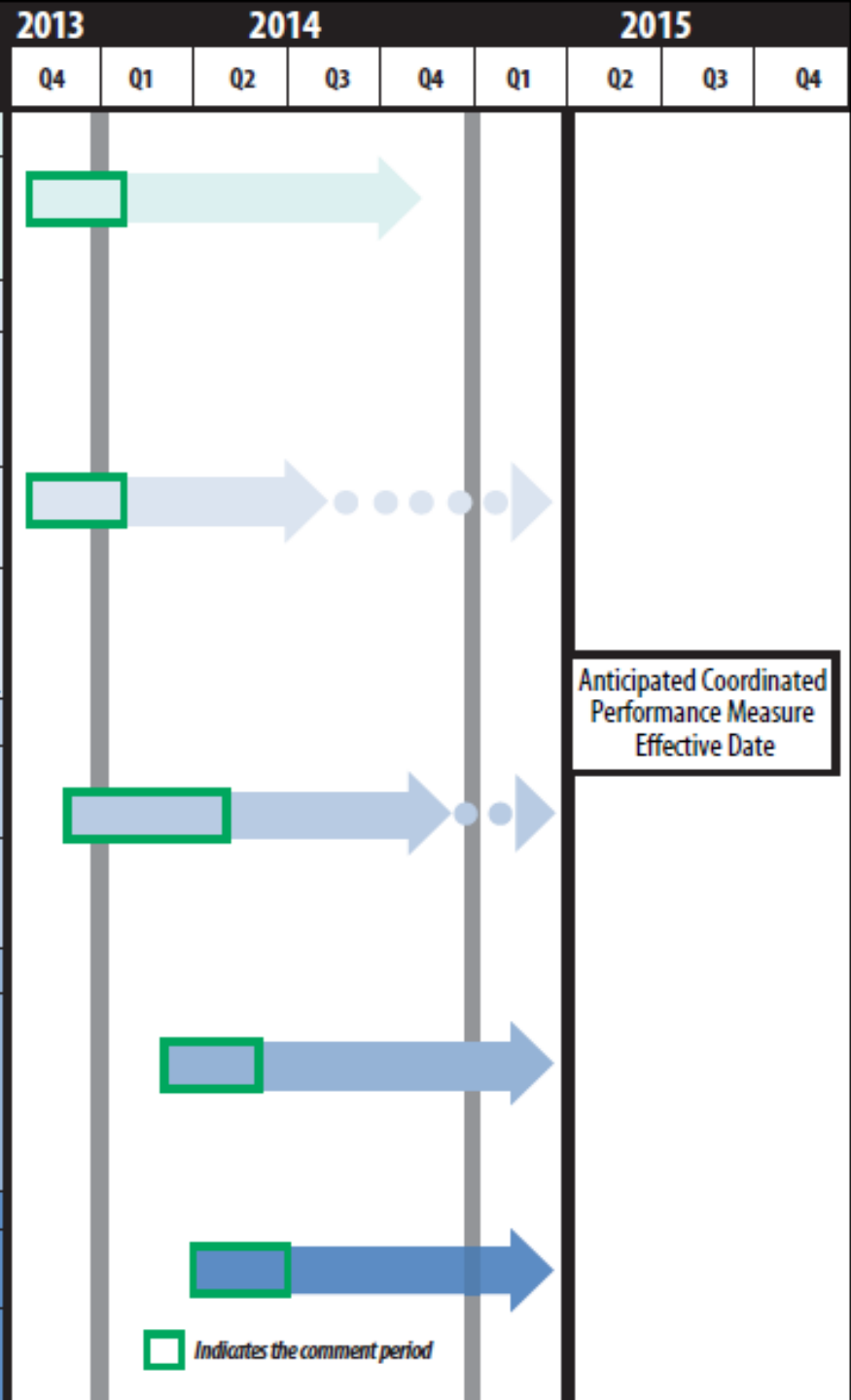
Congestion/System Performance

System Performance Measure Rule	<ul style="list-style-type: none"> Define performance of the interstate system, non-interstate national highway system, and freight movement on the interstate system. Finalize interpretation of scope of CMAQ performance requirements, including congestion and on-road mobile source emissions. Summarize MAP-21 highway performance measure rules.
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Transit Performance

Transit State of Good Repair Rule	<ul style="list-style-type: none"> Define state of good repair and establish measures. Transit asset management plan content, target establishment and reporting requirements.
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Transit Safety Plan Rule	<ul style="list-style-type: none"> Define transit safety standards. Transit safety plan content and reporting requirements.
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What did AASHTO Ask For?

AASHTO	MAP-21
Strengthen recognition that the federal-aid highway program is a federally assisted, state-administered program	YES
Maintain existing balance of authority	YES
Continue broad flexibility in planning procedures	YES
Avoid new administrative burdens	YES
Incorporate performance-based planning and programming aspects	YES
Maintain separation between planning requirements and discretionary grant programs	YES
Streamline fiscal constraint	NO

Planning

- Give State DOTs time to implement planning policies
- Avoid imposing new administrative burdens
- Maintain existing balance of authority
- Ensure minimum conditions do not force worst-first
- Provide more flexibility to determine NHS routes
- State DOTs should be eligible to receive TAP funds
- Remove operations eligibility restriction from CMAQ
- Use a collaborative approach to data practices

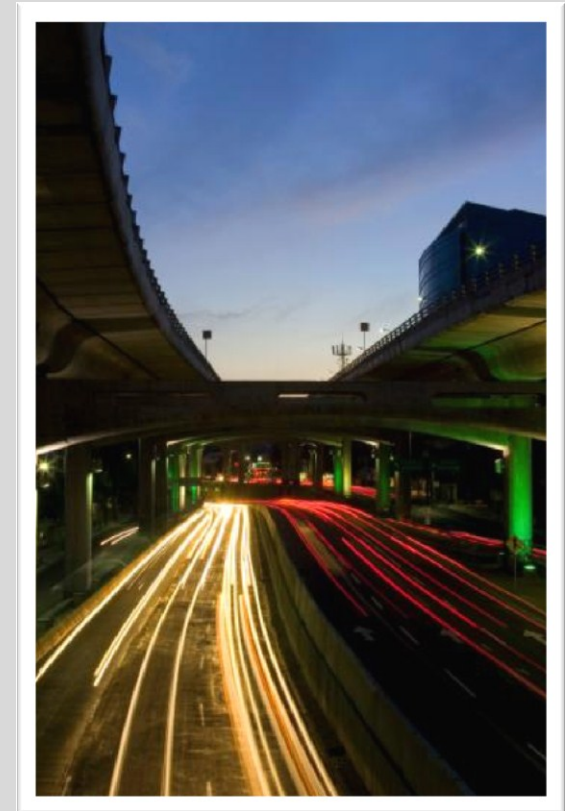
Performance Measures

- Give State DOTs time to implement performance management policies
- Resolution
 - Do not link performance measures to apportionment
 - Do not establish any additional national-level measures

SHRP2

Implementing SHRP2 Solutions

- Moving Forward
- Collaboration of AASHTO, FHWA, and SHRP2/TRB staff
- Over 65+ high-priority products introduced over the next several years
- Users run the gamut of the transportation industry
- Selected products integrated into current transportation practices



Capacity Focus Area Objective

- Congressional charge:
 - Develop tools for systematically integrating environmental, economic, and community requirements into the analysis, planning, and design of new highway capacity projects.
- Focus on a collaborative approach:
 - Leads to better projects delivered faster



Focus Area Products

- Two products are being implemented now:
 - Implementing Ecological (C06)
 - Expedited Planning and Environmental Review (C19)
- One product slated for next round of implementation funding (2014)
 - Freight Demand Modeling and Data Improvement Strategic Plan (C20)
- Remaining products will be considered for future implementation funding

Capacity Product Highlights: TCAPP

The screenshot displays the TCAPP website with a green header and a dark navigation bar. The main content area is divided into two columns. The left column contains text sections: 'What is TCAPP?' with a descriptive paragraph, 'How do I get started?' with a paragraph and a link to the 'Decision Guide', and a partially visible 'LONG RANGE TRANSPORTATION PLANNING' section with steps LRP-1 through LRP-6. The right column features a video player titled 'TCAPP Introductory Video' with a play button, and a section titled 'How does TCAPP work in the real world?' with a video thumbnail. The website includes a search bar, a print/contact/about/glossary link, and a navigation menu with items like Home, Decision Guide, Assessment, User Portals, Applications, and Library.

Capacity Product Highlights: T-PICS



My Project Tools

You enter data characteristics of your own project. On the View Results Screen you can see the likely ranges of economic impacts from your project, and estimates of project cost and traffic volume. You will have the opportunity to adjust cost and traffic estimates, and to adjust complementary regional economic development factors to properly reflect your region. In turn, these adjustments will drive changes in expected economic impacts of your project.

[View Results](#)

Project Type: Bypass Limited Access Road Beltway Interchange Widening
 Bridges Access Road Connector

Region: New England/Mid-Atlantic Southwest Southeast International
 Rocky Mountain/Far West Great Lakes/Plains

Urban/Class Level: Rural Mixed Metro

Economic Distress: Distressed Only Non Distressed Only

Length of your Project: Miles

Capacity Product Highlights: Freight Strategic Plan

- Recommends establishing a Global Freight Research Consortium:
 - Peer-based consortium would enable, fund, and promote research and enhanced analytical approaches
 - Includes public organizations—national and international—together with private organizations
- Global Freight Research Consortium focus areas:
 - Define issues ripe for research innovation
 - Provide recognition and incentives to spur breakthroughs
 - Conduct regular innovation forums
 - Promote technology transfer from other disciplines
 - Promote an international focus
 - Recognize the application of completed research

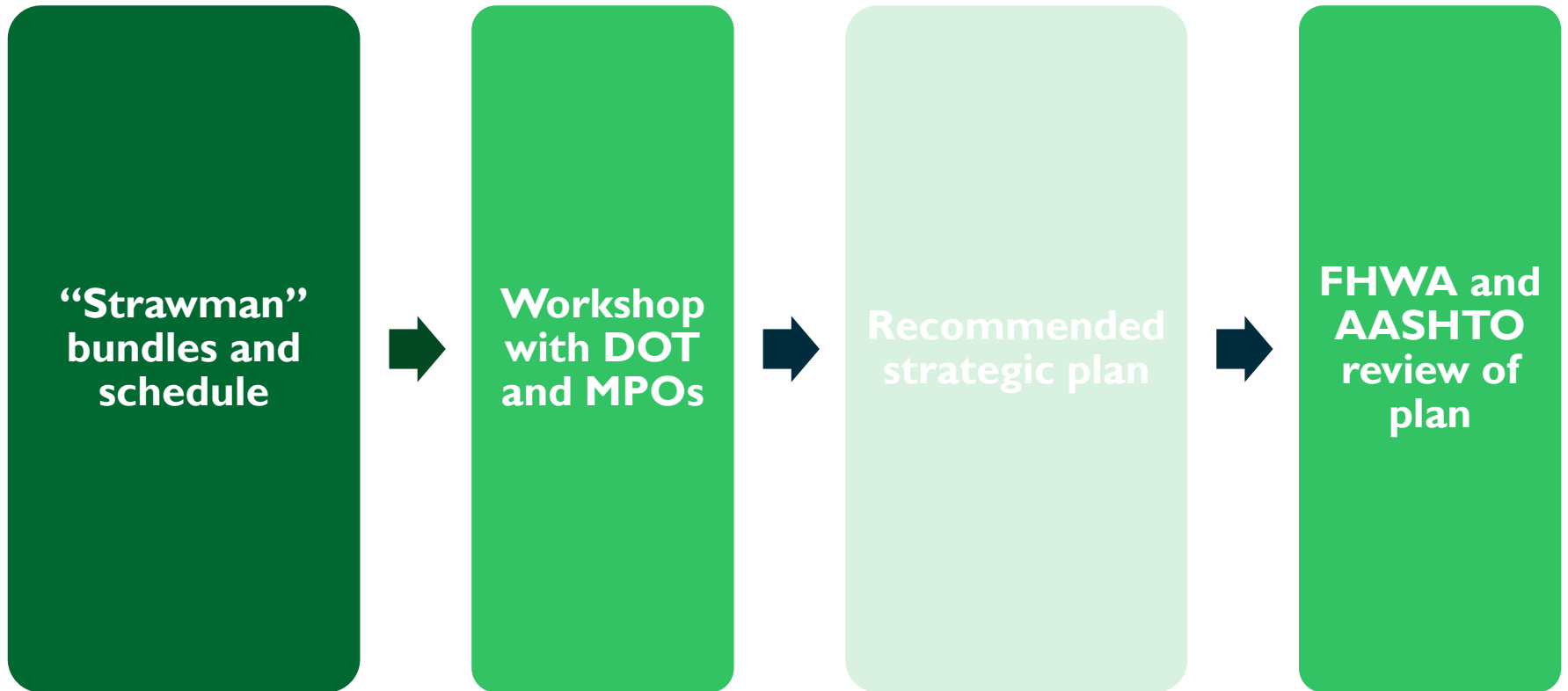
Prioritizing States' Needs

- AASHTO's role is focused on identifying which products meet the states' practical needs
- We are relying on members and committees to define how implementation can be successful

Why a Strategic Plan?

- Group similar projects and plan for implementation together
 - Make better use of implementation planning workshop participants' time
 - Identify linkages for the implementation process to use resources efficiently
- Create consistency across capacity focus area
 - Implementation goals that can be applied to each product

Strategic Plan Process



Process Bundle

Performance Measures for Highway Capacity Decision Making (C02)	\$1.00	<ul style="list-style-type: none"> • Resource for selecting performance measures • Includes 17 performance factors organized around five broad topics
Transportation Visioning in Communities (T-VIZ) (C08)	\$1.00	<ul style="list-style-type: none"> • Guide and website with approaches to developing a shared vision
Freight Planning Guide (C15) Funding Year: 2014	\$1.60	<ul style="list-style-type: none"> • Blueprint for effectively considering freight in planning and decision making • Provides a decision making framework to effectively integrate market-driven freight considerations into planning
Incorporating Greenhouse Gas Emissions into the Collaborative Decision-Making Process (C09)	\$0.05	<ul style="list-style-type: none"> • Guide to how greenhouse gas (GHG) emissions calculations can be incorporated into transportation planning and decision-making
The Effect of PPPs on Planning, Environmental Review and Collaborative Decision Making (C12)	\$0.05	<ul style="list-style-type: none"> • Documents a business process to help determine when and how to consider private sector participation in the project planning process

Analytical Tools Bundle

Integrated Advanced Travel Demand Model with Mode Choice Capacity and Finely-Grained Time-Sensitive Networks (C10A/B)	\$4 (includes funding for C46)	<ul style="list-style-type: none">Open source software that links travel behavior choices to better reflect real-world dynamics.
Improving Our Understanding of How Highway Congestion and Pricing Affect Travel Demand (C04)	\$0.05	<ul style="list-style-type: none">Mathematical descriptions of highway-user behavioral responses to congestion, travel-time reliability, and pricing
Understanding the Contribution of Operations, Technology, and Design to Meeting Highway Capacity Needs (C05)	\$0.05	<ul style="list-style-type: none">Guide that will allow agencies to use enhanced simulation models to test the effectiveness of operations strategies.
The Effect of Smart Growth on Daily Travel (SmartGAP) (C16)	\$0.05	<ul style="list-style-type: none">Provides planners with scenario forecasting tools to estimate smart growth's effects

Economic Impact Analysis Tools

Economic Impact Analysis Tools and Case Studies (T-PICS) (C03/C11)

\$1.50

- Sketch tool for more accurate estimates of the economic impacts of highway capacity projects

Freight Modeling

Freight Demand Modeling and Data Improvement Strategic Plan (C20)

\$3.20

- Strategic plan that provides organizational approach to identifying freight modeling and data priority needs
- Recommends the creation of the Global Freight Research Consortium

TCAPP

TCAPP: A Framework for Collaborative, Highway Capacity Decision Making (C01)

\$3.5
(includes
funding for
C22)

- Web resource to support collaborative decision making
- Website will host other SHPR2 web tools

Include embedded products, particularly C09 (GHGs) and C12 (P3s).

Recommendation: 5 IPWs

FFY:	2014				2015			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Process		IPW	Draft Implementation Plan and Scope		Implementation Activities			
Analytical Tools		IPW	Draft Implementation Plan and Scope		Implementation Activities			
Economic Analysis Tool		IPW	Draft Implementation Plan and Scope		Implementation Activities			
Freight Modeling	IPW	Draft Implementation Plan and Scope		Implementation Activities				
TCAPP				IPW	Draft Implementation Plan and Scope	Implementation Activities		

Questions