April 29, 2015

Gregory G. Nadeau
Deputy Administrator, Federal Highway Administration
U.S. Department of Transportation
1200 New Jersey Avenue, S.E
Washington, DC 20590

Re: Docket No. FHWA-2013-0053-0073

The Tri-State partners - Maine Department of Transportation, New Hampshire Department of Transportation, and Vermont Agency of Transportation - are pleased to jointly provide comments on the Federal Highway Administration's (FHWA) "National Performance Management Measures; Assessing Pavement Condition for the National Highway Performance Program and Bridge Condition for the National Highway Performance Program"; Proposed Rule (Docket Number FHWA-2013-0053-0073) published in the Federal Register on January 2, 2015.

Background on the Tri-State Partnership Performance Measures

Performance management, the development of performance measures, and establishing performance targets are not new to the Tri-State partners. For the last decade, all three State DOTs developed and implemented performance management systems to help them make effective investment decisions within resource limitations. An important aspect of this effort has been examining performance measures for a wide variety of highway and bridge areas, with the implementation and support of the Managing Assets for Transportation System initiative.

Tri-State partners recognized that performance standards were being examined nationally since the early 2000s. It was understood that standard performance measures would benefit Tri-State partners by assisting in communications with each state's respective stakeholders and customers. For these reasons, Tri-State partners signed a Memorandum of Understanding in 2010 to work collectively in developing standard performance measures relating to asset conditions and business processes, and safety.

The Tri-State partnership work to date has focused on utilizing standard measures to monitor performance. The close and collaborative monitoring of these measures has identified areas for improvement which have been spotlighted nationally. These efforts have the three State DOTs well positioned to meet the proposed performance targets included in the proposed rulemaking. In addition, future collaboration along the asset management spectrum is anticipated as each state begins its process to implement the final rulemaking.

Response to the Proposed Rule

The Tri-State partners are generally supportive of the bridge and paving performance provisions included in the proposed rulemaking, and believe that the performance management principles can be implemented along related rulemakings in a manner that advances a safer and more efficient transportation system. However, there are several areas in which we have concerns and encourage FHWA to take action addressing those concerns in final rulemaking. Please refer to Attachment 1, which includes additional detail on the points included below:

1. **Flexibility in Target Setting**

Authority for target setting in Moving Ahead for Progress in the 21st Century (MAP-21) clearly lies with the States, as each State is required to set performance targets that use the performance measures developed by US Department of Transportation (US DOT). Target setting needs to take into account that States face different constraints which affect their transportation systems. In addition to funding issues, economic conditions, environmental factors, and legislative mandates are all factors in target setting. For the Tri-State partners, factors associated with the northern climate are particularly concerning as the severity of the freeze thaw cycle on pavement performance should be considered. Consequently, it is essential that States have the flexibility to set targets, including targets that have performance holding steady or, in some situations, declining.

Tri-State partners recommend that the final rule include specific language stating that targets can be improving, remaining constant, or declining. The recognition that targets can indicate a decline in asset performance is made only in the preamble (discussion portion) of the NPRM, not in the proposed rule itself. We recommend specific language be included in the rule itself. In addition, we recommend that the measure for pavement cracking that takes into account the freeze thaw cycle resulting in a lower IRI in northern climates is specifically incorporated in the final rule.

2. **Accountability for Assets Under State DOT Control**

The reporting and management of non-State DOT assets, such as Federal Land Management Agency bridges/pavements, is currently a US DOT responsibility and should remain so. State DOTs have no direct authority to collect data on them. Requiring State DOTs to report on such assets would be a transfer of responsibility from the appropriate federal agency to the State DOTs without any authority, or additional funding, and it would hold State DOTs accountable for performance measures and targets outside of their control. The appropriate governmental entities responsible for these bridges and pavements should be required to develop their own targets best suited for their individual needs and report directly to the US DOT.

There are two overarching concerns with including non-State DOT controlled assets in the overall target setting and accountability process. First, State DOTs may be penalized for data they do not currently collect. For example, missing pavement condition segments would be classified as poor. Second, for non-State DOT controlled assets, the State DOT may have no authority to control how funding on those assets are spent or how it is to be maintained. Therefore, State DOTs should not be held responsible for the condition of these assets.

Another complicating factor is the reporting of bridge data. The NBI file that FHWA will use for evaluating State DOTs on these measures contains federally-owned bridges that are submitted by the respective federal agency, independently of the States' NBI submittal. State DOTs do not collect and/or report the NBI data for these bridges, nor do they have any control over what happens to these bridges. As a result, State DOTs should not be held accountable for noncompliance of these bridges. We therefore recommend that assets managed by entities other than State DOTs are reported by those entities, and that asset conditions do not count against State DOT performance targets.

3. **Selection of Minimum Performance Thresholds**

It is not clear to the Tri-State partners on how the US DOT developed the 5% 'Poor' minimal threshold for NHS-Interstate pavements. Why was this threshold not set at 10% to be consistent with the bridge rule? What is the asset management objective? What problem(s) are we trying to solve by utilizing the strategy of setting a target that requires 5% or less of NHS-Interstate pavements in poor condition? We know that the vast majority of States have asset sustainability ratios below 1, and in many instances significantly below 1. It would seem like performance criteria should reflect the USDOT's ability to fund asset infrastructure to an asset sustainability index of 1.

Two major concerns emanate from the 5% threshold. First, it can result in DOTs having to spend more of their funding on NHS (particularly Interstate) pavements, at a time when off-network federal-aid needs are increasing. Second, it is unclear how MPO funding would be impacted by this threshold, and how this would affect geographic equity considerations.

4. **Use of Standards for Performance Measures**

It is widely recognized that the IRI performance measure is ready for national implementation. IRI is unique in that it is suitable for both flexible and rigid pavements, State DOTs are already required to collect them for HPMS, and the measure can be collected with a single piece of equipment. The other three measures that examine overall structural health of the pavement (cracking/rutting/faulting) will require further development to be ready for deployment. Below is a summary of our concerns for each of the four performance metrics included in the NPRM:

- *Cracking (Asphalt)* - The definition of cracking is unclear, including how to measure the area of cracking. The condition determination is based on the definition of cracking percent, however, neither R55 nor PP67 are based on determining the cracking percent. R55 uses feet of cracking over square feet of surface area of the section. PP67 is based purely on the length of cracking. In addition, there is also concern about States using different technologies that can return different results. For example, could a higher resolution camera pick up finer cracking in pavements and skew pavement results to the negative, or could a lower resolution camera indicate an inflated value of 'good' pavements? The Tri-State partners feel that more work is required to identify the data collection requirements and interpretation of the cracking performance metric. Please refer to Attachment 1 for a more detailed treatment of cracking.

- *Rutting (Asphalt)*—The proposed processes for data collection allow for rutting measurements using either 5 point data collection or the automated transverse profile. There is a big difference between these two methods. The 5 point system can significantly underestimate rutting measurements and the differences between the two methods can lead to inconsistency in the data presented at the national level.

In addition, the white paper included in the docket information indicates that full depth reclamation activities are typically required to upgrade pavements in poor condition. Tri-State believes that this is contradictory to current pavement preservation methodologies and techniques.

5. **Costs Associated with Implementation**

The Tri-State partnership is concerned that this proposed rule will require State DOTs to collect more data at a higher frequency level and with a greater level of detail for an expanded transportation network with the expectation of increased data quality. These proposed changes are very significant and will result in higher management costs, particularly since this will require a reporting transition from current State DOT practices –

both in federal reporting and State statutory requirements. State DOTs do not have the additional resources to spend on increased data collection requirements, and the ongoing maintenance of these data.

We appreciate the opportunity to provide these comments and look forward to working with the US DOT in the implementation of final rules that are in accord with our suggestions. If you would like to discuss the issues raised in this letter, please contact:

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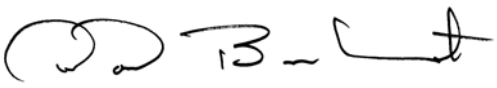
Sincerely,



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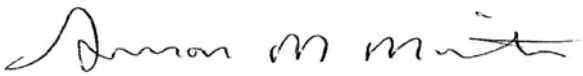

Susan M. Minter, Secretary
Vermont Agency of Transportation

Attachment 1

NHDOT Comments in Response to the Notice of Proposed Rule Making: National Performance Management Measures; Assessing Pavement Condition for the National Highway Performance Program and Bridge Condition for the National Highway Performance Program

Docket No. FHWA-2013-0053

RIN 2125-AF53

March 31, 2015

NHDOT has reviewed the Notice of Proposed Rule Making on National Performance Management Measures. Although the inclusion of cracking percent as a pavement condition metric is a major concern, generally NHDOT feels that it will be able to accommodate the stipulations contained in the NPRM. This list of comments describes the thoughts and concerns of the department with regard to cracking and other details contained in the NPRM.

International Roughness Index

We agree with using International Roughness Index (IRI) as the consistent measure of pavement roughness. Research has exposed difficulties in translating between various roughness measuring techniques currently available. Requiring one measure from all states will allow for clear comparisons to be made and IRI appears to be the most common measurement of pavement roughness in the United States on asphalt surfaced roads.

Defining Mainline Highway to Exclude Ramps

Excluding ramps from the definition of mainline highways is good forethought considering the full extent requirements for pavement data and the nature of ramps. Past experience has shown that collecting pavement data on ramps is a very detail oriented process with negligible impacts on the agencies' assessment of pavement condition. Features such as on ramps, off ramps, and slip ramps present at interstate exits require data collectors to often turn around as well as enter and exit numerous times to collect a comprehensive picture of a single interstate exit which often does not account for much in overall length. By excluding ramps significant wear and tear on data collection vehicles is spared.

Limiting Applicability to NHS

Limiting the initial scope to the NHS allows states to adjust their data collection protocols and standards as well as bridge and pavement management systems before addressing their entire transportation systems.

Support for Dual Carriageway

We are pleased to see pavement condition data requirements on both barrels of dual-carriageways, as part of this NPRM. NHDOT has been measuring pavement condition and other measurements on each carriageway for all of our interstates for several years and it has taken significant effort to combine the data for FHWA purposes. Requiring data for both barrels of divided interstates relieves us of that additional post-processing and creates a more comprehensive picture of the statewide pavement condition in our state.

Considering the support for dual-carriageways the reporting formats for several items in the proposed HPMS field included in the docket should be reviewed with attention to the consistency required by down-stream users of the data. Examples include item 6, ownership, and item 7, through lanes. Ownership should consider the bi-directional format to support FMIS, which intends to use HPMS data as its source. As for through lanes, requiring inventory direction for the reporting format and bi-directional format for AADT will limit calculations like DVMT without returning to the raw data or further post-processing.

Phase-In Approach for Interstates

The phase-in process proposed in the NPRM only relieves states from 2 interstate pavement items in their first submission; baseline condition and 2-year targets, and ignores all other new requirements. Considering setting both 2 and 4 year interstate targets will require the same data source relieving only 2-year target setting may be an oversight. More guidance should be provided regarding how to establish 4-year interstate targets in the absence of baseline condition or, when using baseline condition that was collected using protocols that differ from those now incorporated in the NPRM by reference.

Limiting the filtering of bridges to the federal definition

The federal definition of bridges require structures to be greater than 20 feet long; however, in New Hampshire we have several bridges that are shorter than 20 feet. Including pavement data over these bridges will often impact roughness just as larger structures do because many of them contain expansion joints or cause transverse cracking through expansion regardless.

Earlier Data Submissions to NBI and HPMS

The earlier deadlines for data submissions are concerning, particularly the deadline for pavement data to HPMS. The earlier deadlines seem to be proposed to allow time for FHWA to work with states to remedy issues with their data. However, this unnecessarily divides the HPMS submission and creates the need to go through evaluating possible issues twice. Additionally, the earlier deadline does not provide enough time for states that use semi-automated crack rating to collect, process, and check the data quality before working with their HPMS coordination to have the data submitted. Full extent collection and new data quality management requirements further exacerbate the situation. Consideration should be given to require the data on the traditional date of June 15th with a check of minimum condition thresholds at August 15th, the same date significant progress towards NHPP targets will be assessed.

Equal Minimums for All Climates

The minimum requirement of 5.0 percent poor condition on Interstate pavements and 10.0 percent structurally deficient bridge area on the NHS seem arbitrary and do not consider challenges between climates. The explanation provided in the white paper for the pavement condition minimum only anecdotally arrives at 5.0 percent and there is no explanation on how the bridge condition minimum was determined in the docket. Surely FHWA expects more reasonable explanations from states on how they have set their targets. Additionally, these thresholds should be re-evaluated with attention to climate regions across the nation. Given the actions of plows and salt on bridges and pavements in snowy climates it's simply more difficult and takes more resources to hold those assets to the same conditions of those placed in warmer climates.

Cracking

It's too premature to use cracking as a pavement condition metric considering the current state of the art. This sentiment is shared by AASHTO's Standing Committee on Performance Management, which requests a 3 to 5

year time interval before the use of cracking data to allow for technological development and standardization in crack rating.

The inclusion is even more concerning given the discussion of section 490.307 (page 364) where discouraging notes about nation-wide cracking percent measurements are presented. The notes describe that several states have not submitted any cracking data to HPMS and several states have only submitted cracking data for a limited portion of their roadway network. Also, anomalies raise questions regarding the accuracy of the data. Further discussion implies sampling methods are the cause for these issues suggesting collecting the data to the full extent will remedy problems. However, collecting cracking percent to full extent will significantly increase costs for states, such as NH, that use semi-automated crack rating (requiring substantial work performed by technical personnel) and will fail to address the discrepancies caused by differing technologies and state derived additional protocols. Until consistency can be achieved collecting that much cracking data will be a blatant waste of resources for many agencies.

There is simply too much variation between state derived protocols and numerous hardware and software technologies used for crack rating on the market. Unlike roughness and rutting measurements, which are primarily sensor driven, crack rating involves a range of human intervention, which introduces significant variation. Of the six methods for rating cracks presented in the HPMS manual all but 1 require some level of human work. The technical documents referenced by the NPRM discuss identifying distress but in very general terms. It's up to the states to develop additional protocol that guide crack rating technicians on how to quantify cracking percent. Some examples of where differences between technologies and additional protocols could affect reporting follow:

Extent of Area

There is a significant difference in the ability to identify the extent of cracking areas using the current state-of-the-art technologies. Here in New Hampshire, areas of cracking are identified using PathviewXP, software created by Pathways Services Inc. The crack rating features of the software work by requiring a technician to identify areas using rectangles. The lengths and widths of the rectangles are available as outputs and an area can be produced using those lengths and widths. Other technologies may benefit from a polygon that can have any number of sides. These polygons allow for a shape that captures the cracked area in a much more tightly form fitted manner and therefore the outputs are consistently lower than those using our technologies for the same real-world cracked area. None of the technical references, or the proposed revision to the HPMS field manual discussed in the NPRM, provides guidance on this issue.

Acceptable Images

The provisional protocol 68-14 incorporated by reference in this NPRM gives guidelines on determining if an image is adequate for the identification of cracks. The guidelines require that only 33% of cracks with width less than 3mm be identifiable. Depending on the technologies used, some states may be able to far exceed this minimum standard and quantify many more cracks than those that could just barely make it. The rule creates a situation where agencies with better technologies are more likely to be penalized because they can more readily label sections as poor for cracking.

Linear Cracks

AASHTO R55-10, the standard incorporated by reference into the NPRM describes transverse and longitudinal cracks, which are linear. Furthermore, figure 4.76 of the Proposed 2015 HPMS field manual shows linear cracking labeled low severity fatigue cracking. However, no guidance in any of the incorporated references describes the procedures for turning these linear distresses into areas. This creates a need for states to create

protocol that would determine if linear cracks should be ignored or if some width should be used to determine area. States that exclude would not have as much cracking percent. Guidance should be provided that explicitly describe exactly how to quantify an area for all types of cracking.

Fatigue Cracking or All Cracking

There is conflicting guidance regarding what types of cracking should be included in the measurements of cracking percent. The description for cracking percent in the proposed 2015 HPMS field manual implies all types of cracking should be included through the use of the term "visible cracking." Table 4.5, on the other hand, describes that cracking percent measured on type 2 surfaces (asphalt) should be measured by fatigue % area. If the intention is to measure only fatigue cracking, then the guidance in the description of cracking percent contradicts AASHTO R-55, which is incorporated in the NPRM by reference.

In AASHTO R-55, under section 4.2, fatigue cracking is isolated as load associated. Furthermore section 4.2.1 states that "increased cracking intensity in the wheelpath as compared with the non-wheelpath areas is assumed to quantify load-associated cracking." Finally section 4.2.2 states that cracking in non-wheelpath areas should be quantified as non-load associated. Strictly following AASHTO R-55 would cause cracking reported in cracking percent to only capture cracking in the wheelpaths when more intensity occurs than in the non-wheelpath areas. However, this disagrees with the notion that cracking percent should include all "visible cracking."

Standard Set of Images

Considering the differences between technologies and state derived protocols for quantifying cracks, some type of data set should be provided for states to use when calibrating their equipment and standards. The need for this type of example is also discussed in AASHTO 67-14, which is incorporated by reference into this NPRM, in section 4.2. The section states that a standard set of images could be created and used to control the performance of the method. This data set should include a range of cracking types, severities, and extents with accompanied HPMS output.

Phase-In

The phase-in scheme for interstate pavement condition fails to provide adequate time to adopt new cracking protocol. Per the NPRM, states should continue collecting cracking data under the current methods in the HPMS Field Manual (2014) for year 2015 and then start collecting cracking percent using the new methods in the proposed 2015 HPMS Field Manual for the 2016 data. Although the phase-in relieves states of the need to submit base line performance and 2-year targets, the cracking data collected in 2016 will be used for determining minimum pavement condition performance. This gives practically no time for states to become familiar with the new protocol and adjust their management systems accordingly. Furthermore, no guidance is provided as to how states should derive 4-year targets if they are using crack rating protocol that differs from what is in the Proposed 2015 HPMS field manual.