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# FHWA Performance Reporting

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## Part two of two

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## Final Report

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# 1.0 Introduction

For public agencies, the ability to connect to and communicate with the public is no longer a “good” thing to do, it is an absolute necessity if the public agency is to develop and retain the credibility that is critical to accomplishing its mission. The public may not use the same language as transportation professionals, but performance is what the public cares about. The key questions they want answered are, what is being spent and what has it bought? Has there been an improvement and is it an improvement that matters? While there are many formats for presenting answers to these questions – text, spreadsheets, graphs, even pictures – the complicated trick is getting it right. This is information design and when information design is done well, it grabs attention and educates more effectively than other approaches.

The Federal Highway Administration (FHWA) has been working for several years to prepare their organization – as well as State departments of transportation (DOT) and metropolitan planning organizations (MPO) – for transitioning to performance management of the Federal program. The FHWA is working with the American Association of State Highway and Transportation Officials (AASHTO) and its Standing Committee on Performance Management (SCOPM) in a coordinated effort to define the limited number of measures appropriate for a national performance system. The FHWA also has created a partnership with the Federal Transit Administration (FTA), the American Public Transit Association (APTA), the National Association of Regional Councils (NARC), the Association of Metropolitan Planning Organizations (AMPO), and AASHTO to host three very effective national workshops that have been used to define a performance-based planning and programming process. The partnership is now engaged in holding regional workshops to continue the process of preparing DOTs and MPOs for transitioning to a performance management system.

With Congress’ recent passage of Moving Ahead for Progress in the 21st Century Act (MAP-21) and its numerous performance reporting requirements, one critical next step on the path of fully implementing a national performance program is to build the foundation for national performance reporting. Effective communication of data – engaging audiences, promoting understanding, encouraging reuse and speeding decisionmaking – is essential to converting findings to action. Converting findings to action is the ultimate goal of a performance reporting system and this foundational project gets us started down that path.

FHWA has initiated the Performance Reports Project to build the foundation of a performance reporting system. A performance-driven approach focuses attention on results and puts the tools in place so that FHWA, transportation stakeholders,

elected officials and the public can determine if FHWA's stated goals of providing a safe, reliable, sustainable highway system are being met.

The Final Report for the FHWA Performance Reports is divided into two parts. In Part I of the Report, the study team looks at the keys to reaching an audience, summarizes audience responses to transportation performance reports, and concludes with a recommended model for performance reporting. Part II of the Final Report (this document) covers issues internal to FHWA including methods to expand performance reporting for internal purposes, an assessment of current performance reporting assets and effectiveness, and a phased performance reports implementation plan.

## 2.0 Advancing Internal Performance Reporting

In addition to externally focused performance reporting, FHWA wants to enhance their internal performance reporting capabilities. An internal report could include greater organization and technical detail, such as additional transportation indicators associated with the national performance measures; program output measures and/or program effectiveness measures to show what is being done to improve performance and how well it is being done; and possibly program activity measures. These measures could be useful particularly for FHWA Division offices when discussing performance with State DOTs. The report could also include data from, and reference to, internal program data analysis tools.

The audience for internal reports includes internal Division Administrators, managers and program analysts. Internal reports may include more data than the external performance reports with narrative describing an assessment of the measures and impacts for transportation decisionmakers, similar to the *Washington State Gray Notebook* and *Minnesota Transportation Performance Report*.

It is hoped that Division Administrators would find such reports useful for discussions with their State DOT peers and that Program Offices and Division Offices would find the reports useful for looking at their own performance, contributions, and direction setting.

### 2.1 ONGOING INTERNAL REPORTING ACTIVITIES

It should be noted that at the time of this study, there are several ongoing activities that impact internal performance reporting at FHWA.

First and foremost, FHWA is currently implementing MAP-21 transportation authorization act and is in the middle of a rule-making process to define the transportation performance measures as required by MAP-21. The rule-making is important and is a confidential activity that makes it impossible for Program Offices to state their preferences for performance measures, whether internal or external. This performance reporting project was initiated prior to MAP-21 passage, not in response to MAP-21 and is not intended to have any bearing on the rulemaking. Its purpose is to inform FHWA on how best to report performance in a compelling, clear, and understandable format not to determine the measures to be used or to set targets. However, the deliverables from all of these tasks will likely be helpful to FHWA as they begin the implementation of MAP-21's performance reporting elements.

Secondly, there is currently a study underway at FHWA to create a data visualization tool which may prove useful in enhancing internal performance reports. The recommendations of that study will likely impact internal performance reporting and will need to be factored into any recommendations.

Given the ongoing activities and their sensitivity, this study is stopping short of offering specific templates for internal performance reports which would by necessity include detailed performance measures and data reporting mechanisms. Instead, the study team has taken the research of related to external performance reporting (findings of the audience outreach and feedback, the design of the external report, consideration of the production model) and applied these to the concept of an internal FHWA performance report and recommends principles that should be used to shape internal performance reports in the future. It is the hope of the study team that these principles will provide direction when FHWA is ready to advance new internal performance reports.

## 2.2 RESULTS OF INTERNAL INTERVIEWS

To better understand the needs of Program Offices, the study team conducted a series of interviews. 14 interviews were conducted in October through December of 2012 with a total of 18 participants. Three of the interviews included Division Administrators.

Questions focused on the following topics:

- The role of the Office related to performance reporting.
- Current performance information and resources including
  - Data collected
  - Data sources
  - Data maturity
- Preferences for receiving information.
- Opportunities for new data collection and/or reporting.
- Potential uses of internal performance reports.
- Ongoing initiatives related to performance reporting.

The results have been organized into Table 2.1 for easy review. Note that the 11 FHWA Central Office interviews are listed first (in alphabetic order by Office) followed by a single-page summary of the three Division Administrator interviews.

Table 2.1 FHWA Interview Summaries

Office (Participants)	Role Related to Performance Reporting	Current Performance Information & Resources	Preferences for Receiving Info / New Data Opportunities	Ongoing Initiatives
Asset Management and Pavement Technology (Steve Gaj)	<ul style="list-style-type: none"> <li>Promotes asset management principles and looks at infrastructure condition (primarily pavements and bridges).</li> <li>Involved in rule-making for asset management and rule-making part of the pavement performance measure.</li> </ul>	<ul style="list-style-type: none"> <li>Related to asset management, states at minimum have to address pavement and bridge condition.</li> <li>For pavement condition it is important to have International Roughness Index (IRI), as well as elements like cracking, rutting, and faulting.</li> <li>Recent I-90 pilot corridor study showed that in that case HPMS IRI was pretty consistent, rutting was okay, faulting has some issues but can be addressed, cracking had significant issues.</li> <li>With pavement item, do not need live data, but prefer more frequently than 3-4 years, happy with annual basis, issue would also come up with sampling vs. continuous.</li> </ul>	<ul style="list-style-type: none"> <li>Like a wide variety of data viewing options, depends on user and context of how they are using it, need to look at different program areas and geographies.</li> <li>AM requirements have State DOTs looking long-term, not just at snapshots, preservation has to be a part of this issue, need to consider whole lifecycle.</li> <li>Ideally would like pavement values that best represent structural integrity and resources needed to provide desired performance.</li> <li>Would like information such that the State DOTs can explain their strategies (for example, CA is behind in bridge deck condition, but that is because their priority has been seismic retrofitting), need to look at total picture of how DOTs are managing their assets and what the numbers are showing.</li> </ul>	<ul style="list-style-type: none"> <li>Moving ahead with MAP-21 requirements for AM, and State DOTs are looking at data on their other physical assets (as identified by States potentially including tunnels, culverts, ITS-related, signage, others), will be new data collection and analysis area at federal area, level of maturity will depend on State.</li> <li>Transportation Asset Management Plan Pilot Project.</li> <li>Pavement Data Collection Guide.</li> <li>Pavement Management Roadmap Marketing Plan.</li> <li>Pavement Health Track Tool.</li> <li>Ongoing discussions with Transportation Asset Management Expert Task Group.</li> </ul>

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Bridge Technology (Wen-huei Yen, Douglas Blades, Everett Matias)	<ul style="list-style-type: none"> <li>Office of Bridge Technology is dedicated to working together with partners within FHWA and in State, local, and tribal governments; industry; and academia; and among other stakeholders to provide the Nation with safe, secure, reliable, and efficient highway bridges and tunnels.</li> <li>Key components of the Federal-aid bridge program include the National Bridge Inspection Program, which encompasses the National Bridge Inspection Standards (NBIS) and the National Bridge Inventory (NBI).</li> </ul>	<ul style="list-style-type: none"> <li>Collect NBI (more than 100 items for each bridge), info comes from the States.</li> <li>NBI contributes to a lot of analyses, most documents shared with public are drawn from NBI, NBI used for requests from Congress and the Conditions and Perform (C&amp;P)ance Report.</li> <li>NBI is very mature, has new QA/QC process, data have consistently improved, high level of confidence.</li> </ul>	<ul style="list-style-type: none"> <li>MAP-21 has given directive that 2014-2015 will start collecting element level data for NHS, currently only about 8 states not doing element level inspections, so anticipate high level of adoption, will continue to use NBI for non-NHS, in a few years Bridge will start collecting element level data, element level data will be modification to NBI.</li> <li>Nice feature that they'd like to have are more detailed association with costs.</li> <li>Internal reports may be useful, possibility to enhance capabilities.</li> <li>Would be interested in seeing cross-cutting reports that capture authorized programs and how their spending impacted performance.</li> </ul>	<ul style="list-style-type: none"> <li>Currently engaged in rule-making.</li> </ul>

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Directors Field Services and Program Management (Dan Fodera)	<ul style="list-style-type: none"> <li>Mainly focused on management, oversight, and risk information about programs and agencies, collect lots of data in these arenas.</li> <li>Primarily look at national level findings, not tracking detailed performance.</li> <li>Track and conduct spot-checks on projects as part of oversight activities, information is reported to agency dashboard, have oversight goals trying to achieve.</li> <li>DFS not initiating conversations with State DOTs.</li> </ul>	<ul style="list-style-type: none"> <li>Data are housed in Risk and Review Response System (aka Risk and Review Tracker), which provides access to FHWA staff only and serves as a library for program and process reviews (evaluate given part of program for compliance, effectiveness, etc.)</li> <li>DFS also provides a learning tool to model reviews after (example of DBE effectiveness review), allows each office an internal tracking tool where they can see progress on recommendation.</li> <li>Each unit/program identifies top risks annually, they are rolled up nationally with elements like likelihood, priority, responses, etc., each Division Office does risk assessment as part of annual review, includes risk response elements.</li> </ul>	<ul style="list-style-type: none"> <li>Additional measures – would be important to break down into component parts (example of crash data enabling reviews of causes, for mobility or reliability needs to enable better incident management through specifically targeting non-recurring congestion).</li> <li>If project delivery time appeared as a risk, then may target review.</li> <li>Have talked about developing statistical approach to assessment of oversight (identify confidence levels and margin of error, rather than just looking at number of reviews).</li> </ul>	<ul style="list-style-type: none"> <li>Looking at “spot checks” to improve program reviews.</li> </ul>

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Environment (Harlan Miller)	<ul style="list-style-type: none"> <li>Do not use a lot of planning specific performance measures, more process-oriented, feed process data up in C&amp;P Report.</li> <li>On environmental side, lots of interest in reducing time taken for EIS, HEP tracks EIS progress and duration with goal of reducing timeframe, publish quarterly “where are we at?” report, try to highlight problem EISs and work with DAs to check progress.</li> <li>Can do process reviews, peer exchanges, could review the implementation with certain States.</li> <li>Have 52 Division Offices, history with fiscal constraints leads to different Field Office processes and ways of handling, need to have consistency on implementation of performance measurement.</li> </ul>	<ul style="list-style-type: none"> <li>Have certification review database on TMA areas of 200,000, keep database up to track them, can extract data from database, can search by topic, identify weaknesses, corrective actions (reviews done on 4-year cycles).</li> <li>Certification Review database helpful for performance monitoring, have started with development of internal handbook, have added chapter for performance-based planning for MPOs, use database to search MPOs on whether they are doing things related to performance management, have used 4-5 as examples.</li> <li>Also have Air Quality report on CMAQ back to Congress, summary of all projects that have been implemented, costs vs benefits (in terms of emissions), state by state submittal, extract each year and send up to Congress, lists all CMAQ projects, costs and benefits.</li> <li>Data confidence is a huge issue, quality and consistency of data is important, need to foster some consistency in standards for data to establish confidence.</li> </ul>	<ul style="list-style-type: none"> <li>Much of it needs to be defined, but would be helpful to look state-by-state, GIS-based layer system would be helpful.</li> <li>Using maps would be helpful in developing strategies, would need to be state specific, would be helpful to even pull up assets.</li> <li>Prefer graphical interface.</li> <li>Should be made available to everybody (the public).</li> <li>Some of UDOT’s work with UPlan is very interesting, ability to pull up maps is helpful.</li> <li>Prefer electronic format, would like to see electronic collection and submission.</li> <li>Need to be aware of sensitivity to comparisons.</li> <li>Divisions have stewardship plans, but would be helpful to have baseline system performance information, items like pavement and bridge condition and congestion, those data would be helpful in identifying weak points and strategies to focus on them, not enough now to support that.</li> </ul>	<ul style="list-style-type: none"> <li>Developing a lot of tools related to performance measurement including: <ul style="list-style-type: none"> <li>Guidebook for performance-based planning</li> <li>Guidebook for model plans that are performance based</li> <li>Training for field offices and states and MPOs</li> <li>Field planners handbook</li> <li>TMA certification handbook</li> </ul> </li> <li>Would like to look more at performance based STIP and TIPs.</li> <li>Conducting several peer exchanges related to performance based planning (such as with CMAP in Chicago).</li> <li>Having some states request state-specific workshops, which allows them to invite MPOs and focus on state-specific issues.</li> </ul>



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Federal Lands Highways (Terry Haussler)	<ul style="list-style-type: none"> <li>• FLH is a \$1 B program (2.5% of federal spending), Federal partners used to be Federal Parks, State and county partners, Indian Reservation Roads Program (prior to Oct 1), now include USACE, Forest Service, and Bureau of Land Management.</li> <li>• Do planning, design, and construction for access to Federal Lands with a primary interest in the building and design of projects.</li> <li>• From performance management standpoint, need to consider road and bridge condition and safety.</li> <li>• FLH reports performance for the C &amp; P Report.</li> </ul>	<ul style="list-style-type: none"> <li>• Data availability is a challenge as:               <ul style="list-style-type: none"> <li>– Road system is very large and includes overlap with local and county roads.</li> <li>– Many roads are unpaved (about 90%).</li> <li>– Crashes often go unreported.</li> <li>– In some cases there is limited faith in data accuracy.</li> </ul> </li> <li>• Have some good data on road condition from Park Service and some collected with Automatic Road Analyzer (ARAN) Van.</li> <li>• Have good bridge condition data.</li> <li>• Track project delivery, take project management very seriously, use very sophisticated measurement in that area, feel very strong about ability.</li> </ul>	<ul style="list-style-type: none"> <li>• C&amp;P report provides a good model for reporting preferences.</li> <li>• Better data reporting, along with the definition of a smaller subset of roadway inventory, might support better tracking of return on investment.</li> </ul>	<ul style="list-style-type: none"> <li>• Putting together team to help with data collection.</li> <li>• Dept of Interior is working on larger incident management database.</li> <li>• Looking at 2-year window of MAP-21 as an opportunity to establish baselines, advance data with partners.</li> <li>• There is interest in seeing FLH as more of a testbed of project delivery techniques.</li> </ul>

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Freight Operations (Ed Strocko)	<ul style="list-style-type: none"> <li>Freight has three main performance-related activities: the Freight Analysis Framework (FAF), the Freight Performance Measures Program (FPMP), and the Intermodal Connector Assessment Tool.</li> <li>Monitor IHS, border crossings, and intermodal connectors as primary areas of interest.</li> <li>Try to focus on user rather than owner, system rather than State.</li> <li>Check on State freight plans, look into how many have them (and MPOs), set internal targets, also look at private sector advisory committees.</li> </ul>	<ul style="list-style-type: none"> <li>FAF uses the Commodity Flow Survey (CFS), updated every 5 years, use for longer and larger national analysis but do provisional analysis annually and release Freight Facts Report.</li> <li>FAF good at national and regional level, falls apart at county level, not as valuable for project level decisions.</li> <li>FPMP relies on probe data, fuels Leadership Dashboard indicators.</li> <li>For Leadership Dashboard, use two measures of reliability of freight on nationally significant corridors using buffer index (average of 25 corridors), freight efficiency index (bottlenecks, urban congestion, border crossings, intermodal connectors [top 15]).</li> <li>Intermodal Connector Assessment Tool, share with States and encourage them to use it, gives condition on intermodal connectors, push to get additional adoptions (issue of intermodal connectors often not owned by the state, freight becomes secondary issue).</li> <li>Freight measures are typically on a quarterly basis.</li> </ul>	<ul style="list-style-type: none"> <li>Figuring out right level is key (project or system).</li> <li>Lots of external variables, would be great to understand more tied to performance data.</li> <li>Developing reasoning behind economic competitiveness is a challenge.</li> <li>Very interested in corridors (both sub-State and multi-State).</li> <li>Interested in key supply chains / industries / commodities.</li> <li>Transport Canada has fluidity measure, would be interested in seeing further developed.</li> <li>Would like to develop multi-jurisdictional measures for corridor work.</li> <li>Need local freight data to supplement FAF and other data resources.</li> <li>National performance measures need to be multimodal and multidimensional.</li> </ul>	<ul style="list-style-type: none"> <li>Expanding probe data uses, data sharing.</li> <li>FPM Web tool allows public to play with data (older generation of data), gives average speed by 3-mile IHS segment, can get average speed back to 2006 (yearly, average, down to day), not sure if new dataset will evolve in same platform or if it may include a more visual platform (graphical FAF tool).</li> <li>Looking at suite of research that may include multi-jurisdictional measures for corridor, fluidity, arterial data, state use of probe data to investigate before/after investment decisions, primer on use of performance measures, workshops, economics and performance measures, supply chain research, next generation of FAF.</li> </ul>

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Finance (Donna Jones)	<ul style="list-style-type: none"> <li>• Work with the data as a collector and sharer of data, includes Congressional offices, program offices, divisions.</li> <li>• FHWA uses project management system for construction, maintenance, research, Fiscal Management Information System (FMIS), mandated for use for all State DOTs, need to make data available to Division Offices.</li> </ul>	<ul style="list-style-type: none"> <li>• FMIS includes authorization dates, close-out dates, expenditure dates, raw project data (includes both required and optional fields).</li> <li>• Certain fields in the FMIS allow for state comparison but data completeness (optional fields) impacts reliability of comparisons.</li> <li>• Required field data are complete but accuracy falls on States and Division Offices.</li> <li>• Can run multi-faceted queries but need to consider data completeness, caveats, etc.</li> <li>• FMIS focuses on obligations, not expenditures.</li> </ul>	<ul style="list-style-type: none"> <li>• Design of new program will address some additional needs.</li> <li>• It is a challenge to add required fields to FMIS as it puts a data collection burden on States.</li> </ul>	<ul style="list-style-type: none"> <li>• Working on design of updated FMIS program.</li> <li>• New version may include geospatial elements.</li> </ul>

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Operations (Rich Taylor)	<ul style="list-style-type: none"> <li>For Program Office, look at major metro areas in coordination with division offices, track project implementation such as quick clear policies, incident clearance, posted travel times.</li> <li>Look at internal performance by gauging level of adoption of encouraged programs and techniques, can then direct resources towards low area of adoption, adoption levels prove to be a valuable internal performance metric.</li> <li>Work with Sstates on performance metric self-assessments.</li> <li>Want State and MPO partners to understand how their systems are performing and how projects impact the system and eventually lead to improved investment decisionmaking.</li> </ul>	<ul style="list-style-type: none"> <li>From the standpoint of Office of Operations, for internal reports, use Urban Congestion Report (for past 5 years), using data from TMC, various archives, ITIP (Navteq, Traffic.com, etc), currently only get data in 19 urban areas.</li> <li>Report Travel Time Index, Planning Time Index, temporal congestion, available on Operations website, originally more research-oriented, but eventually started reporting internally, measures are based on real data, they are limited geographically but valuable for trend analysis.</li> <li>For actual operations, real-time is important. But from a reporting standpoint, annually is generally acceptable.</li> <li>Current data archived from TMCs have varying levels of quality, but if we look at private sector vehicle probe data, ground-truthing has shown it to be reasonably accurate.</li> <li>Used to rely on Travel Time Index, but had limited implication on planning-related decisions, now are looking more at corridor-level measures because of closer link to investment (projects).</li> </ul>	<ul style="list-style-type: none"> <li>Would like more data on external factors that impact performance (job creation, the economy, etc.), want to have a more detailed understanding of cause and effect, what can be influenced by funding.</li> <li>Measures will never tell the whole story, need to look at the whole story to get performance.</li> <li>Division Offices' agreements with State DOTs are starting to explore reliability measures, some discussion about what level of reliability reporting is needed.</li> <li>May get some useful reliability measure guidance out of rule-making.</li> <li>Whatever MAP-21 measures are for system performance and/or congestion will be of interest to the Office of Operations.</li> </ul>	<ul style="list-style-type: none"> <li>Planning to expand Urban Congestion Report to all metro areas over 1M in population (about 52, which would be an expansion over the current 19).</li> <li>Looking at expanding capabilities around SHRPII reliability metrics.</li> <li>Looking at external factors.</li> <li>Probe data may enable much greater analysis on corridor level.</li> <li>Will look to provide support related to MAP-21 requirements.</li> </ul>

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Performance Management (Connie Yew)	<ul style="list-style-type: none"> <li>Performance Management is in charge of stakeholder engagement for rule-making process, not currently targeted towards specific measure data collection, more focused on reporting results, encourages use of performance measures.</li> </ul>	<ul style="list-style-type: none"> <li>DFS (Directors Field Service) dashboard details projects as well as some State-level indicators.</li> <li>Policy manages Leadership Dashboard, includes quarterly report of pavement condition.</li> <li>For most part, measures are not readily available on a frequent basis, most are annual, some are quarterly, if output-based (such as number of projects) then can be updated more frequently, more frequently than every year will be a challenge for likely MAP-21 measure requirements, annual availability is better than every two years, allows for strategic adjustment.</li> <li>Tend to use national level, though effectiveness depends on the measure, for example the measure on truck movement is not helpful to see national averages, whereas pavement condition on a State level may make sense.</li> </ul>	<ul style="list-style-type: none"> <li>Have been trying to make connection between performance measures and level of investment, that is something they would be interested in understanding better, currently not a great way to understand on a project-by-project basis how much is being invested in each area (such as safety, congestion, etc).</li> <li>Performance Management has shared (as part of development process for the next generation of FMIS (Future FMIS)) that they would like better linkages between level of investment and performance.</li> <li>Looking for many layers, for example, for safety if you can get number of fatalities and rates there could be subcategories</li> <li>If you want to manage the system, may be necessary to break down by state, need to be aware of the sensitivities.</li> <li>Measure is just one piece of the story, need to provide underlying reasoning, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Will be communicating with Program Offices to coordinate on measure development as part of the rule-making.</li> </ul>

Office (Participants)	Role Related to Performance Reporting	Current Performance Information & Resources	Preferences for Receiving Info / New Data Opportunities	Ongoing Initiatives
Policy (Tianjia Tang)	<ul style="list-style-type: none"> <li>Office does ranking and does publish rankings comparing states, challenges them to improve</li> <li>ARRA (Recovery Act) data tracking is a responsibility of the Policy Office, project type and project completion, need to understand why some states take significantly longer to implement projects</li> <li>Accuracy and timeliness of reports is an important data point to track</li> </ul>	<ul style="list-style-type: none"> <li>Highway Performance Monitoring System (HPMS) is a large data resource</li> <li>Track financing data, federal expenditure and income</li> <li>Track registered motor vehicles and drivers license</li> <li>Traffic volume and trend information (VMT), “pulse for our nation’s highways”</li> <li>Also collect gallons of motor fuel and diesel consumption, often from State agriculture departments or other departments, use as indicator of where we are headed, supports revenue and emissions projection</li> <li>Have very high confidence in the data, mainly because there is an established history and process, aware of arguments that data quality could be better, but very confident in degree of accuracy</li> <li>Most data comes from the states but federal aid dollar amounts are tracked internally</li> <li>TTI Urban Mobility Report is valuable</li> </ul>	<ul style="list-style-type: none"> <li>Data currently is on annual basis (excepting motor fuel consumption and VMT), but would like to see greater frequency to support analysis and accuracy</li> <li>Pavement is important (public is very aware) but could be improved with increased state cooperation</li> <li>Public knows congestion and pavement condition, but FHWA could do a better job characterizing that value</li> <li>Based on monthly traffic data and annual VMT data, believe that travel behavior is fundamentally changing but it is difficult to analyze without more data</li> <li>Short on information on travel behavior. This is a critical time with fundamental changes but not enough social demographics info</li> </ul>	<ul style="list-style-type: none"> <li>Data Integration Effort – offices talk regularly but have their own data, working to integrate and link all data, will have benefit of having data ready to go, reduce data collection budgets, targeting completion in a year</li> <li>Data Visualization – working to improve the presentation of data, about 80% has been completed</li> <li>Policy working with Volpe to generate VHT to better capture delay, generating tool to capture and report delays</li> <li>Tough to evaluate performance and behavior on corridor-level, currently trying to evaluate different corridors and make traveler behavior comparisons</li> <li>Working to garner funding for NHTS in the 2014 timeframe</li> </ul>

Office (Participants)	Role Related to Performance Reporting	Current Performance Information & Resources	Preferences for Receiving Info / New Data Opportunities	Ongoing Initiatives
Safety (Keith Williams)	<ul style="list-style-type: none"> <li>• Monitor performance, mostly relying on crashes and serious injuries.</li> <li>• Other measures Safety collects and uses include: roadway elements (model inventory, not collected at national level but work with states to see what they have), index of nine safety countermeasures, interested in crash types (pedestrian, speed-related).</li> <li>• Embracing more of a systemic approach to identify areas where crashes may or may not have occurred and proactively address infrastructure issues, systemic improvements specifically called out in MAP-21 as eligible for Highway Safety Improvement Program (HSIP) funds.</li> <li>• Moved to online reporting tool for HSIP, hoping to see more and more states using it.</li> </ul>	<ul style="list-style-type: none"> <li>• Safety data (fatalities and exposure) have been around for many years, well recognized, have great data coverage, get fatalities from FARS (great data provider though there is a data lag), draw exposure from HPMS to get VMT and get fatality rates.</li> <li>• Issue is that fatalities is a small dataset, fatalities are fairly random, doesn't give great causal data.</li> <li>• Serious injury is not reported nationally, NHTSA does annual estimate on serious injury crashes, much broader dataset but problems with definition consistency among States.</li> <li>• NHTSA's Crash Outcome Data Evaluation System (CODES) has been very helpful but data collection is difficult and future funding is in question, has been mostly supportive in research areas.</li> <li>• Use State data on nine safety countermeasure index, only used internally for DOT purposes, helpful for infrastructure, not necessarily mature.</li> </ul>	<ul style="list-style-type: none"> <li>• Would want State programs to increase availability/reliability of data broken down by contributing factors (age, speed, etc), there is maturity but varies from State to State.</li> <li>• Thinking of external reporting tool, would be good to summarize data elements to allow for state-by-state comparisons.</li> <li>• In terms of format, would like to see data tool that allows for queries, is geocoded, spreadsheet/database format that allows for some analysis, current reporting mechanisms are very useful.</li> <li>• Would like to move into more serious injury data collection.</li> <li>• Would be interesting to know numbers of emergency responses issued through Onstar-type propriety in-vehicle systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Some NCHRP projects (17-57, 20-24(37)K) are addressing the issue of data reporting on serious injuries, ongoing survey of how states are collecting serious injury data and any medical linkages, will feed future recommendations / standards for serious injuries</li> <li>• At some point in the future would be great if every crash were available</li> <li>• Would like to see availability and location of emergency care elements (some inventory projects underway: MICE Model Inventory of Care Elements), would enable some target-setting to increase availability of rural emergency care elements</li> </ul>

Office (Participants)	Role Related to Performance Reporting	Current Performance Information & Resources	Preferences for Receiving Info / New Data Opportunities	Ongoing Initiatives
Division Administrators (Wes Bollinger, LA) (Tom Smith, WV) (Kevin Ward, MO)	<ul style="list-style-type: none"> <li>• Evolving and emerging role, leadership is looking at Division offices to advance conversation and coordinate with States.</li> <li>• Biggest role is as a catalyst for change in using data to direct resources (such as staff), focusing on getting the biggest benefits, addressing risks, and assisting the states in reaching and exceeding their goals.</li> <li>• Regularly engage with State DOTs on performance management, increased since passage of MAP-21, a lot of overlap between Federal and State partners on performance management.</li> <li>• Need to make opinion valuable to State partners.</li> </ul>	<ul style="list-style-type: none"> <li>• Use measures to improve efficiency of processes.</li> <li>• Have compliance and stewardship duties, stewardship includes effective and efficient use of federal funds, is key area for performance management, allow states broader flexibility in resources.</li> <li>• MO produces a customer report, focus on performance of division (not as much the system), look at fatalities, how consistently internal processes are being managed.</li> <li>• Assist State partners in benchmarking, knowing where they sit versus other States (not showing them who, but where, they are versus the average).</li> <li>• Performance needs to be formulated into reports that allow us to discuss and agree on actions (not focus on how, more focus on end result).</li> </ul>	<ul style="list-style-type: none"> <li>• Would like to see visually effective messages, trends, context to enable interpretation, want to clearly see need for action.</li> <li>• Need actionable data, in some cases need to focus on outcome not output.</li> <li>• Important to know economics of projects, cost vs. benefits, cause and effect.</li> <li>• Management metrics are very important.</li> <li>• Shouldn't design performance reports for front end of the curve, concern that some lack of understanding about how disparate the States are.</li> <li>• State by State comparison is necessary but need the context so it is not distortive or misleading.</li> <li>• Recognize that each State has different data needs.</li> <li>• Like interactive tools, want capacity to do own analysis.</li> <li>• Would like automated centralized database system (easy to run reports).</li> <li>• Need regularly updated data, especially on finances (monthly).</li> </ul>	<ul style="list-style-type: none"> <li>• Adjustments being made within office by replacing position with greater program management analysis skills (tool development and data manipulation)</li> <li>• Development and refinement of performance management review processes</li> <li>• Updating stewardship and oversight agreements</li> <li>• More visualization of performance data, especially relying on GIS tools, geocoding, project outcomes</li> </ul>



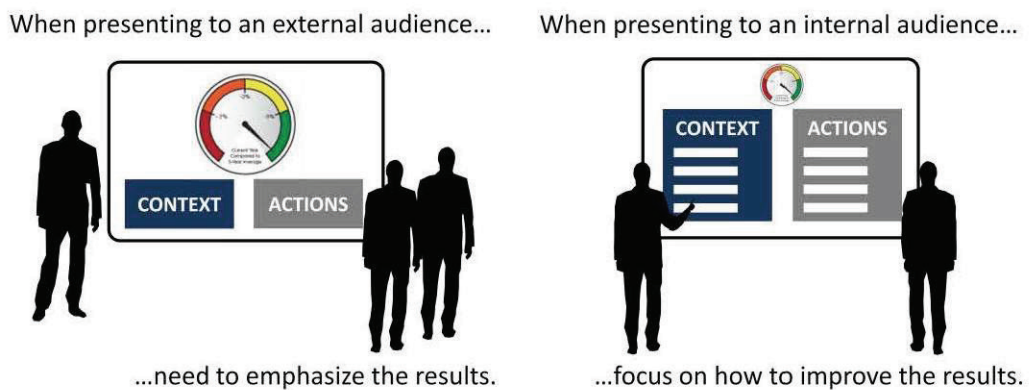
Some common themes emerged based on the interview results. These include:

- **Current Data Issues** – The data issues vary from concerns with frequency, accuracy, maturity, and need for more integration.
- **Need for Additional Data** – A number of offices expressed an interest in data not currently available to provide greater understanding of the measures being tracked. For example, the Safety Office is interested in data about crash contributing factors, the Bridge Technology Office is interested in being able to break available data down into component parts, the Operations Office expressed an interest in more data on external factors like job creation and the economy.
- **Rule-Making** – Many offices indicated that they are actively engaged in the current performance measures rule-making and were hamstrung in terms of what they could discuss.
- **Tool Development and Initiatives** – Many offices are actively engaged in developing tools or working on initiatives to aid the performance management effort. Some examples include the Transportation Asset Management Plan Pilot Project, the Pavement Data Collection Guide, the Pavement Health Tracking Tool, a guidebook for performance-based planning, a guidebook for model plans that are performance based, training for field offices, states and MPOs, a Data Visualization project and a project with Volpe to generate VHT to better capture delay.
- **Desire for Actionable Data** – The Division Administrators stressed the need for data that helps inform the actions to be taken. They are interested in outcomes. Performance measurement should not be the end goal, but should be a helpful indicator on a path to better system performance.

## 2.3 PRINCIPLES FOR INTERNAL PERFORMANCE REPORTING

Internal performance reporting serves a very different purpose than external performance reporting. As such, different priorities must be emphasized. As shown in Figure 2.1, the external reports designed as part of this project emphasize showing the results of performance and providing the context and description of actions in order to enable the audience to best understand the performance and its significance.

**Figure 2.1 External vs. Internal Priorities**



In internal reporting, it is assumed that the presenter/audience divide is smaller, and both the presenter and audience are likely involved in conversations about how to improve performance. External performance reporting is about understanding where the needle is. Internal performance reporting is about understanding how to move the needle.

Internal performance reporting requires a much greater emphasis in two areas: context and actions.

### **Adding Greater Detail to the Context**

Internal decision-makers will need much greater detail on the context in which performance decisions are made. The best example of this principle comes from the Office of Infrastructure.

During the interview with the Office of Infrastructure, they made it clear how important context is when discussing performance. The example given regarded bridge deck condition with the State of California. In this case, California has placed a significant emphasis on seismic retrofitting and in their pursuit of this important State objective, have invested less than their peers on deck maintenance and rehabilitation. It is extremely valuable for FHWA to understand these unique state (or regional) level factors in order to have an informed and productive discussion rather than making overly simplistic assumptions about performance.

An effective internal performance report needs to consider the impacts of factors unique to each state such as:

- State and local plans and priorities.
- Economic activities influencing transportation needs.
- Demographic influences on transportation needs.
- External elements such as weather.
- Historical investment and decisionmaking priorities.

- Geography and key transportation linkages.

There is no single easy template to accomplish this. Rather, internal performance reports should be developed in a way that allows the context of the particular measure to be presented and understood.

### Adding Greater Detail to the Actions

Discussions between transportation professionals should move quickly beyond the current performance and into a discussion as to how the performance can be improved. An effective internal performance report will provide sufficient detail that actions undertaken in the past, currently underway, and planned for the future can be understood and analyzed.

Both FHWA's Office of Operations and Office of Safety have an effective and mature model in place to facilitate discussion about actions to improve performance. Both Offices measure the adoption levels of key countermeasures which they recommend to State and local partners as effective mechanisms for improving performance.

The Office of Safety defines nine Proven Safety Countermeasures, shown in Figure 2.2. They encourage their partners to "continue to strengthen their evidence-based decisionmaking processes, as highlighted in the Highway Safety Manual, and systemic planning approaches to make improved safety investment decisions." The Office of Safety takes on the role of "continu[ing] to provide guidance and technical assistance to encourage these practices. We will also continue to research, identify and advance proven safety countermeasures and to provide those countermeasures to you and our partners so they can be integrated into this approach and used to help save lives and prevent serious injuries."<sup>1</sup>

**Figure 2.2 Screenshot of Proven Safety Countermeasures**



<sup>1</sup> [http://safety.fhwa.dot.gov/provencountermeasures/pc\\_memo.htm](http://safety.fhwa.dot.gov/provencountermeasures/pc_memo.htm)

Tracking the historic levels of adoption of these Proven Safety Countermeasures would prove valuable when discussing safety performance. The clearly defined countermeasures provide a helpful blueprint for states and local partners

Not all program offices and performance measure areas have such maturity. Safety and Operations provide an effective model for development in other performance measurement areas, though, and over time the development of specified recommended programming directions to improve performance will greatly facilitate collaborative action.

In summary, an effective internal performance report needs to include:

- Historic actions taken to improve performance in specific areas and their results.
- Ongoing actions, their level of maturity, and the current result.
- Planned future activities and their anticipated results.
- Level of adoption of specific programs or countermeasures that are formally or informally recommended for improving performance in specific areas.

The development of the actions portion of a detailed internal performance report template will require detailed conversations with each FHWA Office charged with monitoring specific performance measures.

Note that the promotion of specific countermeasures cannot be a “one size fits all” approach, as each state will differ. Conversations with several Division Administrators made it clear that internal reports that push a national model of success at the expense of State-level decision-making will not be well-received. State DOT partners are interested in discussing actions but prefer to have control over their directions.

## 3.0 Performance Report Content Management

The model for performance reports (introduced in Part I, Section 4) is based on solutions to address the audience needs and preferences including:

- Focusing on the customer, with localized and personalized content.
- Using narratives connected to performance.
- Delivering headlines and simple explanations.
- Highlighting existing content when available.
- Starting simple and allowing drill-down.

Based on everything learned through this study about audience interests and preferences, it is recommended that everything about the report, its format, its narrative language, be customer-centric. Material should be developed with the a view to how the transportation user is impacted and to what the transportation user wants to know. It is important that the site not be “about FHWA” but rather that it is about transportation and how individuals are impacted and benefited by transportation.

The recommended report relies heavily on non-traditional, web-based production steps. A traditional model for a report involves a cycle of researching, developing content, revising, and publishing. The web-based platform, with an emphasis on freshness, regularly updated content and data, and the publishing of research developed by external parties, requires a detailed content management approach.

This Section presents a model for the management of performance report content in a web environment, a necessary step to make the recommended demonstration website into a customer-friendly experience.

### 3.1 POTENTIAL WEBSITE MANAGEMENT ROLES

The production performance reporting website will need to support the solutions identified above, while requiring a minimum of staff time and expertise. The production model accomplishes this through a combination of design, appropriate technology, and curated content.

Building and maintaining a website requires the cooperation of numerous people in several different roles. Typical roles and responsibilities are outlined in Table 3.1. Some of the people filling these roles will be FHWA staff; others may be contractors. In particular, the developer and designer roles may be contracted,

because these roles require specialized technical expertise and have fairly intense resource commitments, but only for a short time at the beginning of the project or if there is a major redesign. Generally, more than one person will be assigned to each role. Some people may function in more than one role.

**Table 3.1 Typical Production Website Roles and Responsibilities**

<b>Role</b>	<b>Responsibilities</b>
Designer	<ul style="list-style-type: none"> <li>• Create information architecture (navigation and categorization schemes)</li> <li>• Provide graphically appealing visual design</li> <li>• Document procedures for authors related to content organization</li> </ul>
Developer	<ul style="list-style-type: none"> <li>• Select software and hardware environment</li> <li>• Implement design using selected software</li> <li>• Ensure that application meets security, accessibility and other requirements</li> </ul>
Author	<ul style="list-style-type: none"> <li>• Create transportation-related stories and reports and other articles</li> <li>• Write and update introductions to performance measures</li> <li>• Select and promote featured stories, data updates and other items of interest</li> </ul>
Graphic Artist	<ul style="list-style-type: none"> <li>• Create infographics in conjunction with domain experts and authors</li> <li>• Create and select images to illustrate stories</li> <li>• Refresh images, especially on the front page, on a regular basis</li> </ul>
Curator	<ul style="list-style-type: none"> <li>• Collect appropriate articles to highlight from the Web and other sources</li> <li>• Prepare selected external content by getting links, PDF copies, and/or permissions from owners to repost</li> <li>• Write headlines, citations, and introductory paragraphs for selected external articles and reports, and add them to the website</li> </ul>
Webmaster	<ul style="list-style-type: none"> <li>• Monitor the site on a day-to-day basis and ensure that it is functioning properly</li> <li>• Make minor updates to the site structure as necessary</li> <li>• Perform backups</li> <li>• Evaluate and disseminate web traffic statistics</li> <li>• Manage dissemination via social networks, email and hard copy</li> <li>• Control which articles get special highlighting and remain on key pages</li> </ul>
Data Specialist	<ul style="list-style-type: none"> <li>• Update performance measures when new data are released</li> <li>• Search for new and better data sources for performance measures</li> <li>• Come up with new ways to present data and make it more useful</li> </ul>
Editor	<ul style="list-style-type: none"> <li>• Work with authors and illustrators to ensure quality</li> <li>• Enforce a consistent voice and style to articles on the site</li> <li>• Create an editorial calendar to keep new content flowing</li> <li>• Make go-no go publishing decisions</li> </ul>

## 3.2 KEYS TO DESIGN AND DEVELOPMENT

Overall site design is established when the system is built, and requires little attention from site maintainers other than to ensure that articles and narratives

are filed in appropriate areas. A good design guides the author and enables her to focus on the content, rather than the aesthetics. The design must accommodate rich content, so that articles can include graphics, video, tables and other elements as needed.

The performance report sample design contains sections for the three narratives that emerged from focus groups, and it features numerous articles with headlines and lead paragraphs and links to the full article. This is similar to the style of many news sites, where blurbs for new articles appear above existing ones and articles eventually migrate off the main page, although they are always available in an archive.

A good design not only guides site visitors efficiently to their areas of interest, but also provides a structure that is easy for writers and editors to understand and use. Writers can tag individual articles with one or more categorical tags, and the system will automatically list each article in the appropriate section. Sometimes articles apply in more than one area, and the ability to assign multiple tags accommodates this. However, a clear structure means that articles naturally fall into one area most of the time. If it is often difficult to determine where an article should live, structural changes may be required.

To separate design from content, most modern websites of this type use a content management system, or CMS. A CMS is a database that stores and delivers both content and design elements. Developers create the framework and design, and authors create the content. There are many good CMS systems available, and many of them are open source. A CMS will generally have a collection of optional modules to implement specific site features, such as a rotating banner, and hooks for developers to create custom-coded extensions. Criteria for selecting a CMS include, among other considerations:

- Availability of modules to implement features you want.
- Proven track record supported by a strong company or active community.
- Ability to find developers familiar with the environment.
- Compatibility with departmental web server environment.

Website development is a project that should be led by an experienced developer, who will have a process in place for gathering requirements, presenting and refining the website design for decisionmakers, implementing the approved design, testing and validating the website at various stages of development, deploying it in a production environment, and providing documentation for authors, webmasters, and network support specialists.



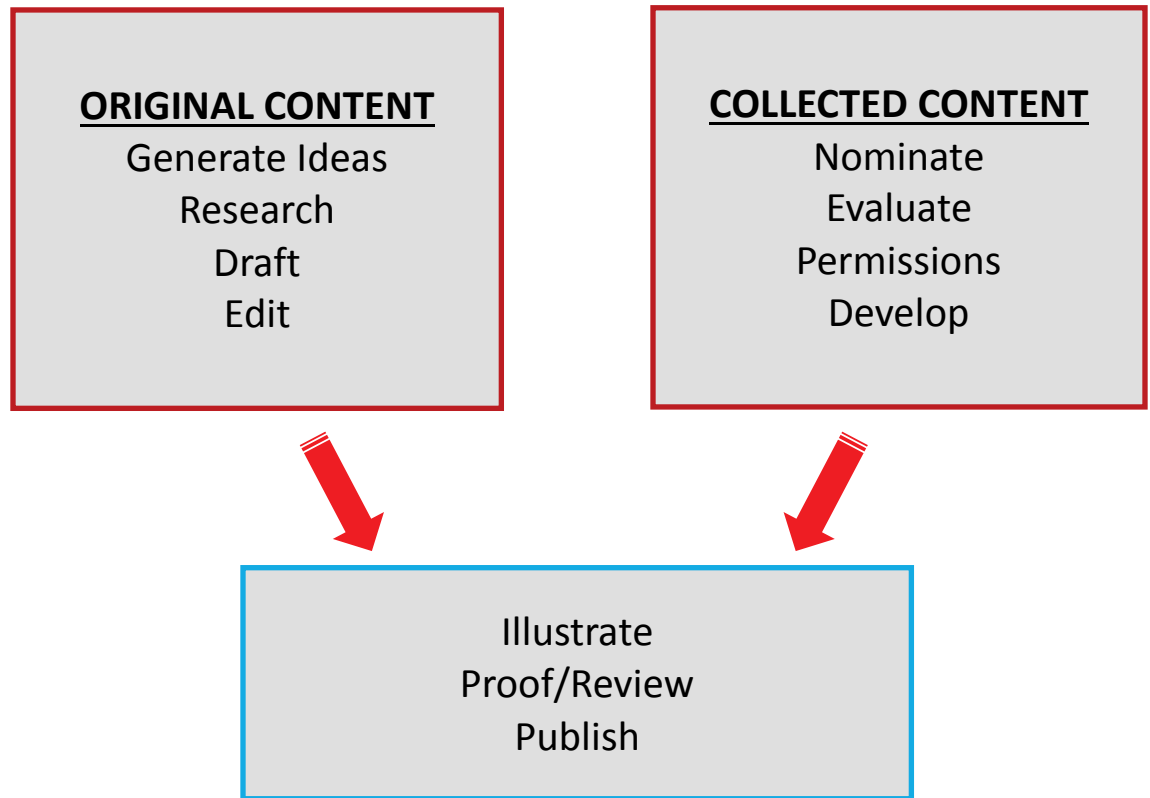
### 3.3 CONTENT CREATION AND MANAGEMENT STRATEGY

Visitors to websites expect the content to be well organized, up-to-date, and interesting or informative. Organization is largely a function of the site design, and authors tag articles when they create them to maintain the organization. A good design will make it easy for authors to assign the correct tags.

Being up-to-date means that fresh content must appear frequently. Older content is still valuable and accessible, but visitors need to see that things are changing and new items appear regularly. At the same time, some content should not be bumped off of a key page, and there should be a mechanism to assure that doesn't happen (a common capability of CMSs). Creating new content can be time-consuming, but much of the content can be reposted from other web sites. This is a valuable service for site visitors, because it means they can find diverse information on one site.

How content originates and the process of getting it to the website depends on the organization, but here are a couple of models – one for original content and the other for collecting existing content. Note that the two processes come together at multiple points. There may be multiple models at work within the organization to produce content, but they should all flow through one person or small group at some point to ensure a consistent feel as visitors navigate through the site.

**Figure 3.1 Content Development Models**



### **Model for Original Content**

Original content includes articles about current topics, in-depth investigations into a particular topic, infographics, tutorials explaining highway-related concepts for non-experts, “how to” videos, and so forth. Although the output and the skills required may differ from article to article, the process is similar.

Content creation begins with an idea for a story. Individual authors may come up with an idea that they would like to pursue, and run with it. More commonly, a small group meets regularly to come up with ideas for the next publication cycle. One advantage of having a group that meets regularly is that they can ensure that new articles are distributed across sections – or narratives, in the lingo of the sample report. The members of the group should be up-to-date on what is happening in the transportation performance area. The same meeting can evaluate external articles nominated for publication (see Model for Collected Content). Ideas that are chosen for further development are assigned to a specific person to shepherd through the next few steps.

The research phase involves finding the material needed for the story. It may require data, quotes from experts, a Web search, or other information gathering. Research and drafting the article tend to be iterative rather than sequential. It is

often helpful to sketch some sort of diagram to help organize the information, which can then be used by a graphic artist to develop an illustration for the story. Articles need not be long. But they do need a good strong lead paragraph or synopsis, since that what will lead many interested site visitors to the full article. And those who may come directly to the article, usually from a search, also benefit from a strong and informative lead.

Most CMSs have a “draft” setting for new articles, so they can be created directly in the target system. A draft article would only be visible to logged-in users with specific roles assigned within the CMS.

Text attributes such as bold, italic, font size, etc. require that there be embedded “markup” codes in the text. This marked-up text is sometimes called “rich text.” Typical word processing programs hide these markup codes and instead display the styled text, in what is known as WYSIWYG (for What You See Is What You Get) editing. Web page markup is called HTML (hypertext markup language), and articles published on a website use HTML to display rich text. In order to have a consistent look across the site, it is important that specific HTML codes be used consistently. Generally, creating content in Word and then pasting it into the CMS results in messy HTML with lots of proprietary Microsoft markup that interferes with website styling. It is important to have a standardized process for inputting text into the CMS to keep the underlying HTML clean.

One solution is to use the CMS editor to input text. CMS editors will generally have a WYSIWYG mode familiar to word processor users. The WYSIWYG editor should allow authors to choose from a list of styles that have been set up by the designer (such as Caption or Paragraph Heading). There will also be an option to show the markup, and those knowledgeable about HTML can toggle back and forth and edit in either mode. Alternatively, some CMS systems support other markup languages, where, for example, “\*\*\*” might signal the beginning and end of a paragraph heading. Whatever system is used, it simplifies site maintenance and consistency if the underlying markup is clean.

Content can still be created in Word or another word processor and pasted into the CMS editor, which usually has a way to strip all the styling from text when it is pasted. The styling is then reapplied using the CMS editor.

The person in the editor role enforces style and voice and may engage in back-and-forth with the author to revise the story. Assigning tags, or labels to categorize the article within the CMS, may be the editor’s responsibility, although authors often suggest tags. Editors also enforce style usage – although the more technical job of checking and cleaning up the HTML is often assigned to the webmaster.

Articles should include graphics to give the site more visual appeal. The editor often coordinates graphic treatment of the site. Generally, there is a small thumbnail that accompanies the lead paragraph in listings on front pages (and when posted to a social network). Within the article there may be diagrams or photographs created specifically to accompany the story, or stock illustrations to

add color and interest. A graphic artist would assist with custom illustrations. The editor, graphic specialist or webmaster may be tasked with selecting stock photos. It is helpful to have a subscription to an online stock photography vendor, since otherwise finding royalty-free photographs and securing permission for their use can be very time-consuming.

The editor generally makes the decision to publish, once content is ready. There may be internal stakeholders who need to approve what goes on the web, or experts who should have that sort of say in their area of expertise, and the editor or webmaster would see that those approvals are obtained. A final proofreading by someone who has not been part of the editing process is a good idea to avert mistakes. The webmaster should have the chance to check the article to make sure the styling and underlying HTML code meets at least minimal standards. Once the article is published, it can be promoted, as discussed in the next section. This is usually a task for the webmaster.

## **Model for Collected Content**

Much of the content on the performance management site will be reposted from external sources. The initial part of this process is different from that for original content. The two processes merge in the final steps before processing.

Finding good content on the web is serendipitous. The more people who are on the lookout for good content the better. There should be an easy way for people to submit links to or descriptions of articles or papers that they think would be good for the site. There might also be an incentive program (as simple as keeping score) and some recognition for frequent contributors.

An editorial planning group would collect these suggestions and decide which ones should be used on the website. An author will need to prepare selected nominations for re-publication. This external material may take several forms:

- A link to a web page on another site.
- A PDF or other format document that could be viewed or downloaded.
- An infographic that may be displayed in a special window on the site.
- An embeddable interactive.

Regardless of the form, the reference to the external content will be wrapped in a brief article that says where it comes from and why it is important, and perhaps provides additional background or instructions. This article is no different from original articles except that the primary purpose is to introduce and give context for external content (which may be from some other FHWA or DOT Web page).

Re-posting content may require the permission of the content creator. At the least, it is a courtesy to inform the originator that it is being considered for reposting, and to work with them to make sure that it is attributed properly. If the connection is a link, it is important to know that the link will be stable – that the content will still be there in a week or month.

At this point, the article is handled as original content: illustrations are added, the editor and webmaster check it for adherence to site standards, and tag it with appropriate categories, and it is published and promoted as described elsewhere in this document.

### **3.4 WEB-BASED DISSEMINATION AND PROMOTION STRATEGIES**

The site should incorporate common social media sharing options for site visitors, including emailing a link, posting to Facebook, Google+ or other such sites, and, especially for content such as infographics and interactive features, embedding in another blog or Web page. People may also want to download graphics to use in their own PowerPoint presentations.

As a website, the performance report will be available 24/7 for anyone who wants to visit it, but it will be more useful if it is “pushed” to interested parties. There are several ways to push content:

- Allow people who sign up to get notices by email when new articles or performance measures are posted.
- Post to a Facebook page and use Twitter to send a notification (tweet) when new articles are published.
- Provide an RSS feed so that people can subscribe to new content.
- Periodically print and distribute paper copies of selected content.

In each case, permitting people to selectively subscribe to these notices by choosing the type of content they find interesting enhances the service. For example, someone might only want to be notified when a new infographic is published, or when performance data are added or updated.

The sign-up procedure would be automated and built into the website, and there is little maintenance associated with maintaining the lists. Posting notices to Facebook and Twitter can be built in to the CMS, so that newly published articles can be automatically posted to these platforms. There should be a person in the loop to monitor comments and traffic on the social networks, respond to feedback or requests, and see that the social media strategy is working as expected.

### **3.5 SUMMARY**

In order to build and maintain an audience, a website needs to be pleasing and easy to use, and be updated frequently with fresh, interesting content. This calls for production capability. Recognizing that FHWA is not likely to have staff dedicated solely to running the website, the production model presented here delineates roles that can be filled alongside people’s other duties. It will be

important to find the right people for key positions, particularly the roles of editor and webmaster. They will need to have several hours available every week to dedicate to these tasks.

Building the site initially requires special expertise, but using a content management system greatly reduces the need for custom coding. Much of the design can be borrowed from the sample site presented with this report. Once the site is up and running there should not be a lot of need for technical development. A webmaster conversant in HTML and social media should be able to handle most needs. The time investment compares favorably with that required to produce a printed report, and it can be spread out rather than being in intense bursts.

## 4.0 Key Steps in Implementation

In order to facilitate the implementation of national performance reports based on the model proposed in Part I of this Report, the study team proposes a staged implementation plan. Following a description of the implementation plan, we assess the priority and urgency levels of the various reporting components, the current program resources, their readiness for use in performance reporting, and the level of effort needed to develop the key performance reporting elements.

Note that the performance reporting approach as laid out in Section 4 of Part I and the staged implementation plan below is aggressive. This approach goes above and beyond the requirements of MAP-21. The approach could be adopted in part or with a diminished level of effort that minimizes some of the elements. However, we believe there is a significant opportunity to go beyond the letter of the law and build on the momentum FHWA has created behind a performance management approach. State DOTs and AASHTO have shown interest in this holistic approach. Audiences have responded well to the non-technical elements of the approach, such as leading with narratives and telling a customer-centric story. We think this ambitious approach will be successful in making performance reporting accessible to a larger audience and a greater part of the transportation conversation in the United States.

The performance reporting approach is dependent on the website not being merely a place for technical performance measures and data, but telling the overall story of transportation. It is anticipated that the site could grow over time to house additional content.

### 4.1 STAGED IMPLEMENTATION PLAN

A staged implementation plan is recommended for the transportation performance report model proposed in Part I of this Report. Table 4.1 summarizes the key steps in each of three phases. These phases are summarized briefly below.

#### **Stage 1. Launching the Initial Site**

The first stage is centered on the launching of a website reporting mechanism with a minimal but sufficient amount of content and website elements necessary to speak to and attract a broad audience. The necessary Stage 1 content includes the website frame and navigation, three narratives with accompanying infographics, a few stand-alone infographics, and a single national technical performance report which covers at minimum one measure for each of the primary performance reporting areas. In order to accomplish this level of development this stage also requires the establishment of the program management framework for the website and developing the content

management work flows to keep material fresh and engaging (see Section 3). The program management framework will require assigning/creating a work unit to oversee the website reporting mechanism and the formation of an oversight committee and the release of a single hardcopy edition of the website content.

During this stage, there is less emphasis on development of a content management system, site outreach, engagement with state partners, a data tool, and internal performance reporting than in later stages. Stage 1 is anticipated to require roughly one year (Year 1).

## **Stage 2. Ramping Up Content and Partnerships**

The second stage follows the launch of the initial site and is focused on increasing the content, developing the content management work flows to keep material fresh and engaging (see Section 3), and adding some of the elements not included in the initial stage (site outreach, engagement with State partners, an interactive data tool, and internal performance add-ons for internal access only). Technical performance reporting capabilities can be expanded in coordination with Program Offices. This might include revised measures or additional measures within a specific content area. If the decision is made to display the state-by-state performance data using the same template as the national technical performance report then that process will be worked out during Stage 2. Consideration could also be given to working with willing State partners to pilot the posting of additional State performance data during this stage.

Feedback on the initial site should be collected and used to make adjustments and improvements during Stage 2. At this point, the need for hardcopy reports can be reviewed. If there is sufficient demand, these could be produced at a minimum annually. The production of topical issue infographics can raise interest and participation in the site. Progress can be made on the interactive data tool (see options in Table 4.1) and, pending the status of rule-making and the internal reception of the site, greater progress can be made towards internal performance reporting. This stage is anticipated to last roughly 2 years (Years 2 and 3).

## **Stage 3. Reaching a Sustainable Level of Success**

The third stage brings the performance report to full operating capacity. During this stage the full vision for a web-based performance report will be realized. During Stage 3, a decision can be made as to whether local (regional, and/or metro) performance information is available and if so, if it is desirable to add it to the performance section of the website. Stage 3 should include broad promotion of the site and its contents, full engagement with State partners to expand State-level content, and active responses to customer feedback and demand resulting in improved and expanded content on the site. At this point website content should be robust and the management of the site and the content development process should be fully developed and sustainable. The technical performance reporting can be expanded significantly in partnership with Program Offices,



State partners, and customers. In this stage data will be updated as frequently as possible based on available resources and the site will begin to demonstrate value by identifying data gaps and weaknesses. Growth and development of the data tool will coincide with addressing data gaps. State by State comparisons should be an easily accessible function. Expanding the internal performance reporting capabilities should be a major goal at this point. This stage is anticipated to begin in Year 4 and continue indefinitely.

The recommended work on each performance reporting element broken out by implementation stage is included below in Table 4.1.

**Table 4.1 Elements for Staged Implementation**

Elements	STAGE 1 (Year 1)	STAGE 2 (Years 2 & 3)	STAGE 3 (Years 4+)
Program Management	<ul style="list-style-type: none"> <li>• Assign roles and responsibilities.</li> <li>• Engage partners for support.</li> <li>• Establish oversight group to provide approval for initial report.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop ongoing roles, responsibilities, and partnerships as needs evolve.</li> <li>• Involve oversight group around major updates and decision points.</li> </ul>	<ul style="list-style-type: none"> <li>• Involve oversight group around major updates and decision points.</li> </ul>
Outreach	<ul style="list-style-type: none"> <li>• Plan for and conduct roll-out to get as much awareness as possible among target audiences with release of Stage 1 site content.</li> </ul>	<ul style="list-style-type: none"> <li>• Publicize among key stakeholder groups.</li> <li>• Continue outreach to attract target audiences.</li> </ul>	<ul style="list-style-type: none"> <li>• Continue outreach to attract target audiences.</li> </ul>
Website Frame, Navigation, and Graphics	<ul style="list-style-type: none"> <li>• Develop and launch site with all Stage 1 content.</li> <li>• Include feedback mechanism.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain.</li> <li>• Collect feedback regularly and monitor site performance.</li> <li>• Make incremental improvements and additions.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain.</li> <li>• Review need for major format revision based on feedback, implement if needed.</li> </ul>
Hard Copy Reports	<ul style="list-style-type: none"> <li>• Release initial site and Stage 1 content as hard copy report to accompany launch.</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor interest in hard copy reporting to influence frequency and level of effort in this direction.</li> <li>• Release annual hard copy reports at minimum, consider greater frequency and/or need for hard copy reports.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop hard copy reports schedule based on demand and frequency of data update, potentially on quarterly basis.</li> <li>• Archive all hard copies.</li> <li>• Promote archived hard copies as performance tracking resource.</li> </ul>
Narratives	<ul style="list-style-type: none"> <li>• Develop the 3 narratives pages with intro text and engaging infographics</li> </ul>	<ul style="list-style-type: none"> <li>• Make revisions to initial 3 narratives based on feedback.</li> <li>• Supplement narratives with additional infographics (target 3 per narrative).</li> <li>• Develop additional 3 narratives to rotate.</li> </ul>	<ul style="list-style-type: none"> <li>• Continue expansion of narratives and supporting infographics.</li> <li>• Collect feedback on effectiveness of various narratives and supporting material.</li> <li>• Optimize narrative rotation to most effectively reach audiences.</li> </ul>

Elements	STAGE 1 (Year 1)	STAGE 2 (Years 2 & 3)	STAGE 3 (Years 4+)
Narrative-Supporting Content <i>(for "In the Spotlight" and links on Narrative pages)</i>	<ul style="list-style-type: none"> <li>Collect and publish initial narrative-supporting content (target minimum 3 per narrative).</li> <li>Develop and implement regular supporting content management system (see Section 3).</li> </ul>	<ul style="list-style-type: none"> <li>Update on quarterly basis at minimum.</li> </ul>	<ul style="list-style-type: none"> <li>Update and revise as needed but with sufficient frequency to keep site fresh and engaging.</li> </ul>
Sharable Infographics <i>(for "In the Spotlight" and as standalone pages)</i>	<ul style="list-style-type: none"> <li>Repackage Bicycle Safety Infographic and develop 2 to 3 more to establish infographics branding, publish.</li> <li>Collect and publish 5-6 additional topical infographics (from external sources) .</li> </ul>	<ul style="list-style-type: none"> <li>Follow supporting content management system (see above).</li> <li>Produce internal infographics following branding guidelines (target 1 monthly).</li> <li>Regularly identify and publish infographics from external sources (target 3-4 monthly).</li> </ul>	<ul style="list-style-type: none"> <li>Continue production of internal infographics following branding guidelines (target 1/month).</li> <li>Regularly identify and publish infographics from external sources (target 3-4/month).</li> </ul>
Factoids <i>(for "Boring But Important" Home Page Section)</i>	<ul style="list-style-type: none"> <li>Develop single "Boring But Important" fact list, either relying on existing example provided in sample or using new idea.</li> </ul>	<ul style="list-style-type: none"> <li>Produce "Boring But Important" updates (target quarterly at minimum).</li> </ul>	<ul style="list-style-type: none"> <li>Produce "Boring But Important" updates (target monthly).</li> <li>Optimize rotation to most effectively reach audiences.</li> </ul>

Elements	STAGE 1 (Year 1)	STAGE 2 (Years 2 & 3)	STAGE 3 (Years 4+)
Performance Measures	<ul style="list-style-type: none"> <li>Define beta performance measures in consultation with Program Offices (target 1 measure for each principal areas) Develop snapshot, trend, narratives, facts, and assumptions for each measure on national level to create technical performance report</li> <li>Send technical performance report in electronic and hard copy to broad audience</li> </ul>	<ul style="list-style-type: none"> <li>Redefine performance measures as needed and as performance management evolves.</li> <li>Refine and comprehensively update technical performance report at national level as new performance data becomes available, no less than annually. Increase data update frequency to reflect real data availability (quarterly or biannually).</li> <li>Rotate highlighted measure focusing on new data or topic which is timely.</li> <li>Increase number of performance measures in consultation with Program Offices (target 2-3 measures for each principal area).</li> <li>Reach out to State partners to develop 3-4 state level pilot performance reports using a similar template.</li> <li>Continue outreach and promotion of technical performance report.</li> <li>Collect feedback regularly and monitor report reception.</li> </ul>	<ul style="list-style-type: none"> <li>Report on a robust set of performance measures.</li> <li>Review need for format revisions based on feedback, implement if needed.</li> <li>Update technical reports and highlighted measures based on available data.</li> <li>Increase number of performance measures in consultation with Program Offices to include as many reliable measures for each of the principle areas as possible/viable.</li> <li>Review reports to identify ongoing data issues and gaps.</li> <li>Explore greater State level adoption of performance reports template (options include State-provided reports or FHWA-compiled reports based on state-provided data).</li> <li>Focus on enhancing State by State comparison capabilities while maintaining sensitivity and context.</li> <li>Continue outreach and promotion of technical performance report.</li> </ul>
Interactive Data Tool	<ul style="list-style-type: none"> <li>If data tool (such as HIPAT) is ready and available for external users, include as link in website, promote.</li> </ul>	<ul style="list-style-type: none"> <li><b>OPTION 1:</b> If data tool (such as HIPAT) is up and running, maintain link and pursue options to expand HIPAT capabilities in the area of performance reporting.</li> <li><b>OPTION 2:</b> Provide links to external data tools (potentially multiple ones) that provide users with performance data review capabilities.</li> <li><b>OPTION 3:</b> If no data tool has been developed, build GIS-based data tool using technical performance report as guideline, link to site.</li> </ul>	<ul style="list-style-type: none"> <li>Regularly update data tool resources.</li> <li>Focus on enhancing state by State comparison capabilities while maintaining sensitivity and context.</li> <li>Review data tool to identify ongoing data issues and gaps.</li> <li>Review need for revisions based on feedback, implement if needed.</li> </ul>

Elements	STAGE 1 (Year 1)	STAGE 2 (Years 2 & 3)	STAGE 3 (Years 4+)
Internal Reports	<ul style="list-style-type: none"> <li>• Monitor results of ongoing internal performance reporting projects.</li> <li>• Internally promote performance reporting site as potential vehicle for expanded internal performance reporting.</li> </ul>	<ul style="list-style-type: none"> <li>• Work with Program Offices and District Administrators to more clearly define internal reporting needs and opportunities.</li> <li>• Define <b>CONTEXT</b> needs: What information is needed to better understand each state's unique situation related to performance?</li> <li>• Define <b>ACTIONS</b> needs: What information is needed to better understand the actions taken by each state to improve performance?</li> </ul>	<ul style="list-style-type: none"> <li>• Add internal performance reporting element to technical performance reports (for internal access only).</li> <li>• Regularly update data.</li> <li>• Collect feedback and monitor report reception.</li> </ul>



## 4.2 SUMMARY OF PROGRAM EFFECTIVENESS AND READINESS

To further support the implementation plan, the study team assessed the priority and urgency levels of the various reporting components, the current program resources, their readiness for use in performance reporting, and the level of effort needed to develop the key performance reporting elements. These findings are summarized in Table 4.2.

The purpose of each individual element--which collectively make up a comprehensive performance reporting tool—is described in Table 4.2. Purposes are linked to the audience research conducted and each is focused on satisfying customers.

Descriptions of Priority and Urgency are based on the current FHWA framework for assessing these elements (taken from project kickoff meeting) as follows:

- **Priority** - How important is this to the success of national transportation performance.
  - **High** - Essential to there being national transportation performance.
  - **Medium** - Necessary to serve as national leaders.
  - **Low** - Will allow FHWA to be more effective.
- **Urgency** - How soon will this need have to be met?
  - **Immediate** - Will need to be met upon enactment of authorization.
  - **Short Term** - Will need to be met within 18 months of enactment.
  - **Long Term** - Won't need to be met until beyond 18 months of enactment.

The majority of the items fall under the Medium level of priority as providing a useful and engaging performance reporting tool will be necessary for FHWA to serve as a national leader. The individual performance measures themselves are rated High as they are essential to transportation performance regardless of how they are delivered.

All of the external reporting elements are considered Short Term. The internal reporting elements are considered Long Term.

Additional columns explore the current resources available and the current readiness of FHWA to produce the element (based on a **Low**, **Medium**, or **High** classification). FHWA generally has a level of readiness ranging from Medium to High for most of the website elements and performance measures. FHWA's current readiness for the website development is labeled Medium as this will

require new responsibilities to be assigned and undertaken and partnerships to be initiated and no work has yet begun. The site is not labeled as Low because this study does provide a framework and implementation strategy. There is a Low level of readiness for the internal reporting task, given the ongoing studies in that area and the necessary coordination that still needs to take place.

The final column covers the level of effort to complete the element, again relying on a **Low**, **Medium**, or **High** classification. High levels of effort are required for the website frame and navigation, the interactive data tool, and internal performance reporting. Some of the specific performance measures will require a Medium level of effort, but most fall into the Low category. Other Low effort items include much of the supporting content for the website, which will require frequent updates but should be relatively easy to collect and package from existing sources.



Table 4.2 Report Elements Overview and FHWA Readiness

Element	Purpose (How does this meet customer needs?)	Importance	Urgency	Current Resources and Readiness (Source Material? Capacity to Produce? Ongoing Initiatives? Related Roles?)	Level of Effort to Complete (Timeframe/Updates?)
<b>Website Frame, Navigation, and Graphics</b>	<ul style="list-style-type: none"> <li>Design is tailored to attract key audience groups.</li> <li>Design determines how easy it is to navigate site and how appealing the site is.</li> </ul>	Medium	Short Term	<ul style="list-style-type: none"> <li>Draw on framework established as part of this project.</li> <li>May need external support for site development.</li> <li>FHWA's current readiness is <b>Medium</b> as this will require new responsibilities to be assigned and undertaken and partnerships to be initiated and no work has yet been initiated (this is not labeled as <b>Low</b> because this study does provide a framework and implementation strategy).</li> </ul>	<ul style="list-style-type: none"> <li>This requires a <b>High</b> level effort.</li> <li>Major tasks include site development and development of a content management system.</li> <li>Once developed, this site should last for a significant period of time though content should be regularly updated.</li> </ul>
<b>Narrative #1 – Our Transportation Investment</b>	<ul style="list-style-type: none"> <li>Audiences want transparency and accountability.</li> <li>Audiences want to know how their money is spent and what is accomplished with the spending.</li> <li>Provides audience with understanding of the role of transportation organizations and how decisions are made, funded, etc.</li> </ul>	Medium	Short Term	<ul style="list-style-type: none"> <li>Draw on text and graphics established as part of this project.</li> <li>Can draw from existing reports such as the Conditions &amp; Performance Report. FHWA is fully capable of developing original material in this subject area.</li> <li>FHWA's current readiness is <b>Medium</b> as current resources exist.</li> <li>Finance, Safety, Operations, Freight Operations, Bridge Technology, Asset Management &amp; Pavement Technology Office all have a related role as the issues are "where does the money come from, go to, and what do we get for it."</li> </ul>	<ul style="list-style-type: none"> <li>This requires a <b>Low</b> level effort.</li> <li>Once developed, the narrative should last for at least a year and potentially longer, though the data should be revisited annually.</li> </ul>

Element	Purpose (How does this meet customer needs?)	Importance	Urgency	Current Resources and Readiness (Source Material? Capacity to Produce? Ongoing Initiatives? Related Roles?)	Level of Effort to Complete (Timeframe/Updates?)
<b>Narrative #2 – Our Economic Wellbeing</b>	<ul style="list-style-type: none"> <li>Helps establish the link between transportation investment and economic wellbeing.</li> <li>Audiences indicate that economic benefits of transportation is one of two issues they care about most.</li> </ul>	Medium	Short Term	<ul style="list-style-type: none"> <li>Can draw from existing reports such as the Freight Facts and Figures report or AASHTO's Unlocking Freight report.</li> <li>FHWA's current readiness is <b>Medium</b>.</li> <li>Office of Policy has a related role and will be a source of information.</li> </ul>	<ul style="list-style-type: none"> <li>This requires a <b>Low</b> level effort.</li> <li>Once developed, the narrative should last for at least a year and potentially longer, though the data should be revisited annually.</li> </ul>
<b>Narrative #3 – Our Mobile Lifestyle</b>	<ul style="list-style-type: none"> <li>Audiences want to know how transportation impacts their lives.</li> <li>Audiences are interested in how transportation impacts their communities.</li> <li>Safety issues can be discussed here and safety is of high interest to audiences.</li> </ul>	Medium	Short Term	<ul style="list-style-type: none"> <li>Can draw from existing reports such as those developed under the USDOT focus on Livability.</li> <li>FHWA's current readiness is <b>Medium</b>.</li> <li>Safety, Planning Environment and Realty have related roles and will be a source of information.</li> </ul>	<ul style="list-style-type: none"> <li>This requires a <b>Low</b> level effort.</li> <li>Once developed, the narrative should last for at least a year and potentially longer, though the data should be revisited annually.</li> </ul>
<b>Narrative-Supporting Content</b>	<ul style="list-style-type: none"> <li>Provides additional content to advance narratives.</li> <li>Draws additional viewers to the site.</li> <li>Adds interest to the site.</li> <li>Keeps site fresh.</li> </ul>	Medium	Short Term	<ul style="list-style-type: none"> <li>Significant amount of ready material from FHWA, AASHTO, NCHRP, TRB, research partners, academics, State DOTs.</li> <li>FHWA's current readiness is <b>High</b>.</li> <li>Office of Public Affairs, Infrastructure, Office of Research, Development, and Technology, Freight Operations, Safety, Planning, Environment and Realty, Policy and Public Affairs, Innovative Program Delivery all have related roles and will be a source of content.</li> </ul>	<ul style="list-style-type: none"> <li>This requires a <b>Low</b> level effort.</li> <li>Much of the initial content will be collected rather than original, over time the creation of tailored original material may pick up.</li> <li>Content will require regular refreshing at weekly intervals.</li> </ul>

Element	Purpose (How does this meet customer needs?)	Importance	Urgency	Current Resources and Readiness (Source Material? Capacity to Produce? Ongoing Initiatives? Related Roles?)	Level of Effort to Complete (Timeframe/Updates?)
<b>Sharable Infographics</b>	<ul style="list-style-type: none"> <li>Engages the audience.</li> <li>Draws additional viewers to the site.</li> </ul>	Medium	Short Term	<ul style="list-style-type: none"> <li>Draw on infographics developed as part of this project for inspiration.</li> <li>Significant amount of ready material.</li> <li>FHWA's current readiness is <b>High</b>.</li> <li>Office of Public Affairs, Infrastructure, Office of Research, Development, and Technology, Freight Operations, Safety, Planning, Environment and Realty, Policy and Public Affairs, Innovative Program Delivery all have related roles and will be a source of content.</li> </ul>	<ul style="list-style-type: none"> <li>This requires a <b>Low</b> level effort.</li> <li>Much of the initial content will be collected rather than original, over time the creation of tailored original material may pick up.</li> <li>Content will require regular refreshing at weekly intervals.</li> </ul>
<b>Interactive Data Tool</b>	<ul style="list-style-type: none"> <li>Provides viewers with the opportunity to review and drill down into data, combine data items to identify relationships, generate stories, and verify own conclusions.</li> </ul>	Medium	Short Term	<ul style="list-style-type: none"> <li>Use HIPAT tool if possible.</li> <li>Study underway to create data visualization tool.</li> <li>FHWA's current readiness is <b>Medium</b>.</li> <li>Office of Infrastructure and Planning Environment &amp; Realty have related roles.</li> </ul>	<ul style="list-style-type: none"> <li>Level of effort depends on how much original development work is required for a tool, but generally should be considered <b>High</b>.</li> <li>Developing and managing state-by-state comparisons in a reliable and sensitive manner will be difficult.</li> <li>Tool will require regular data updates, at minimum annually.</li> </ul>

Element	Purpose <i>(How does this meet customer needs?)</i>	Importance	Urgency	Current Resources and Readiness <i>(Source Material? Capacity to Produce? Ongoing Initiatives? Related Roles?)</i>	Level of Effort to Complete <i>(Timeframe/Updates?)</i>
<p><b>Performance Measures</b></p> <p><i>(Note: This element covers performance measures as a whole; the specific measure areas of Safety, Pavement Condition, Bridge Condition, Congestion, Reliability, Freight, Environment, and Project Delivery are discussed individually below).</i></p>	<ul style="list-style-type: none"> <li>Initial performance measures (to be updated following rule-making) provide viewers with the necessary means to gauge performance on a meaningful level.</li> <li>All measures will require context and explanation to be valuable to audiences.</li> <li>The seven initial areas for performance reporting defined in MAP-21 are listed below as a starting point.</li> </ul>	High	Short Term	<ul style="list-style-type: none"> <li>MAP-21 provides initial guidance on potential initial performance measures (as does the work of AASHTO's SCOPM).</li> <li>Many sources of original data collected from state DOTs such as NBI and HPMS and third-party data such as travel times collected via probe.</li> <li>Several resources for post-processed performance measures will support measure development, namely the Leadership Team Dashboard, the Conditions &amp; Performance Report, the Milepost Report, the Strategic Implementation Plan End-of-Year Status Scorecard, and the DFS Dashboard.</li> <li>Rule-making outcomes will provide guidance for the ultimate performance measures.</li> <li>FHWA's current readiness is <b>Medium</b>.</li> <li>Office of Infrastructure through the Performance Management Office has a related and a coordinating role with all other FHWA Offices.</li> </ul>	<ul style="list-style-type: none"> <li>Assembling the initial performance measures will require a <b>Low</b> level of effort.</li> <li>Updating measures following rule-making will require a <b>Medium</b> level of effort as a very collaborative process will be needed.</li> <li>Performance measures should be updated as frequently as possible, frequency is likely to vary by measure from quarterly to annual updates.</li> <li>Note that Transit is not directly included in the seven initial areas for performance reporting defined in MAP-21, this may be an area for additional development given the public's interest in the topic.</li> </ul>

Element	Purpose (How does this meet customer needs?)	Importance	Urgency	Current Resources and Readiness (Source Material? Capacity to Produce? Ongoing Initiatives? Related Roles?)	Level of Effort to Complete (Timeframe/Updates?)
Safety	<ul style="list-style-type: none"> <li>Safety is one of the greatest areas of interest for the general public and legislators</li> </ul>	High	Short Term	<ul style="list-style-type: none"> <li>Leadership Team Dashboard includes measure of highway fatality rate results and target (annual)</li> <li>Conditions &amp; Performance Report includes highway fatality rates and highway injury rates.</li> <li>Additional safety measures are included in the Milepost Report.</li> <li>Safety data (fatalities and exposure) has been around for many years, well recognized, have great data coverage, get fatalities from FARS (great data provider though there is a data lag), draw exposure from HPMS to get VMT and get fatality rates.</li> <li>Serious injury is not reported nationally, NHTSA does annual estimate on serious injury crashes, much broader dataset but problems with definition consistency among States.</li> <li>Some NCHRP projects (17-57, 20-24(37)K) are addressing the issue of data reporting on serious injuries, ongoing survey of how States are collecting serious injury data and any medical linkages.</li> <li>FHWA's current readiness is <b>High</b>.</li> <li>The Office of Safety and the Office for Transportation Performance Management have related roles.</li> </ul>	<ul style="list-style-type: none"> <li>Assembling the initial performance measures will require a <b>Low</b> level of effort.</li> <li>Annual update is fine, however, would be good to improve the latency lag .</li> </ul>

Element	Purpose <i>(How does this meet customer needs?)</i>	Importance	Urgency	Current Resources and Readiness <i>(Source Material? Capacity to Produce? Ongoing Initiatives? Related Roles?)</i>	Level of Effort to Complete <i>(Timeframe/Updates?)</i>
Pavement Condition	<ul style="list-style-type: none"> <li>Customers notice rough pavement conditions but generally believe this is the minimum they should expect from the system.</li> </ul>	High	Short Term	<ul style="list-style-type: none"> <li>Leadership Team Dashboard includes measure of percent VMT on NHS with good to very good ride quality including target (quarterly).</li> <li>Conditions &amp; Performance Report includes IRI measure.</li> <li>Additional measures related to material quality are included in Milepost Report.</li> <li>DFS Dashboard includes measure of percent travel on NHS with good ride quality.</li> <li>Recent I-90 pilot corridor study showed that in that case HPMS IRI was pretty consistent, rutting was okay, faulting has some issues but can be addressed, cracking had significant issues.</li> <li>Several ongoing initiatives to improve pavement data including the Transportation Asset Management Plan Pilot Project, Pavement Data Collection Guide, Pavement Management Roadmap Marketing Plan, Pavement Health Track Tool, and ongoing discussions with Transportation Asset Management Expert Task Group.</li> <li>FHWA's current readiness is <b>Medium</b>.</li> <li>Office of Asset Management, Pavement, and Construction and the Office for Transportation Performance Management have related roles.</li> </ul>	<ul style="list-style-type: none"> <li>Assembling the initial performance measures will require a <b>Low</b> level of effort.</li> <li>With pavement item, annual updates are generally sufficient.</li> </ul>

Element	Purpose (How does this meet customer needs?)	Importance	Urgency	Current Resources and Readiness (Source Material? Capacity to Produce? Ongoing Initiatives? Related Roles?)	Level of Effort to Complete (Timeframe/Updates?)
Bridge Condition	<ul style="list-style-type: none"> <li>The public has demonstrated concern over the safety of bridges.</li> </ul>	High	Short Term	<ul style="list-style-type: none"> <li>Leadership Team Dashboard includes measure of percent of deck area on deficient bridges with target (annual).</li> <li>Conditions &amp; Performance Report includes percent of deficient bridges and replacement values.</li> <li>National Bridge Inspection Standards (NBIS) and the National Bridge Inventory (NBI) data resources are very mature.</li> <li>Corridor Infrastructure Health Study provides framework for combining condition ratings into single measure (Good/Fair/Poor).</li> <li>2014-2015 will start collecting element level data for NHS.</li> <li>FHWA's current readiness is <b>High</b>.</li> <li>Office of Bridge Technology and the Office for Transportation Performance Management have related roles.</li> </ul>	<ul style="list-style-type: none"> <li>Assembling the initial performance measures will require a <b>Low</b> level of effort.</li> <li>Annual updates are likely to be sufficient.</li> </ul>

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Congestion	<ul style="list-style-type: none"> <li>Congestion is an area of high customer interest.</li> </ul>	High	Short Term	<ul style="list-style-type: none"> <li>Leadership Team Dashboard includes measure of travel time index with target (annual).</li> <li>Conditions &amp; Performance Report includes travel time index broken out by urbanized area size.</li> <li>Milepost Report includes hours of congested travel among other measures.</li> <li>From the standpoint of Office of Operations, for internal reports, use Urban Congestion Report (for past 5 years), using data from TMC, various archives, ITIP (Navteq, Traffic.com, etc), currently only get data in 19 urban areas.</li> <li>Office of Operations reports Travel Time Index, Planning Time Index, temporal congestion.</li> <li>Office of Operations has plans for data expansion to improve coverage and accuracy.</li> <li>FHWA's current readiness is <b>Medium</b>.</li> <li>Office of Policy, Office of Planning Environment and Realty, Office of Transportation Performance Management, Office of Freight, and Office of Operations have related roles.</li> </ul>	<ul style="list-style-type: none"> <li>Assembling the initial performance measures will require a <b>Medium</b> level of effort.</li> <li>Quarterly updates would be preferred.</li> </ul>



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Reliability	<ul style="list-style-type: none"> <li>Reliability is less well understood by the general public but significantly impacts travel patterns.</li> </ul>	High	Short Term	<ul style="list-style-type: none"> <li>Leadership Team Dashboard includes measure of reliability in key freight corridors with target (quarterly).</li> <li>This measure could be expanded upon with better data resources.</li> <li>Both Offices of Operations and Freight have plans for data expansion to improve corridor-based coverage and accuracy.</li> <li>This measure is one of the more difficult ones to communicate to an audience.</li> <li>FHWA's current readiness is <b>Low</b>.</li> <li>Office of Operations, Freight and Transportation Performance Management have related roles.</li> </ul>	<ul style="list-style-type: none"> <li>Assembling the initial performance measures will require a <b>Medium</b> level of effort.</li> <li>Strengthening the ability to communicate reliability may require additional effort though some projects are underway that may support this.</li> <li>Quarterly updates would be preferred.</li> </ul>
Freight	<ul style="list-style-type: none"> <li>Freight, especially as it ties into economic growth, is an interest area.</li> </ul>	High	Short Term	<ul style="list-style-type: none"> <li>Leadership Team Dashboard includes measure of reliability in key freight corridors with target (see Reliability) and a Freight Efficiency Index based on performance at bottlenecks, urban congestion, border crossings, and top intermodal connectors.</li> <li>Office of Freight has very data mature resources related to truck movements.</li> <li>Additional work may be required to communicate the link between the freight movements and economic vitality.</li> <li>FHWA's current readiness is <b>Low</b>.</li> <li>Offices of Freight and Transportation Performance Management have related roles.</li> </ul>	<ul style="list-style-type: none"> <li>Assembling the initial performance measures will require a <b>Medium</b> level of effort.</li> <li>Strengthening the economic components of freight measures may require additional effort.</li> <li>Quarterly data updates preferred, preferably with links to economic performance data.</li> </ul>

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Environment	<ul style="list-style-type: none"> <li>The public is interested in sustainable investment and good environmental stewardship but there is little understanding as to what should be measured.</li> </ul>	High	Short Term	<ul style="list-style-type: none"> <li>No direct Leadership Team Dashboard measures though there are measures of States with policies that improve non-motorized transportation, States with climate change action or adaption plans, and median time to process an EIS.</li> <li>Office of Policy collects gallons of motor fuel and diesel consumption to use as an indicator of where we are headed and support revenue and emissions projections.</li> <li>A carbon calculator tool was developed with pilot tests underway (see End-of-Year Status Scorecard).</li> <li>Additional work may be required to strengthen environmental measures.</li> <li>Livability performance measures are likely to develop significantly in the next couple years (measures of access to transportation for special needs populations and access to affordable choices included in President's FY 2012 Budget).</li> <li>FHWA's current readiness is <b>Low</b>.</li> <li>Offices of Planning Environment &amp; Realty and Transportation Performance Management have related roles.</li> </ul>	<ul style="list-style-type: none"> <li>Assembling the initial performance measures will require a <b>Medium</b> level of effort.</li> <li>Strengthening the environmental measures may require additional effort.</li> <li>Timeframe for updates is uncertain and could range from quarterly to annual.</li> </ul>

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Project Delivery	<ul style="list-style-type: none"> <li>The public demands accountability and transparency</li> </ul>	High	Short Term	<ul style="list-style-type: none"> <li>Leadership Team Dashboard includes measures of percent of Recovery Act Funds expended and median time to process an EIS.</li> <li>The Milepost Report includes an objective of innovative project delivery based on a survey of Division Offices among several other measures under the National Leadership and Program Delivery strategic goals.</li> <li>DFS dashboard details projects as well as some State-level indicators.</li> <li>FHWA uses the Fiscal Management Information System (FMIS) to house project-level data on construction, maintenance, and research (includes authorization dates, close-out dates, expenditure dates, some raw project data), new version may include geospatial elements.</li> <li>Additional work may be required to communicate project delivery effectively to the non-transportation audience.</li> <li>FHWA's current readiness is <b>Medium</b>.</li> <li>Several FHWA Offices and teams are focused in improving this area and have related toles for project delivery including Innovative Program Delivery, DFS, Federal Lands, the Program Management Improvement Team, and the Office of Chief Financial Officer.</li> </ul>	<ul style="list-style-type: none"> <li>Assembling the initial performance measures will require a <b>Medium</b> level of effort.</li> <li>Strengthening the project delivery measures and communicating them clearly to the public may require additional effort.</li> <li>Effectively incorporating and communicating measures of risk should be a long-range goal.</li> <li>Timeframe for updates is uncertain but most likely quarterly.</li> </ul>

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<p><b>Internal Reporting Enhancements</b> <i>(Note: This element covers internal reporting enhancements as a whole; two specific potential enhancements are discussed individually below)</i></p>	<ul style="list-style-type: none"> <li>FHWA can benefit from detailed internal performance reporting to enhance discussions with state partners and focus attention on outcomes that improve performance.</li> <li>Two key areas for internal reporting content are discussed below.</li> </ul>	Low	Long Term	<ul style="list-style-type: none"> <li>Draw on work completed as part of Corridor Health Assessment Project.</li> <li>Study underway to create data visualization tool which may enhance internal reporting.</li> <li>Will require significant internal coordination.</li> <li>FHWA's current readiness is <b>Low</b>.</li> <li>Every Office at FHWA has a related role for internal reporting enhancements.</li> </ul>	<ul style="list-style-type: none"> <li>This requires a <b>High</b> level effort, unless the results of ongoing work produce outcomes that satisfy the needs of this project.</li> <li>Internal performance reporting is likely to focus on an annual cycle.</li> </ul>
<p>Additional Context Data</p>	<ul style="list-style-type: none"> <li>Sophisticated context is required to understand the reasoning behind historic, current, and future system performance and the motivations behind investments in performance unique to each State.</li> </ul>	Low	Long Term	<ul style="list-style-type: none"> <li>Framework established as part of this project for technical performance report provides some direction for content reporting.</li> <li>As performance reporting matures in application, regular feedback on needed context must be collected.</li> <li>FHWA's current readiness is <b>Low</b>.</li> <li>Every Office at FHWA has a related role for additional context data.</li> </ul>	<ul style="list-style-type: none"> <li>This requires a <b>High</b> level effort.</li> <li>Internal performance reporting is likely to focus on an annual cycle.</li> </ul>

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Action Indicators (such as Countermeasure Adoption Rates)	<ul style="list-style-type: none"> <li>A comprehensive understanding of the actions undertaken to improve performance will fuel discussion over future actions.</li> </ul>	Low	Long Term	<ul style="list-style-type: none"> <li>Offices of Safety and Operations have good models in place for countermeasure adoption rates.</li> <li>Leadership Team Dashboard includes measure of safety countermeasures baseline assessment (quarterly).</li> <li>Leadership Team Dashboard includes planned measure of state participation in HPMS pavement data review.</li> <li>Leadership Team Dashboard includes Operations Efficiency Index.</li> <li>Other Offices may have greater challenges developing countermeasures specific to a single performance measure.</li> <li>Officially recommended countermeasures will require broad consensus to be effective and are likely to be controversial.</li> <li>In many cases countermeasures will need to be tailored to the specific situation of States, adding to their complexity.</li> <li>FHWA's current readiness is <b>Low</b>.</li> </ul>	<ul style="list-style-type: none"> <li>This requires a <b>High</b> level effort.</li> <li>Internal performance reporting is likely to focus on an annual cycle but include regular updates during the year, potentially as frequently as monthly.</li> </ul>



