

# Operations Performance Measures and Management (OPMM) Program Road Map

**Publication No. FHWA-HOP-14-012**

**FINAL: May 1, 2014**



U.S. Department of Transportation  
**Federal Highway Administration**

(This side intentionally left blank)

# TABLE OF CONTENTS

OPMM PROGRAM GOALS..... 1

THE “PERFECT WORLD” OF MEASURING CONGESTION ..... 1

CONTENTS OF OPMM PROGRAM ROAD MAP PROJECT DESCRIPTIONS..... 2

COORDINATION ACROSS FHWA TEAMS, DIVISIONS AND OFFICES..... 3

OPMM PROJECT DESCRIPTIONS ..... 6

(This side intentionally left blank)

## **OPMM PROGRAM GOALS**

This report documents the FHWA Operations Performance Measures and Management (OPMM) Program Road Map covering the 5-year period from 2014 through 2018. The Program Road Map aligns with the following FHWA OPMM Program goals:

- Assist internal/external stakeholders with implementing MAP-21 measure requirements and the measurement of congestion/reliability, and
- Assist internal/external stakeholders with implementing performance management for operations.

The FHWA OPMM Program achieves the goals above by:

- Providing training, technical assistance and guidance where necessary,
- Undertaking or coordinating research where gaps exist and archiving results/links,
- Developing congestion/reliability performance measures in urban areas for external/internal reports,
- Coordinating all Office of Operations performance measures activities, and
- Providing outreach where necessary and providing sources of information on the subject matter.

The projects documented in the Program Road Map directly tie to these OPMM Program goals and activities.

## **THE “PERFECT WORLD” OF MEASURING CONGESTION**

In December 2013, a peer exchange workshop on the “Perfect World of Measuring Congestion” from an operations perspective was conducted to identify the “perfect world” of measuring congestion as well as possible projects and implementation efforts that could be taken in the next five years to help FHWA and the greater Operations community get there. The results of the workshop were used to assist in the development of this OPMM Road Map. Many of the projects in the OPMM Program Road Map were discussed at the December 2013 peer exchange.

To stimulate discussion at the workshop, four “white papers” on key performance monitoring and management topics were prepared. One of the papers was entitled “Framework for Gauging State-of-the-Practice in Performance Monitoring and Management.” The paper presents a framework (see Figure 1) to classify best practices in operations performance monitoring based on these characteristics:

- Performance measures (content and form),
- Performance management (agency culture),
- Data used,
- Transportation modes,
- Facility and trip coverage, and
- Traveler preferences and tradeoffs consideration.

The framework shown in Figure 1 illustrates four “ribbon categories” of bronze, silver, gold and platinum to illustrate maturity level for the given characteristics. The capability maturity model illustrated in Figure 1 was inspired by the capability maturity model applied to systems operations and management described in SHRP 2 Report L06 (Institutional Architectures to Improve System Systems Operations and Management) ([http://onlinepubs.trb.org/onlinepubs/shrp2/SHRP2\\_S2-L06-RR-1.pdf](http://onlinepubs.trb.org/onlinepubs/shrp2/SHRP2_S2-L06-RR-1.pdf)).

Observation of practices for operations performance monitoring and management provides evidence of a varying degree of the extent that performance data are used in decision-making for transportation projects and programs. The platinum level shown in Figure 1 was used in the workshop to provide a visual illustration to attendees of what the “perfect world” might look like. This framework illustration of the “perfect world” guided the workshop and inspired many of the project activities included in this Road Map.

## **CONTENTS OF OPMM PROGRAM ROAD MAP PROJECT DESCRIPTIONS**

The Road Map includes 18 projects. The projects are grouped around four subject areas that are critical to OPMM Program goals:

- MAP-21 Implementation (6 projects),
- Performance Measures (Congestion, Reliability) (6 projects),
- Performance Management (5 projects), and
- Operations Performance Measures Coordination (1 project).

The projects are sub-categorized by three project types:

- Technical Assistance (Guidance/Training),
- Outreach/Coordination, and
- Research/Implementation.

Figure 2 shows the OPMM Program Road Map, including the 18 projects grouped by the four subject areas above and referenced to the above sub-category project types. The year/quarters when each project is anticipated to take place is also included in the Figure.

The project descriptions that follow include:

- Project number/title,
- Subject area,
- Project type(s),
- Time period,
- Project objective,
- Deliverable,
- Project lead,
- Project description,

- Possible coordination opportunities (if applicable – other FHWA Offices, other agencies, etc.), and
- OPMM Road Map coordination (if applicable – an indication of other OPMM Road MAP projects that should be coordinated with the subject project); these project linkages are also shown by connecting lines between projects in Figure 2.

In the project descriptions, the project leads are identified with the following acronyms:

HOP = Office of Operations;

HEP = Office of Planning, Environment and Realty;

HPL = Office of Policy;

TPM = Office of Transportation Performance Management;

RDT = Office of Research, Development & Technology;

SSOM = AASHTO Subcommittee on Systems Operation and Management;

SCOPM = AASHTO Standing Committee on Performance Management; and

MMUT = Mobility Measures in Urban Transportation, an existing pooled fund study.

## **COORDINATION ACROSS FHWA TEAMS, DIVISIONS AND OFFICES**

Although it may be a specialized topic area, the inputs to and outcomes from operations performance measurement and management are interwoven through several FHWA Offices and Teams. It will be critically important to coordinate and communicate with these other Offices and Teams as the Road Map activities are initiated and as they proceed. Within each project, a tentative Project Lead is indicated, as well as others with whom to coordinate. This listing will be considered as a minimum required and, when in doubt, coordination and communication will extend beyond the minimum required stakeholders. Plus, outreach for guidance and technical assistance efforts will be coordinated with FHWA's Resource Center Operations Team.

**Figure 1. Illustration of Operations Performance Management Capability Maturity Model for Gauging Current Practice**

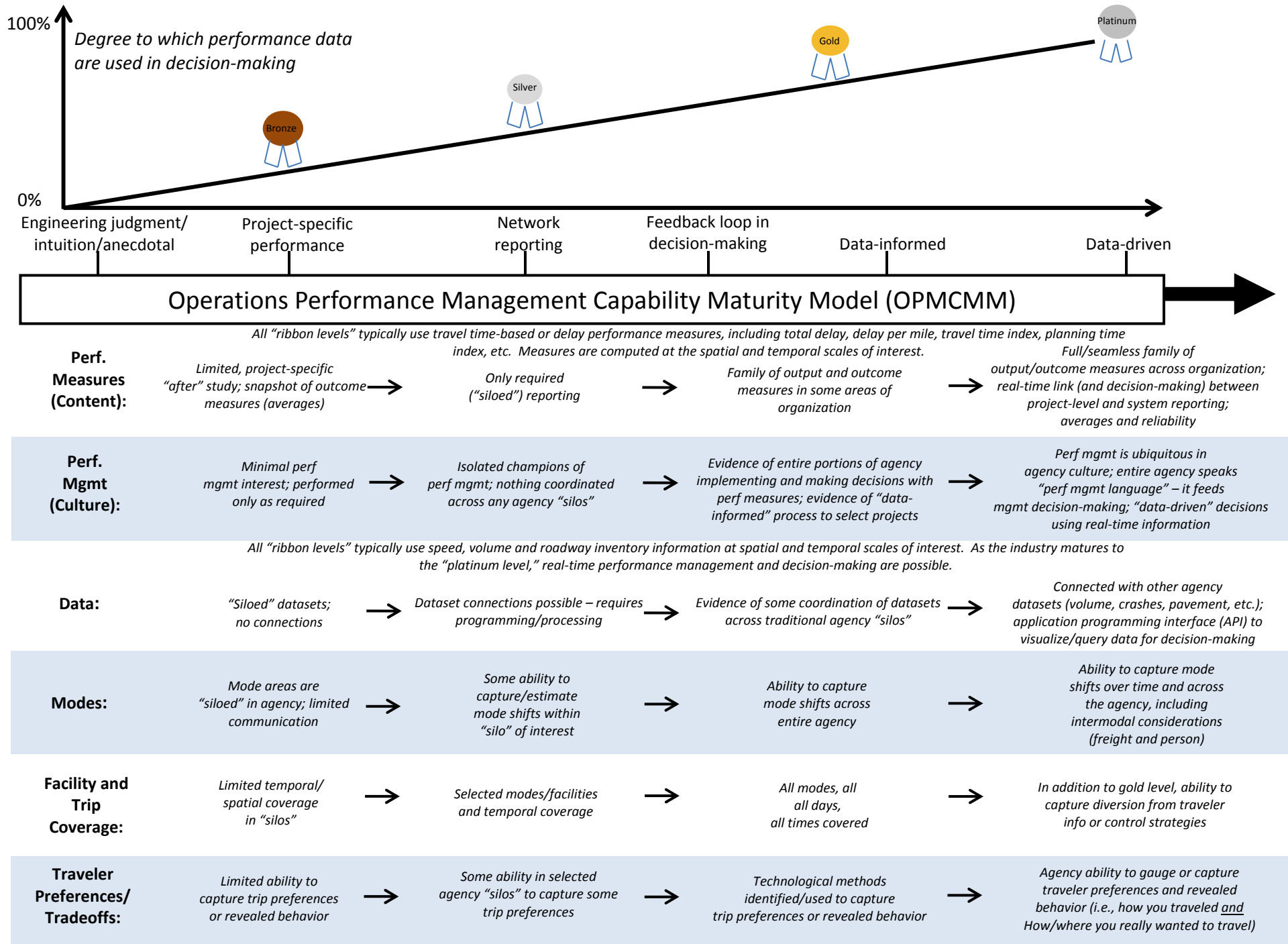
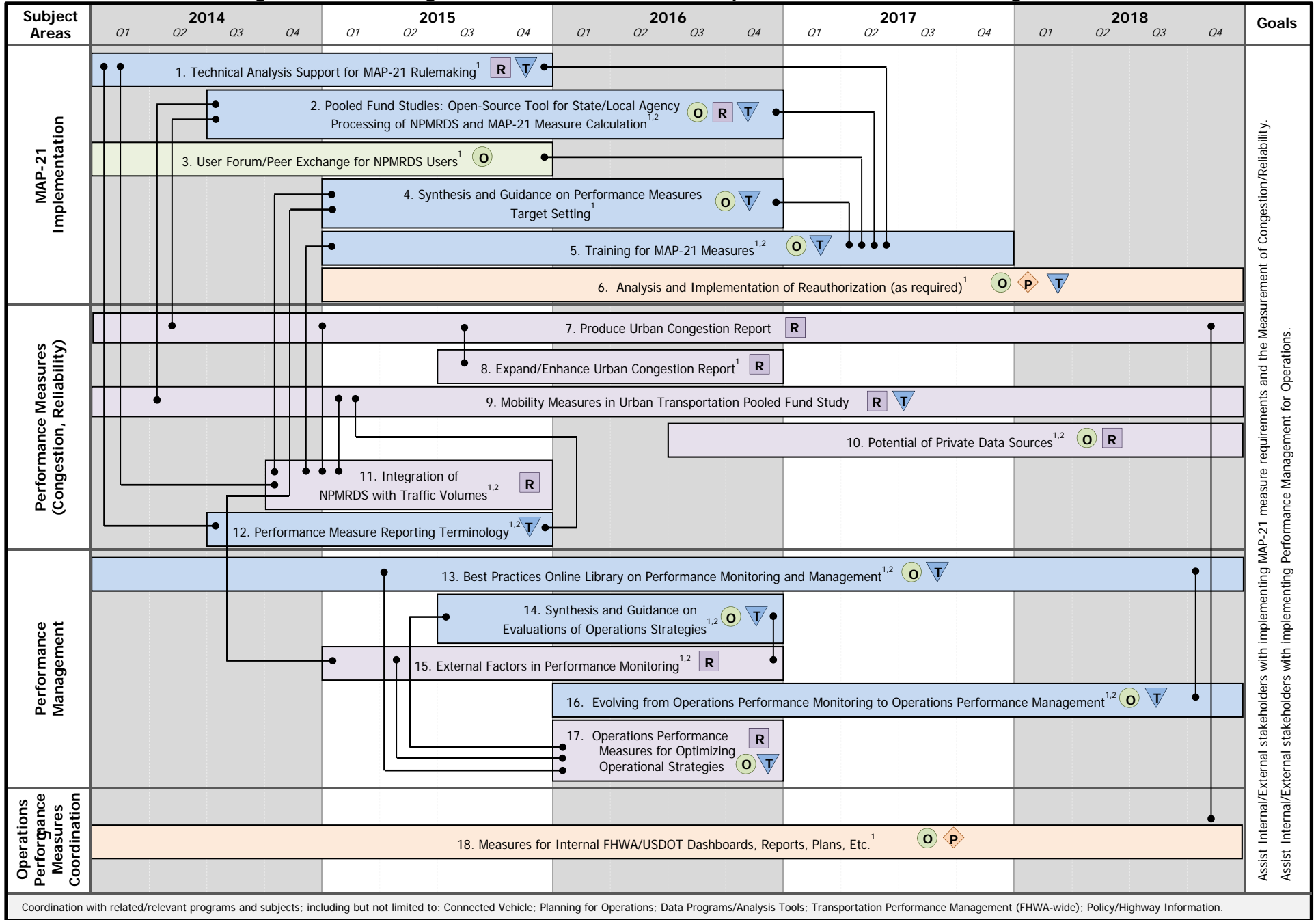




Figure 2. OPMM Program Research Plan and Road Map – Calendar Years 2014 through 2018



Coordination with related/relevant programs and subjects; including but not limited to: Connected Vehicle; Planning for Operations; Data Programs/Analysis Tools; Transportation Performance Management (FHWA-wide); Policy/Highway Information.

[O] Outreach/Coordination [P] Policy/Internal [R] Research/Implementation [T] Technical Assistance (guidance/training) ● Coordinated Activities

<sup>1</sup> Coordinated with offices/agencies beyond FHWA Office of Operations

<sup>2</sup> FHWA OPMM may not be the lead

## OPMM PROJECT DESCRIPTIONS

<b>Project No./Title</b>	<b>#1: Technical Analysis Support for MAP-21 Rulemaking</b>
<b>Subject Area</b>	MAP-21 Implementation
<b>Project Type(s)</b>	Research/Implementation, Technical Assistance
<b>Time Period</b>	2014 to 2015

**Project Objective:** Perform technical analysis in support of MAP-21 rulemaking process.

**Deliverable:** Technical memorandum.

**Project Lead:** HOP, coordinate with TPM.

**Project Description:** MAP-21 calls for the establishment of performance measures and targets in several program areas. FHWA Office of Operations is responsible for the development of the performance measure requirements and calculation procedures for the mobility/reliability-related performance measure requirements in MAP-21. Therefore, FHWA Office of Operations is developing the Notice of Proposed Rulemaking (NPRM) related to these measures.

As a part of the rulemaking process, a need for technical analyses is expected. The technical analyses may include testing/developing different performance measures calculation procedures for the mandated measures using available datasets with the goal of identifying technically sound, and meaningful methods for inclusion in the eventual NPRM. Another area of technical analyses need is arterial performance measure calculations and reporting on the National Highway System (NHS).

OPMM Road Map Project Coordination: Project #5 (Training for MAP-21 Measures); Project #11 (Integration of NPMRDS with Traffic Volumes); Project #12 (Performance Measure Reporting Terminology).

<b>Project No./Title</b>	<b>#2: Pooled Fund Studies: Open-Source Tool for State/Local Agency Processing of NPMRDS and MAP-21 Measure Calculation</b>
<b>Subject Area</b>	MAP-21 Implementation
<b>Project Type(s)</b>	Outreach/Coordination, Research/Implementation, Technical Assistance
<b>Time Period</b>	2015 to 2016

**Project Objective:** Develop an NPMRDS data processing tool for transportation applications; develop a MAP-21 performance measure calculation tool.

**Deliverable:** Processing tools, user's guide; sample MAP-21 measure calculations.

**Project Lead:** HOP or AASHTO SSOM/SCOPM, coordinate with MMUT.

**Project Description:** This project will develop an open-source processing tool using the NPMRDS as input. It is envisioned that FHWA would lead this pooled fund study and participants would likely include (though not be exclusive to) state DOTs/MPOs that do not have sophisticated tools and processing methods in place for performance measure calculation. The processing tool may provide quality control and quality assurance procedures to "clean up" NPMRDS for missing values. The project will include the development of a user's guide for the processing tool.

The second part of this project is sample calculations of MAP-21 measure calculations using the processing tool that results from this study. This results in the MAP-21 performance measures being calculated by FHWA and/or the contractor to ensure consistency and enable state DOTs/MPOs to focus on the measure results rather than the nuances of the measure calculations.

The measure calculations and reporting on the National Highway System (NHS) for MAP-21 includes freeways and arterials. There is particular industry interest in the tool for arterial performance measures calculations and reporting.

Possible Coordination Opportunity: AASHTO SCOPM project #7 (Determining How to Use the NPMRDS to Address National Measures); AASHTO SCOPM project #12 (Understanding and Improving National Benchmarking).

OPMM Road Map Project Coordination: Project #5 (Training for MAP-21 Measures); Project #7 (Produce Urban Congestion Report); Project #9 (Mobility Measures in Urban Transportation Pooled Fund Study).

<b>Project No./Title</b>	<b>#3: User Forum and Peer Exchange for NPMRDS Users</b>
<b>Subject Area</b>	MAP-21 Implementation
<b>Project Type(s)</b>	Outreach/Coordination
<b>Time Period</b>	2014 to 2015

**Project Objective:** Establish and continue webinars and peer exchange among NPMRDS users.

**Deliverable:** Regularly-scheduled meetings/webinars; maintain on-line forum/community.

**Project Lead:** HOP, coordinate with SSOM and SCOPM.

**Project Description:** This project would establish a “forum” (on-line/virtual community) for asking questions, getting answers and sharing experiences related to the use of the NPMRDS dataset. In addition to the “always-open” on-line forum, regularly-scheduled (e.g., quarterly or semi-annual webinars and peer exchanges) will be hosted as part of this project.

Possible Coordination Opportunity: AASHTO SCOPM project #7 (Determining How to Use the NPMRDS to Address National Measures)

OPMM Road Map Project Coordination: Project #5 (Training for MAP-21 Measures).

<b>Project No./Title</b>	<b>#4: Synthesis and Guidance on Performance Measure Target Setting</b>
<b>Subject Area</b>	MAP-21 Implementation
<b>Project Type(s)</b>	Outreach/Coordination, Technical Assistance,
<b>Time Period</b>	2015 to 2016

**Project Objective:** Develop guidebook on performance measure target setting.

**Deliverable:** Guidebook.

**Project Lead:** HOP, coordinate with SCOPM (has already done work on target setting).

**Project Description:** MAP-21 calls for the establishment of targets by state DOTs/MPOs for selected performance measures as specified by FHWA. Because of this, many state DOTs and MPOs are seeking technical assistance and guidance about how to set targets on performance measures.

This project will perform a synthesis of practice as it relates to performance measure target setting. Based upon the lessons learned and experiences documented in the synthesis, this project will fund the development of a guidebook of recommended procedures for setting targets. It is envisioned that one aspect of setting the targets will be understanding and incorporating external factors that can affect performance monitoring; therefore, there is coordination required between this effort and OPMM Project #14.

Possible Coordination Opportunity: FHWA Office of Transportation Performance Management; SCOPM project #11 (Guidance on Target Collaboration and Target Setting Process).

OPMM Road Map Project Coordination: Project #5 (Training for MAP-21 Measures); Project #11 (Integration of NPMRDS with Traffic Volumes); OPMM Project #15 (External Factors in Performance Monitoring).

<b>Project No./Title</b>	<b>#5: Training for MAP-21 Measures</b>
<b>Subject Area</b>	MAP-21 Implementation
<b>Project Type(s)</b>	Outreach/Coordination, Technical Assistance
<b>Time Period</b>	2015 to 2017

**Project Objective:** Deliver training on guidance/procedures developed in previous projects.

**Deliverable:** Instructor and participant training course materials.

**Project Lead:** TPM and HOP

**Project Description:** Several projects in the OPMM Road Map will result in findings, case studies and collective experiences of value to FHWA partnering agencies. This project will assemble and develop this material into a training course with a focus on MAP-21 performance measures for state DOTs, MPOs and other interested stakeholders.

The following projects in the OPMM Road Map will likely provide content for this training course:

- Technical Analysis Support for MAP-21 Rulemaking (Project #1),
- Pooled Fund Studies: Open-Source Tool for State/Local Agency Processing of NPMRDS and MAP-21 Measure Calculation (Project #2),
- User Forum/Peer Exchange for NPMRDS Users (Project #3),
- Synthesis and Guidance on Performance Measures Target Setting (Project #4), and
- Integration of NPMRDS with Traffic Volumes (Project #6).

Possible Coordination Opportunity: FHWA Office of Transportation Performance Management.

OPMM Road MAP Project Coordination: Project #1 (Technical Analysis Support for MAP-21 Rulemaking); Project #2 (Pooled Fund Studies: Open-Source Tool for State/Local Agency Processing of NPMRDS and MAP-21 Measure Calculation); Project #3 (User Forum/Peer Exchange for NPMRDS Users); Project #4 (Synthesis and Guidance on Performance Measures Target Setting); Project #11 (Integration of NPMRDS with Traffic Volumes).

<b>Project No./Title</b>	<b>#6: Analysis and Implementation of Reauthorization (as required)</b>
<b>Subject Area</b>	MAP-21 Implementation
<b>Project Type(s)</b>	Outreach/Coordination, Policy/Internal, Technical Assistance
<b>Time Period</b>	2015 to 2018

**Project Objective:** Perform analysis and implementation activities as needed for transportation bill reauthorization.

**Deliverable:** Materials developed as required for reauthorization.

**Project Lead:** HOP, coordinate with others as required.

**Project Description:** This project is a placeholder for HOP activities needed to inform transportation bill reauthorization following MAP-21. This is an activity internal to HOP as required.

<b>Project No./Title</b>	<b>#7: Produce Urban Congestion Report</b>
<b>Subject Area</b>	Performance Measures
<b>Project Type(s)</b>	Research/Implementation
<b>Time Period</b>	2014 to 2018

**Project Objective:** Produce a national Urban Congestion Report every quarter that includes all U.S. cities with greater than 1 million population, and produce annual Urban Congestion Trends Report.

**Deliverable:** Quarterly Urban Congestion Report document, annual Urban Congestion Trends Report.

**Project Lead:** HOP.

**Project Description:** The Urban Congestion Report (UCR) has been produced on a quarterly basis and characterizes emerging traffic congestion and reliability trends at the national and city level. Since 2008, it has been produced using fixed-point sensor data from 19 urban areas. The possibilities to expand sensor coverage have been limited, due to state DOT deployments and poor data accessibility. In 2013, FHWA licensed a private sector travel time dataset (NPMRDS) that provides national coverage and can readily be used to produce congestion and reliability performance measures in urban areas. This project will transition the existing UCR data process (using fixed-point sensors) to one using this NPMRDS dataset. Once the transition to a better data source has been completed, the reporting process will be automated as much as possible to produce cost-effective quarterly reporting.

This project also includes the production of the annual Urban Congestion Trends Report summarizing annual mobility and reliability statistics along with case studies of successful operational projects or programs.

OPMM Road Map Coordination: Project #2 (Pooled Fund Studies: Open-Source Tool for State/Local Agency Processing of NPMRDS and MAP-21 Measure Calculation); Project #8 (Expand/Enhance Urban Congestion Report); Project #11 (Integration of NPMRDS with Traffic Volumes); Project #18 (Measures for Internal FHWA/USDOT Dashboards, Reports, Plans, Etc.).



<b>Project No./Title</b>	<b>#8: Expand/Enhance Urban Congestion Report</b>
<b>Subject Area</b>	Performance Measures
<b>Project Type(s)</b>	Research/Implementation
<b>Time Period</b>	2015 to 2016

**Project Objective:** Enhance/expand the Urban Congestion Report (UCR) to demonstrate current best practices (e.g., measures, visuals, etc.) in performance monitoring.

**Deliverable:** Final technical report that describes enhancements and supporting algorithms and/or graphical elements.

**Project Lead:** HOP, coordinate with TPM.

**Project Description:** The basic structure and measures reporting in the UCR has been unchanged since 2008. Therefore, there is a need to enhance or possibly expand the UCR to demonstrate current best practices in performance monitoring. Examples of possible enhancements include more/different performance measures, more/different visuals and graphics (such as infographics), more interactivity (permitting drilldown reporting on specific roads), etc. These enhancements to UCR can then be used as an ongoing illustration of best practices to state DOTs and MPOs.

OPMM Road Map Project Coordination: Project #7 (Produce Urban Congestion Report).

<b>Project No./Title</b>	<b>#9: Mobility Measures in Urban Transportation Pooled Fund Study</b>
<b>Subject Area</b>	Performance Measures
<b>Project Type(s)</b>	Research/Implementation, Technical Assistance
<b>Time Period</b>	2014 to 2018

**Project Objective:** Pooled fund study of FHWA and 13 state DOTs targeting timely and pressing urban mobility and performance measurement issues scoped by the sponsors every year.

**Deliverable:** Various technical memorandums and spreadsheets (as applicable) by task.

**Project Lead:** HOP.

**Project Description:** This study focuses on mobility and reliability performance measures, data and issues. Emphasis areas in recent years include emerging data sources, freight movement, arterial street mobility issues, reliability performance measures and preparing agencies for MAP-21 performance management requirements.

The products of the pooled fund study are centered on urban mobility issues. Products from the study meet a range of needs and include a variety of printed and electronically accessible reports, data and information pages, applications, and a generally-accessible Internet website. The analysis procedures and resulting performance measures have been used in multimodal performance measurement efforts by numerous state DOTs and MPOs.

OPMM Road Map Coordination: Project #2 (Pooled Fund Studies: Open-Source Tool for State/Local Agency Processing of NPMRDS and MAP-21 Measure Calculation); Project #11 (Integration of NPMRDS with Traffic Volumes); Project #12 (Performance Measure Reporting Terminology).

<b>Project No./Title</b>	<b>#10: Potential of Private Data Sources</b>
<b>Subject Area</b>	Performance Measures
<b>Project Type(s)</b>	Outreach/Coordination, Research/Implementation
<b>Time Period</b>	2016 to 2018

**Project Objective:** Identify and document if there is more than just travel time and origin-destination data available from private-company data providers.

**Deliverable:** Report.

**Project Lead:** RDT or HOP.

**Project Description:** Several private-sector data providers make speed (travel time) or origin-destination available for a number of public-sector performance monitoring applications. These data sources have been a “game-changer” for transportation analyses due to their relatively low cost and ubiquitous coverage. Likewise, social media and other crowd-sourced data sources data might inform performance monitoring.

There may be other areas where private-company or social media data can provide other data useful to performance monitoring. For example, another frontier where private-company data may facilitate transportation analyses is individual, yet anonymized traveler choices. These disaggregate data on traveler choices could further be coordinated with traveler information or operational controls to identify the impacts of operational projects or programs.

This project will include engaging private companies and discussing data availability to meet additional needs beyond traditional speed or origin-destination data.

Possible Coordination Opportunity: FHWA Connected Vehicle Program.

<b>Project No./Title</b>	<b>#11: Integration of NPMRDS with Traffic Volumes</b>
<b>Subject Area</b>	Performance Measures
<b>Project Type(s)</b>	Research/Implementation
<b>Time Period</b>	2014 to 2015

**Project Objective:** Document a process to produce 5-minute volume estimates from daily volumes to match with the 5-minute travel time information in NPMRDS.

**Deliverable:** Technical memorandum.

**Project Lead:** SCOPM, MMUT, or HOP; coordinate with HPL (provides HPMS volumes).

**Project Description:** The calculation of delay is a common performance measure for operations performance measures. Estimating delay requires an estimate of volume in addition to an estimate of speed (or travel time). This project will combine volumes to the NPMRDS speed data set – a process typically called “conflation.” Traffic volumes (passenger cars and trucks) would be placed on the NPMRDS speed Traffic Message Channel (TMC) network. TMC is the spatial segment definition used by the private-sector for traveler information reporting.

Roadway volume data typically are in the form of average daily traffic (ADT), while the NPMRDS speed data are in 5-minute travel time bins. This project will document the process by which 5-minute volume estimates are derived from daily traffic volumes for passenger cars and trucks.

Project budget levels can vary widely due to the miles of system conflated and the “grade” of conflation performed (i.e., the extent of quality control), which is a function of the application/use for the conflated data. It is also possible that existing conflated data could be licensed.

OPMM Road Map Project Coordination: Project #1 (Technical Analysis Support for MAP-21 Rulemaking); Project #4 (Synthesis and Guidance on Performance Measures Target Setting); Project #5 (Training for MAP-21 Measures); Project #7 (Produce Urban Congestion Report); Project #9 (Mobility Measures in Urban Transportation Pooled Fund Study).

<b>Project No./Title</b>	<b>#12: Performance Measure Reporting Terminology Guidance</b>
<b>Subject Area</b>	Performance Measures
<b>Project Type(s)</b>	Technical Assistance
<b>Time Period</b>	2014 to 2015

**Project Objective:** Develop guidebook of consensus on performance measure terminology and calculation procedure terminology to provide consistency for performance measure reporting.

**Deliverable:** Guidebook.

**Project Lead:** MMUT or HOP, coordinate with TPM.

**Project Description:** There is a broad range of performance measures used across transportation agencies for transportation system monitoring and decision-making. Often there is not a consistent language when terms such as “delay” or “travel time reliability” are used. The lack of terminology consistency means that communicating “delay” or “travel time reliability” in one state department of transportation (DOT) or metropolitan planning organization (MPO) could have a much different meaning in another state DOT or MPO. There is a need for consensus on common transportation performance measure terminology so all agencies are speaking a common language when reporting performance measures.

Some of the inconsistency in reported performance measures relates to how the measures are computed. For example, an annual planning time index (a travel time reliability measure) for a section of road can have a very different value depending upon the granularity of the data source and how those data are temporally/spatially aggregated and weighted to estimate the annual value. This project will also identify consistent terminology for calculation procedures for the measures so there is a consistent terminology of describing the reported measures.

The result of this work will be consistent ways of describing the measures on which agencies report.

OPMM Road Map Project Coordination: Project #1 (Technical Analysis Support for MAP-21 Rulemaking); Project #9 (Mobility Measures in Urban Transportation Pooled Fund Study).

<b>Project No./Title</b>	<b>#13: Best Practices Online Library on Performance Monitoring and Management</b>
<b>Subject Area</b>	Performance Management
<b>Project Type(s)</b>	Outreach/Coordination, Technical Assistance
<b>Time Period</b>	2014 to 2018

**Project Objective:** Develop and support annual maintenance of online library of performance monitoring and management best practices.

**Deliverable:** Online library of resources.

**Project Lead:** TPM, coordinate with HOP.

**Project Description:** Many state departments of transportation (DOTs) and metropolitan planning organizations (MPOs) are seeking information about best practices related to performance monitoring and management. While some of this information is readily available in traditional publications and sources, many best practices are not readily available, adequately documented, or published. There is a need for a “one-stop-shop” of current best practices and lessons learned.

An example of the final “look and operation” of this online library is the current Intelligent Transportation Systems (ITS) Joint Program Office (JPO) knowledge resources database (<http://www.itslessons.its.dot.gov/>). What makes this resource particularly user-friendly is that users can search for information about ITS in a variety of ways – text searches, keyword searches, browsing lists, by application, goals or even geography. It is envisioned that a similar format could be adopted for the performance monitoring and management online library to highlight lessons learned and best practices.

Possible Coordination Opportunities: AASHTO SCOPM project #14 (Performance Management Clearinghouse of Knowledge Portal); TRB Visualization Committee problem statement “Best Practices in Performance Measure Dashboard Design.”

OPMM Road Map Project Coordination: Project #16 (Evolving from Operations Performance Monitoring to Operations Performance Management); Project #17 (Operations Performance Measures for Optimizing Operational Strategies).

<b>Project No./Title</b>	<b>#14: Synthesis and Guidance on Evaluations of Operations Strategies</b>
<b>Subject Area</b>	Performance Management
<b>Project Type(s)</b>	Outreach/Coordination, Technical Assistance
<b>Time Period</b>	2015 to 2016

**Project Objective:** Develop guidebook of best practices and recommended before-after study procedures for evaluating operations strategies.

**Deliverable:** Guidebook.

**Project Lead:** RDT or HOP.

**Project Description:** Understanding the effectiveness of operational improvements is critical for effective decision-making and efficient allocation of limited resources. A study of the transportation system before and after the introduction of an operational strategy or program (i.e., “before-after study”) is a common method for evaluating the effectiveness of operational strategies. Transportation agencies commonly perform these studies and in this age of rapidly-improving/changing data, there is a need for guidance to effectively perform these studies. Typical before-after evaluation questions (among others) for inclusion in the Guidebook include:

- Ensuring the integrity of the data sources in the before-after time period analyzed;
- Incorporating the link between benefit-cost analysis (data and methods) to operations strategies (and to performance management as a whole);
- Establishing a proper evaluation baseline; and
- Ensuring observed changes in performance measures are due to the operational strategy itself and no other external factors.

This project will synthesize best practices for before-after studies and put forth recommended procedures for evaluating operations strategies.

Possible Coordination Opportunity: Other FHWA Offices – there may be some existing guidance.

OPMM Road Map Project Coordination: Project #15 (External Factors in Performance Monitoring); Project #17 (Operations Performance Measures for Optimizing Operational Strategies).

<b>Project No./Title</b>	<b>#15: External Factors in Performance Monitoring</b>
<b>Subject Area</b>	Performance Management
<b>Project Type(s)</b>	Research/Implementation
<b>Time Period</b>	2015 to 2016

**Project Objective:** Identify key external factors that can impact performance monitoring and provide guidance on the process for tracking external factors.

**Deliverable:** Guidebook.

**Project Lead:** HOP or RDT.

**Project Description:** There are many independent variables (or external factors) for which state DOTs, MPOs, and USDOT have little control over. These variables may affect performance measures and trends. Therefore, when using performance measures for reporting and/or decision-making, these variables must either be incorporated or their impact recognized in the performance of the transportation system and in the results of project evaluations.

This project will identify key attributes that should be tracked and reported and provide guidance on the process. A background paper entitled “Operations Performance Management: How Should External Events and Trends be Considered” was prepared for the December 2013 peer exchange on the “Perfect World of Measuring Congestion.” The paper identifies some possible examples of these external factors (variables), including the economy, societal factors (development patterns, housing costs, school quality, generational differences in travel), changes in travel demand, person-volume changes, weather, incidents, road work, connected or autonomous vehicles, and modal accessibility.

This project will include example calculations demonstrating the impact on measures/decisions of sample external factors (or ignoring them). The results will be documented in a guidebook for practitioners.

OPMM Road Map Project Coordination: Project #4 (Synthesis and Guidance on Performance Measures Target Setting); Project #14 (Synthesis and Guidance on Evaluations of Operations Strategies); Project #17 (Operations Performance Measures for Optimizing Operational Strategies).



<b>Project No./Title</b>	<b>#16: Evolving from Operations Performance Monitoring to Operations Performance Management</b>
<b>Subject Area</b>	Performance Management
<b>Project Type(s)</b>	Outreach/Coordination; Technical Assistance
<b>Time Period</b>	2016 to 2017

**Project Objective:** Develop guidebook to assist FHWA partnering agencies in evolving from performance monitoring activities to performance management.

**Deliverable:** Guidebook

**Project Lead:** HOP or RDT.

**Project Description:** As described in the Operations Performance Management Capability Maturity Model (OPMCMM) at the beginning of this Research Road Map, a critical element of the success of an agency in performance management activities is the extent to which that agency has embraced a culture of performance management. The “platinum level” of the OPMCMM for this characteristic is that performance management is ubiquitous in the agency culture, and the entire agency speaks the “performance management language,” and this feeds management decision-making.

This project will document success stories and lessons learned from selected agencies to encourage and make the case to agencies to transition from simple performance monitoring to performance management and performance-based decision-making. A key element of making this case for inclusion in the guidebook is understanding and quantifying the “return on investment” for better data to improve decision-making.

Another key element of this project is demonstrating the link of performance management to the planning process, regional data architecture and necessary coordination/collaboration efforts in the guidebook.

Possible Coordination Opportunity: FHWA Office of Transportation Performance Management; AASHTO SCOPM project #3 (Linking Investments to Performance Outcomes); AASHTO SCOPM #4 (Data Quality and Data Integration); SCOPM project #12 (Understanding and Improving National Benchmarking).

OPMM Road Map Program Coordination: Project #13 (Best Practices Online Library on Performance Monitoring and Management).

<b>Project No./Title</b>	<b>#17: Operations Performance Measures for Optimizing Operational Strategies</b>
<b>Subject Area</b>	Performance Management
<b>Project Type(s)</b>	Outreach/Coordination, Research/Implementation, Technical Assistance
<b>Time Period</b>	2015 to 2016

**Project Objective:** Document operations performance measures and analyses techniques best suited for optimizing operational strategies.

**Deliverable:** Guidebook.

**Project Lead:** HOP.

**Project Description:** A number of performance measures are necessary to understand the operation of the transportation system and the effect of operational strategies. There is a need for guidance that helps identify which operations performance measures are best suited for optimizing specific operational strategies.

In addition to specific measures, there is also a need to better understand what types of analyses are most helpful for understanding the impacts of specific operational strategies. For example, if an analyst performs a before-after study after the installation of an operational treatment and sees little or no impact, what other data or analyses could shed light on the particular situation? This project will help practitioners understand what performance measures can be used to optimize operational treatments in these situations.

This project will synthesize lessons learned from case studies as well as from the literature to provide guidance to practitioners.

OPMM Road Map Project Coordination: Project #13 (Best Practices Online Library on Performance Monitoring and Management); Project #14 (Synthesis and Guidance on Evaluations of Operations Strategies); Project #15 (External Factors in Performance Monitoring).

<b>Project No./Title</b>	<b>#18: Measures for Internal FHWA/USDOT Dashboards, Reports, Plans, etc.</b>
<b>Subject Area</b>	Operations Performance Measures Coordination
<b>Project Type(s)</b>	Outreach/Coordination, Policy/Internal
<b>Time Period</b>	2014 to 2018

**Project Objective:** Provide operations performance measures for internal FHWA/USDOT dashboards, reports, plans, etc.

**Deliverable:** Performance measures for internal FHWA reports.

**Project Lead:** HOP.

**Project Description:** There are a number of FHWA internal reports that require operations performance measures as input. This is an on-going activity in the OPMM Road Map to supply these measures to these FHWA Offices and Programs for their reporting purposes.

This project will be performed as an internal activity of the FHWA OPMM Program.

OPMM Road Map Project Coordination: Project #7 (Produce Urban Congestion Report).



U.S. Department of Transportation  
**Federal Highway Administration**

FHWA-HOP-14-012