

TRI-STATE
PERFORMANCE MEASURES

2013 ANNUAL REPORT



DATE: 03/01/2014

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Executive summary:

Maine, New Hampshire, and Vermont, hereinafter referred to as “Cooperating States” or “Tri State”, have a strong working relationship, which has been forged through the continued sharing of information, coordinated material procurement, training exercises, and the cooperative development, implementation and support of the Managing Assets for Transportation System (MATS).

The Tri State recognized that performance standards were being discussed on a national scale by the United States Congress (Congress) as early as 2009 for incorporation into future Transportation Bills, by the American Association of State Highway and Transportation Officials (AASHTO), and by Federal Highway Administration (FHWA) for incorporation into respective stewardship agreements. It was also recognized that standard performance measures would benefit the Cooperating States by assisting in communications with each state’s respective stakeholders and customers. For these reasons the Tri States entered into a Memorandum of Understanding (MOU) in the fall of 2010 (Appendix A) to work together in developing Standard Performance Measures relating to asset conditions and business processes, and safety.

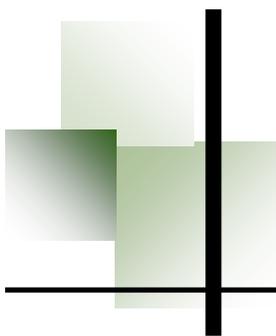
Since that time Congress has passed the federal transportation bill title Moving Ahead for Progress for the 21st Century (MAP-21), AASHTO has increased emphasis on performance measures within the work plan of the Standing Committee on Performance Management (SCOPM), and FHWA has begun the process of rulemaking per the implementation requirements in the MAP-21 regarding performance measures. The Tri State 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 in a number of national arenas as examples of how the MAP-21 language can work. These efforts have the three states well positioned to meet the requirements (establish performance targets) of the federal law anticipated to come into full effect on April 1, 2015. In addition, future collaboration along the Asset Management spectrum is anticipated as each state begins its process to comply with the new federal requirements.

Previous *Annual Tri State Reports* included asset performance measures for bridge & pavement condition, safety and traffic signs, business process performance measures for annual bid advertisement percent on time, annual dollar amount advertised compared to planned, and engineers estimate compared to low bid result started in 2010. These efforts have led to increased communications and efforts on issues relevant to all three states. For example, the act of comparing similar measures triggered Tri State workshops where member states have learned from one another on such topics as on time project delivery as well as highway safety.

In this year's report performance measures remained similar to previous years, with the exception of bridge conditions. This year includes, for the first time, a draft measure for bridges as outlined in a July 10, 2013 memo to the AASHTO's Subcommittee on Bridges and Structures (SCOBS) Chair Gregg Frederick (Wyoming DOT) from SCOBS Task Force Leader Bruce Johnson (Oregon). The Tri State agreed to "test drive" the measure and can report back to AASHTO on the results.

In years to come Tri State will continue to consider and evaluate inclusion of other new performance measures in this report that expands upon other assets and business processes. Without a doubt, and with "no fear", the Tri State members recognize the value in collaborating and comparing similar performance measures.

A thank you goes out to our varied stakeholders and customers in recognizing the value of this report, and for sharing our successes along the way.



Tri-State Business Performance Measures



Tri-State Performance Measures

As agencies of state government, the most important asset we can build and maintain is the trust of the people we serve. Trust in our agencies not only makes projects go easier, it makes legislative and executive funding decisions a more straightforward process. When the public and our partners in industry believe in our ability to deliver on promises, they become stronger advocates for our agencies’ goals, plans, and budgets.

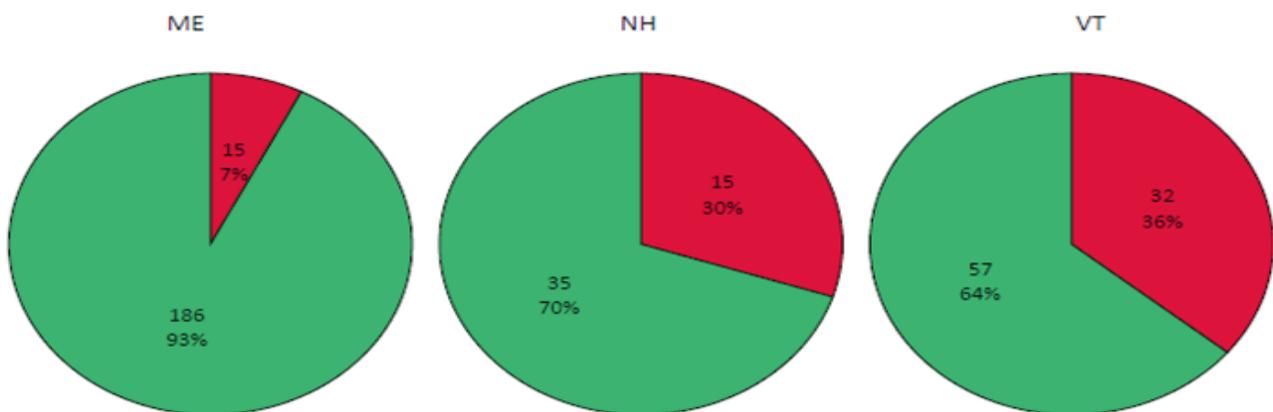
That trust is built by *consistently* doing three simple things: say what we intend to do, do it, and when necessary, clearly explain why something wasn’t done. In the realm of capital project development, it begins and ends with schedules, budgets, and the quality of our final products.

In the fall of 2010, representatives of MaineDOT, New Hampshire DOT, and Vermont AOT agreed to begin tracking some common performance measures in the area of operations and capital project production. It was an outcome of regular Tri-State Meetings among the management staffs of the three agencies.

Percent On-Time Delivery

A year earlier, MaineDOT had begun to measure and report on the quality of its project schedules, and their process was used as a framework for the first of the Tri-State measures, Percent On-Time Delivery. The basis for measurement is a calendar year Construction Advertisement Plan (CAP), published at or before the first of the year. The CAP includes all projects developed for advertisement by each agency’s in-house staff. Because it extends across an entire year, the standard for “On-Time” is advertisement within 30 days of the CAP date. The reports are issued quarterly. The green portion of the pie charts seen below represents the On Time percentage, by number of projects, at the time of the report. The schedule status for the remainder of the year (zeroes on this 4th Quarter example), and the projected year-end results are contained in the table beneath the pie charts.

Percentage Advertised On Time: 2013 Qtr 4 Results



State	Year-to-Date			Rest Of Year			Projected Year End		
	On Time	Delayed or Removed	% On Time	On Time	Delayed or Removed	% On Time	On Time	Delayed or Removed	% On Time
ME	186	15	93%	0	0	0%	186	15	93%
NH	35	15	70%	0	0	0%	35	15	70%
VT	57	32	64%	0	0	0%	57	32	64%

Total Delivery

The second measure reflects two aspects of program management: The accuracy of cost estimates in the original CAP (described above), and the volume of work added to our programs in an ad hoc manner. At the time of reporting, this measure compares the Construction Value advertised-to-date plus the Construction Value for projects added to the schedule after CAP publication, with the originally-estimated value of the projects included in the CAP. Construction Value refers only to the actual or estimated contract award amount for each project. It does not include PE, CE, or Right of Way costs.

**Total Construction Value Delivered: 2013 Qtr 4 Results
(All Dollars in Millions)**

State	Advertised to Date	Remainder of Calendar Year	Projected for Year	Construction Value of CAP	Percent of CAP
ME	\$ 222.27	\$0	\$222.27	\$224.94	99%
NH	\$ 165.01	\$0	\$165.01	\$175.60	94%
VT	\$207.79	\$0	\$207.79	\$193.43	107%

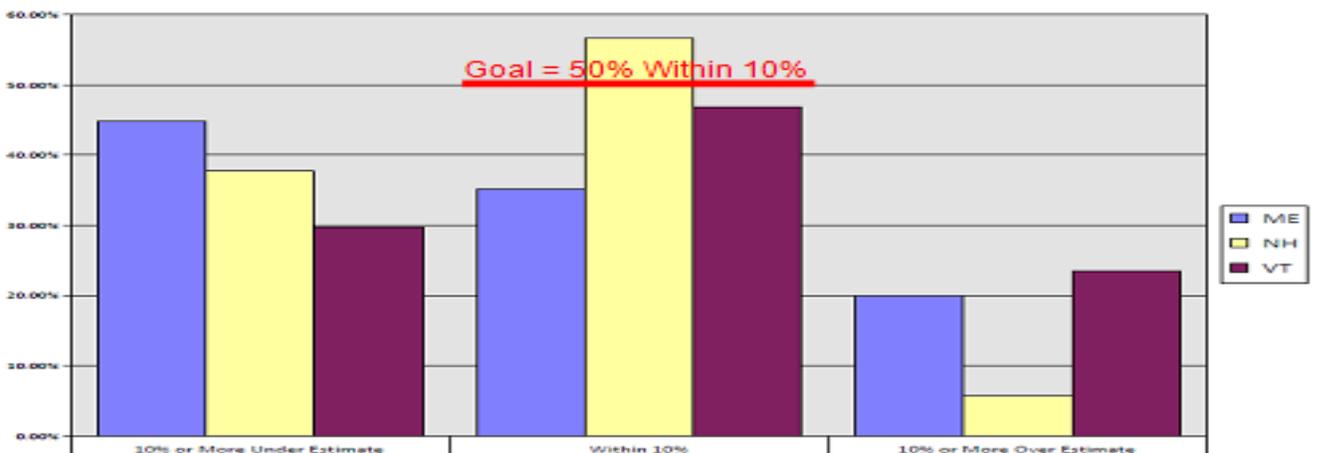
Estimate vs. Award

This measure is an assessment of our agencies’ ability to accurately anticipate project costs. Accurate cost estimation allows us to plan sufficient work to fully utilize the resources available, without the need to drop projects from the schedule as limited resources are used up. The goal for this measure is to have 50% of our projects come in within 10% of our estimated cost at the time of letting.

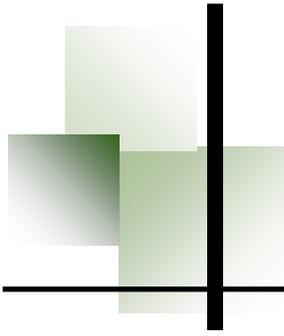
At each quarter, it reflects the results for all projects awarded up to that time. Unlike the first two measures, this one is not tied directly to the CAP.

This measure is an assessment of our agencies’ ability to accurately anticipate project costs. At each quarter, it will reflect the results for the year-to-date.

Award Amount vs. Cost Estimate: 2013 Qtr 4 Results



Projects	79	20	19	62	30	30	35	3	15
%	45	38	30	35	57	47	20	6	23



Tri-State Bridge Condition Performance Measure



Tri-State Performance Measures

Historically the “health” of the national network of bridges has been measured and compared amongst states utilizing Structural Deficiency as a tally of bridges and as a percentage of population. It is recognized that this measure as an indicator only focuses on the population of bridges in the poor to critical condition of bridges. As such the Tri-State partnership created the Bridge Condition Index (BCI). The BCI not only captures the overall range of condition ratings, it also weighs the condition by the size of the bridges. In this manner the network-wide BCI provides owners a better means to track the general health of their population of bridge assets utilizing data that has been collected similarly for over two decades.

The performance measures that the Tri-State uses are:

- Bridge Condition Index (BCI)
- % Structurally Deficient by Deck Area

Bridge Condition Index (BCI)

- $BCI = \text{Inventory Sum of (Individual Bridge Substructure Condition Rating*Individual Bridge Number of Spans) / (Total Number of Spans in Inventory)*50;$
- $+ \text{Inventory Sum of (Individual Bridge Superstructure Condition Rating*Individual Bridge Overall Span Length) / (Total Span Length in Inventory)*30 and;}$
- $+ \text{Inventory Sum of (Individual Bridge Deck Condition Rating*Individual Bridge Deck Area) / (Total Deck Area Inventory)*20}$

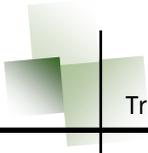
New Tri-State Performance Measure (A test-drive of an AASHTO idea)

AASHTO Subcommittee on Bridges and Structures (SCOBS) task force is in general concurrence with AASHTO’s Subcommittee on Performance Measures (SCOPM) with the following refinements and modifications:

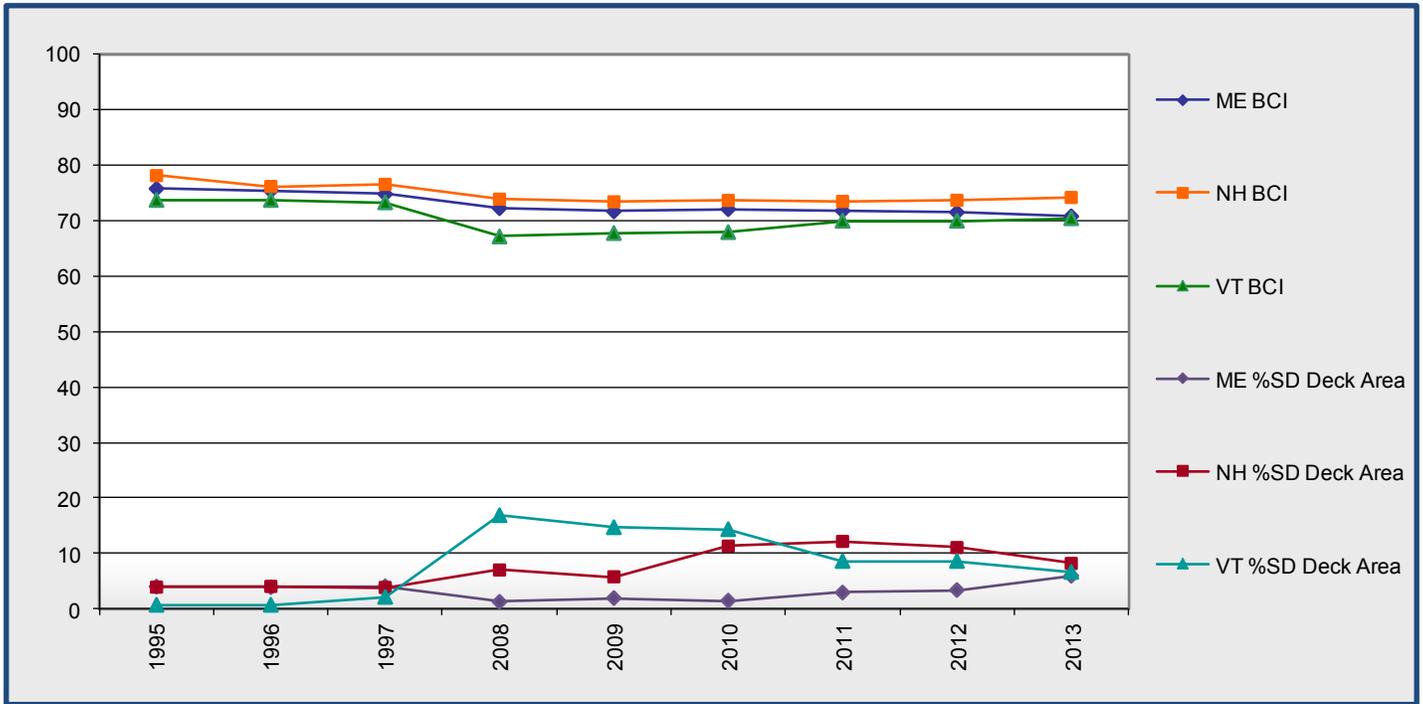
“The second measure should reinforce an asset management approach and show bridge preservation and replacement needs. Instead of using the terms Good, Fair, and Poor, the task force recommends the following work category descriptors: Cyclic Maintenance (CM) Preventative Maintenance (PM), and Rehabilitation and Replacement (R&R).”

The following chart shows each of the needs based categories with the NBI bridge condition ratings that make up the category.

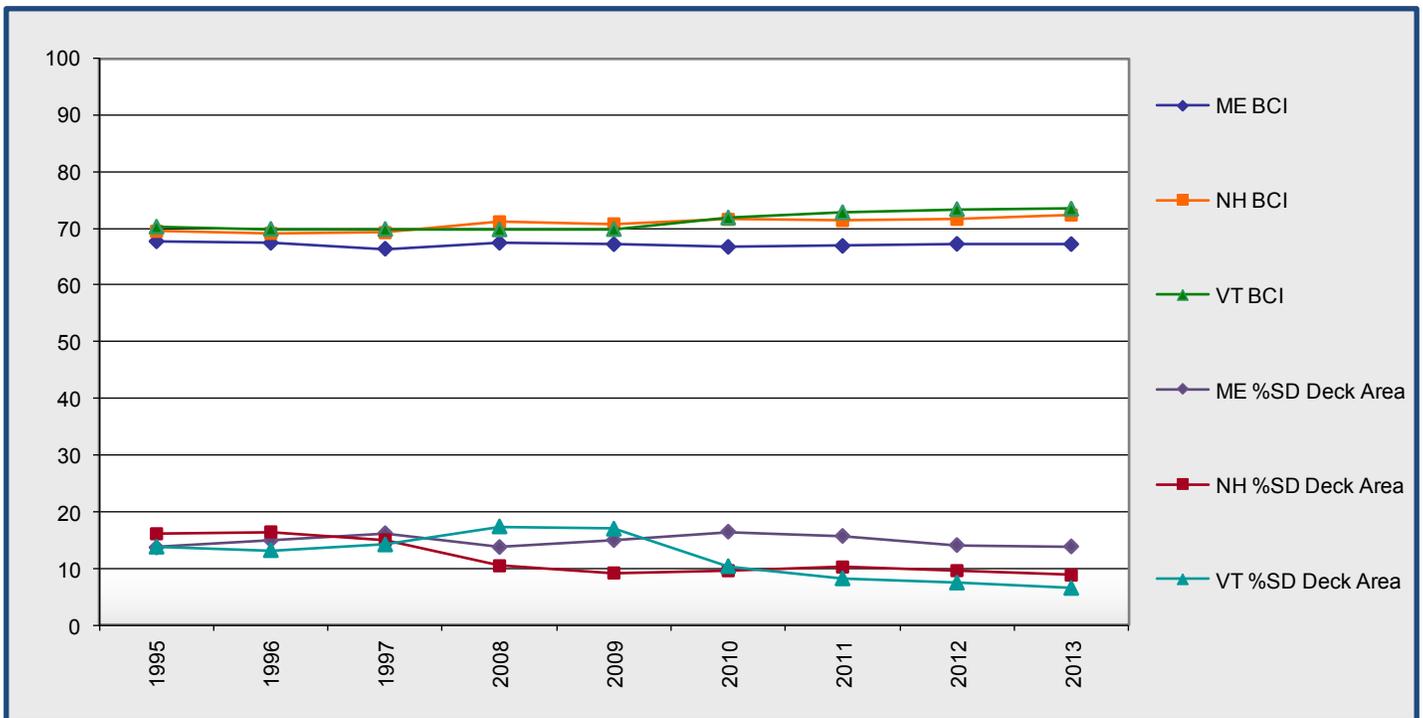


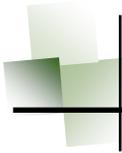


Bridge Condition Index (BCI) & % Structurally Deficient *Interstate System over Time



Bridge Condition Index (BCI) & % Structurally Deficient *State Highway System over Time

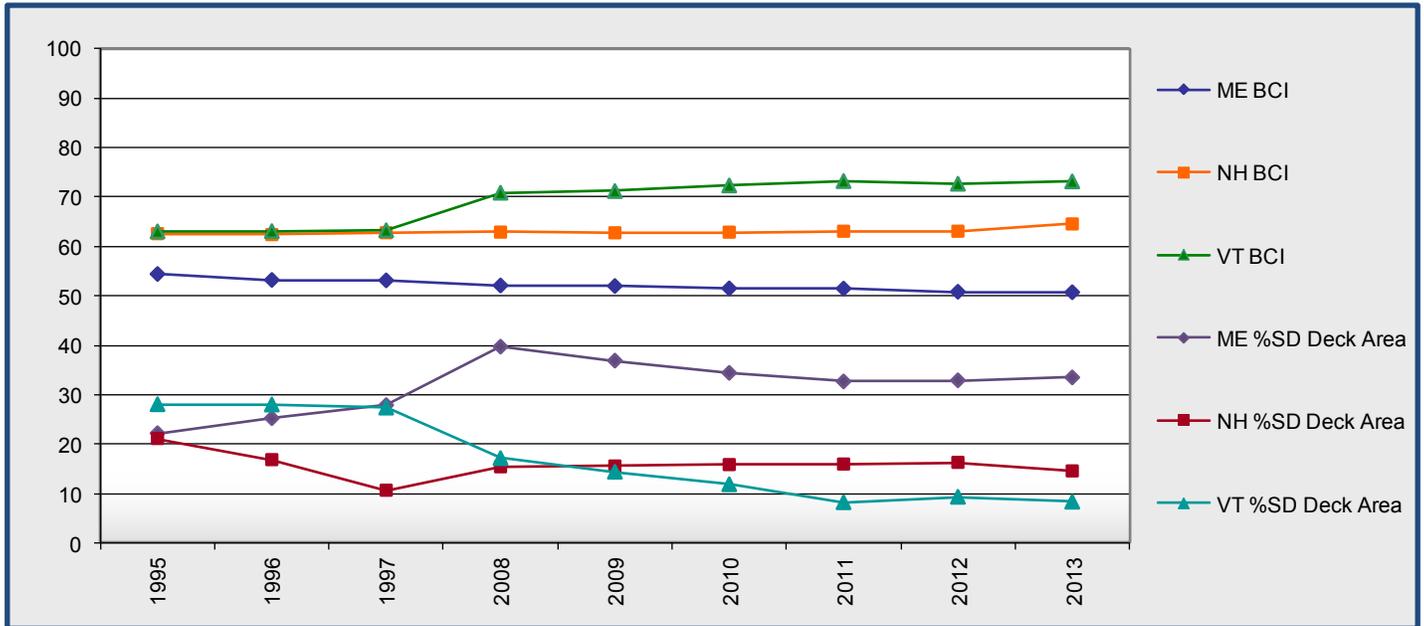




Bridge Condition Index (BCI) & % Structurally Deficient

* Local Highway System over Time

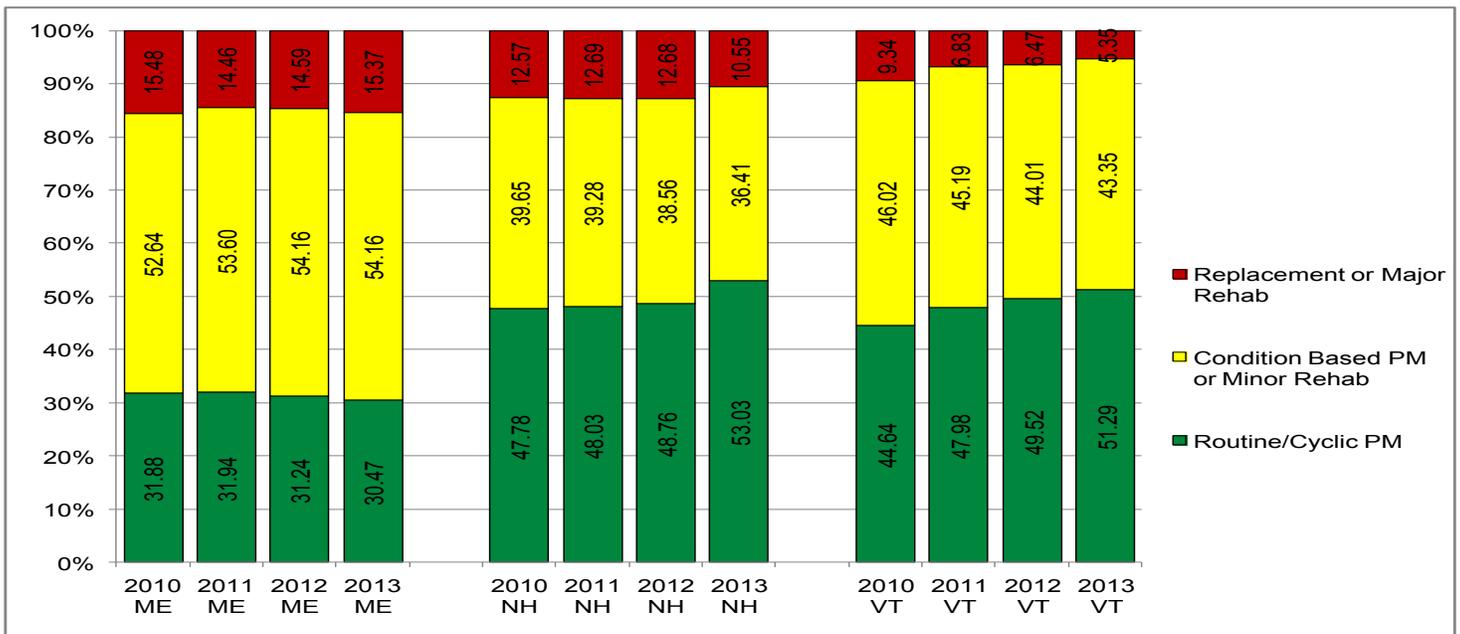
Based on 2013 Calendar Year NBI Data



The AASHTO "Test-Drive"

April 2010—April 2013 Bridge Conditions

* All Roadway Bridges





Tri-State

Pavement Condition

Performance Measure



It has been recognized that each of the Cooperating States have been collecting International Roughness Index (IRI) data on their respective highway networks for a number of years following established standards and protocols as part of their HPMS submittals. This protocol includes the IRI data taken while driving over both bridges and railroad crossing. Based on that this measure of condition was chosen for comparing the relative health of their pavement surfaces as well as an implicit measurement of the effectiveness of each Cooperating State's pavement management strategies. To further characterize and compare the condition of their respective highway networks IRI data has been compiled by functional classification to identify how each of the highway types compare and illustrate where similarities and differences may lie in the manner with which the Cooperating States prioritize the allocation of the funds made available for the management of pavements. FHWA recently updated the recommended classification designation coding, reducing the number of classes from 12 to 7 and making them more concise. The old codes map directly to the new codes based on the protocol established by FHWA providing a straightforward manner to utilize the new codes with existing historical data. Considering the efficiency gained from an illustrative standpoint the new codes were chosen for this effort.

Condition states were also assigned by establishing numeric thresholds for the IRI results equating to a Good, Fair, and Poor designation. Recognizing that higher type facilities such as interstates and other principal arterials, functional class 1 and 2, typically host higher travel speeds and larger traffic volumes by our respective users, a more rigorous breakpoint between Fair and Poor was utilized for the IRI as compared to all other facility types. The premise was that roughness would be perceived as less objectionable on those lower speed facilities. These separate and distinct thresholds were established based on FHWA recommendations as well as other references both of which are essentially recognized at the national level as being practical from a user perspective. Additionally, to evaluate how each Cooperating State manages their highway networks with respect to customer usage, IRI data was further categorized in a separate analysis by weighting the various roadway segments by vehicle miles traveled. This approach is meant to illustrate and emphasize the health of our networks, as experienced by the greatest number of users.

The tables and charts on the following pages show that the Cooperating States trend is toward maintaining their higher type facilities at a higher level of service in terms of smoothness as compared to remainder of the networks.

**Tri-State Performance Measure
2012 Pavement Condition - International Roughness Index (IRI)**

Percentage based on Miles

Functional Class *	ME		NH		VT		ME		NH		VT		ME		NH		VT							
	Collected Miles in Functional Class						Good IRI < 95 in/mi						Fair IRI ≥ 95 in/mi and ≤ 170 in/mi						Poor IRI > 170 in/mi					
	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles		
1	87%	634	89%	403	100%	639	13%	94	9%	42	0%	1	0%	3	2%	7	0%	0	0%	0	0%	0		
2	63%	20	89%	133	95%	14	34%	11	9%	14	5%	1	3%	1	2%	3	0%	0	0%	0	0%	0		
3	50%	466	65%	359	59%	263	46%	431	31%	174	40%	179	4%	38	4%	24	0%	2	0%	2	0%	2		
4	39%	492	48%	424	4%	31	55%	687	43%	375	95%	776	6%	79	9%	78	1%	11	1%	11	1%	11		
5	16%	607	28%	366	12%	142	61%	2291	55%	723	72%	850	22%	840	18%	232	16%	185	16%	185	16%	185		
6	6%	127	11%	93	15%	1	57%	1240	46%	388	6%	1	37%	790	43%	357	78%	7	78%	7	78%	7		
7			9%	35					33%	130					58%	225								
Total	27%	2346	40%	1812	35%	1090	54%	4754	40%	1846	58%	1807	20%	1751	20%	925	7%	205	7%	205	7%	205	7%	205

Percentage based on VMT (Vehicle Miles Traveled)

Functional Class *	ME		NH		VT		ME		NH		VT		ME		NH		VT							
	VMT in Functional Class (x10 ³)						Good IRI < 95 in/mi						Fair IRI ≥ 95 in/mi and ≤ 170 in/mi						Poor IRI > 170 in/mi					
	Percent	VMT	Percent	VMT	Percent	VMT	Percent	VMT	Percent	VMT	Percent	VMT	Percent	VMT	Percent	VMT	Percent	VMT	Percent	VMT	Percent	VMT		
1	90%	2721	93%	7162	99%	4442	10%	313	6%	497	1%	24	0%	4	1%	68	0%	0	0%	0	0%	0		
2	73%	97	90%	3175	98%	125	26%	34	8%	281	2%	3	2%	2	2%	62	0%	0	0%	0	0%	0		
3	49%	1218	62%	3943	51%	1601	46%	1159	33%	2100	49%	1534	5%	128	5%	326	1%	17	1%	17	1%	17		
4	35%	942	48%	3415	6%	184	58%	1531	43%	3099	93%	2994	7%	181	9%	633	2%	53	2%	53	2%	53		
5	19%	600	34%	1469	18%	416	62%	1914	54%	2302	68%	1586	19%	588	12%	506	14%	319	14%	319	14%	319		
6	7%	54	16%	199	61%	4	60%	493	51%	623	3%	0	33%	273	33%	410	36%	2	36%	2	36%	2		
7			15%	77					46%	234					39%	200								
Total	46%	5632	63%	19440	51%	6772	44%	5444	30%	9135	46%	6141	10%	1176	7%	2205	3%	391	3%	391	3%	391	3%	391

Functional Class	Good			Fair			Poor		
	IRI < 95	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170
1	Interstate	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170
2	Other Freeways and Expressways	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170
3	Other Principal Arterial	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170
4	Minor Arterial	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170
5	Major Collector	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170
6	Minor Collector	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170
7	Local	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170	IRI ≥ 95 and ≤ 170	IRI ≥ 95 and ≤ 170	IRI > 170

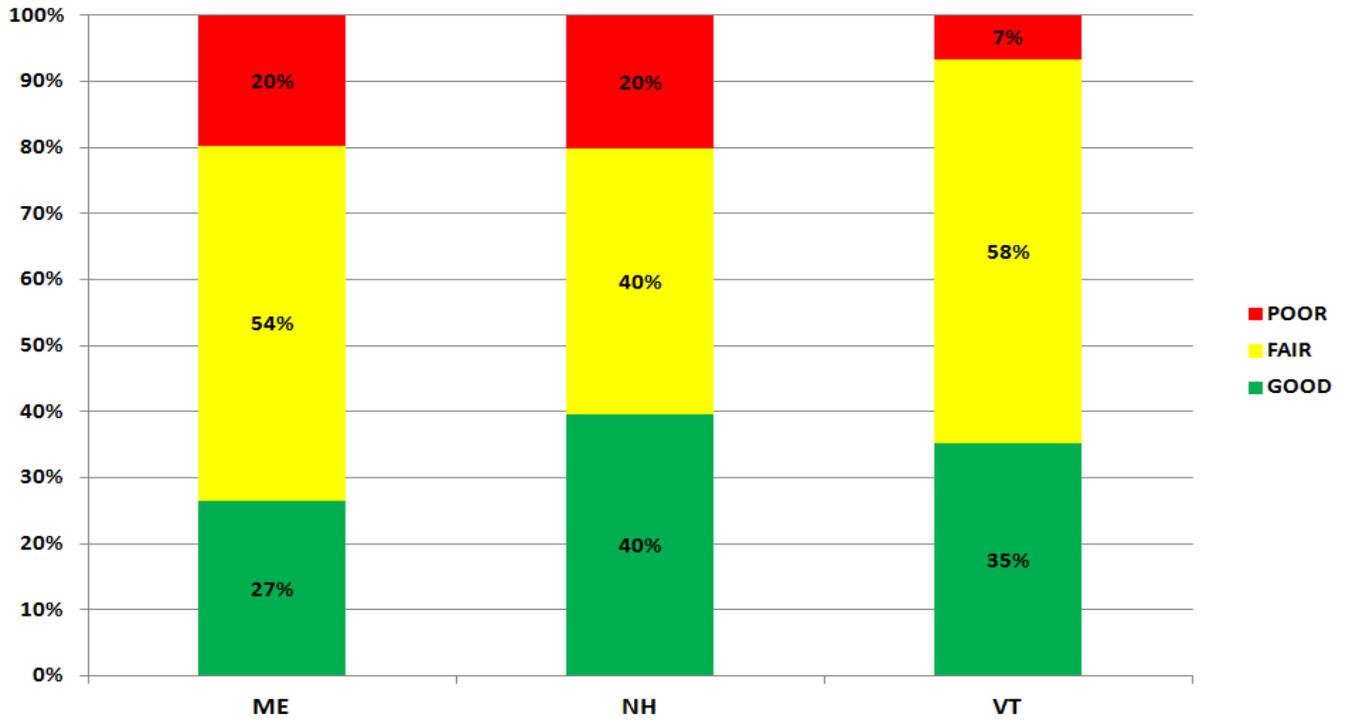
Notes: 1. Divided highways are reported in barrel miles and all other roads are reported in centerline miles.

2. New Hampshire data is comprised of data collected with the Pathway vehicle. The NHS (including Interstates and Turnpikes) and Unnumbered roads were collected in 2012 and the remaining (non-NHS) NH and US routes

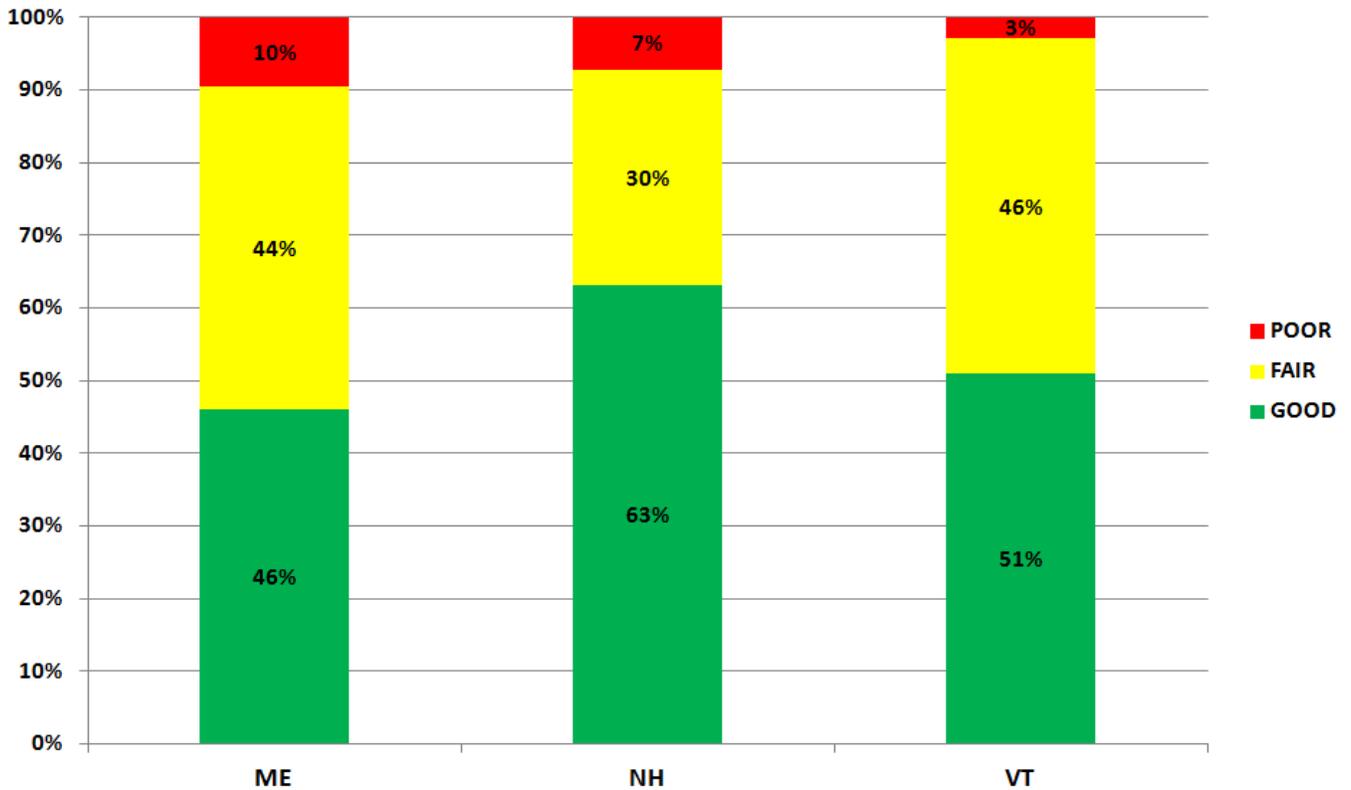
3. Maine data is comprised of data collected with the ARAM vehicle in 2011 and 2012 (all interstate data is from 2012).

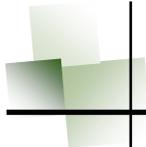
4. Vermont condition data is comprised of data collected by Fugro-Roadware and VAOT in 2012. Vermont traffic data is from 2010.

All Highways Condition by Miles

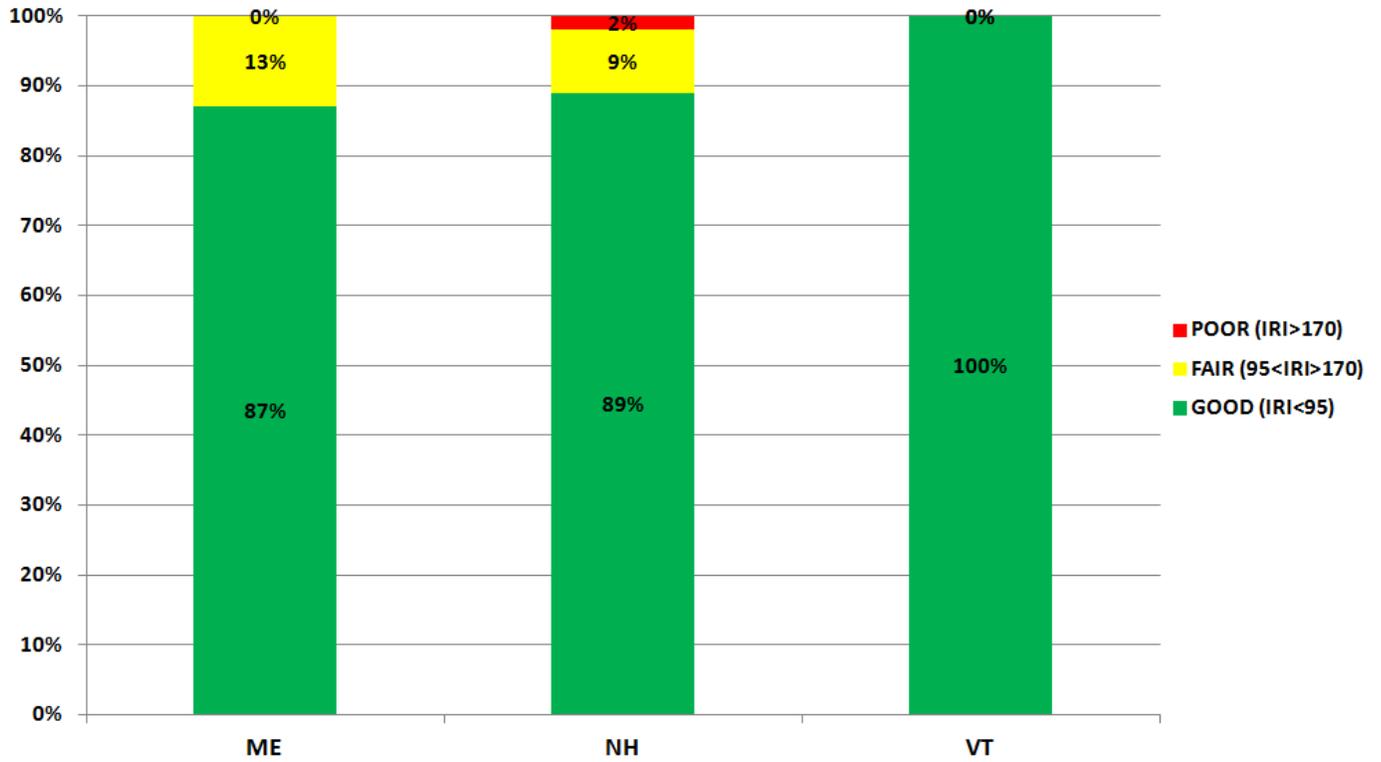


All Highways Condition by VMT

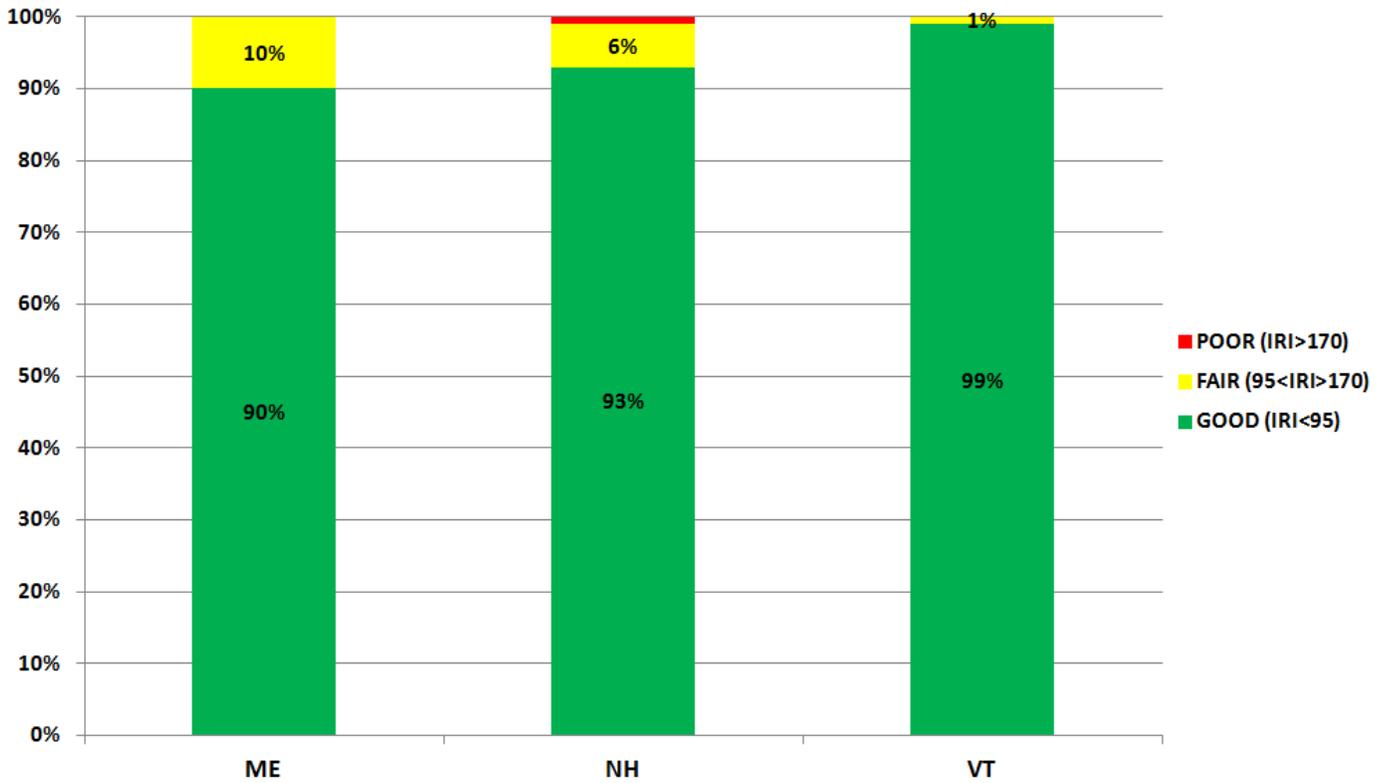




Interstate Condition by Miles



Interstate Condition by VMT





**Tri-State
Sign
Performance Measure**



Introduction:

Traffic signs provide an important means of communication for all roadway users. They are intended to promote safety by supplying advanced warning of upcoming regulatory, warning or guidance information. In addition to daylight hours, traffic control mechanisms must be capable of conveying this information during inclement weather and evening hours when there may be little to no contribution from overhead lighting (1). Therefore, the appearance and proper recognition of traffic control devices is essential for the overall safety of the traveling public.

The Federal Highway Administration (FHWA) has mandated retroreflectivity requirements for traffic signs. To comply with these requirements, requires that public agencies implement a management method that will ensure that the retroreflectivity levels for traffic signs are maintained at or above the minimum levels specified in the Manual on Uniform Traffic Control Devices (MUTCD).

The purpose of this document is to summarize the Tri-State efforts in working towards a common performance measure for traffic signs. In order to better understand how the sign performance measure was selected it is worthwhile taking a look at traffic sign management in each state.

State Traffic Sign Summaries:

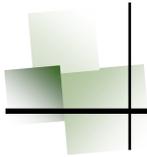
Vermont

The Vermont Agency of Transportation (VTrans) is responsible for approximately 69,200 active traffic signs statewide along 2,704 miles of state owned highway system. This is comprised of 703 miles of National Highway System, 320 of which is Interstate miles.

The management of the sign system is accomplished through the combined efforts of both the Program Development Division and the Operations Division. Program Development is responsible for MUTCD compliance, sign project selection and sign data management whereas the Operations Division is responsible for sign maintenance and installation.

VTrans uses sign age as a management method. This is supported by the use of a proprietary sign management software that has been in place since 1996. While this system provides a framework for managing sign data there are areas where improvement is desired. To this end, efforts are under way which will enable the use of the Tri-State Managing Assets for Transportation Systems (MATS) for this function. The sign inventory system manages over 30 attributes on each active traffic sign. A few of these attributes are location information, age, MUTCD/state code, support information and work history. This data comes from various sources but primarily from project plans and Traffic Operations work orders.

In looking at this past year there are two items that are noteworthy. The first is that approximately 127 miles of traffic signs were replaced through construction projects and the second is the Statewide Sign Data Reconciliation project. The reconciliation project is a comprehensive review of the statewide sign database and is expected to be completed in 2014.



New Hampshire

The New Hampshire Department of Transportation (NHDOT) is responsible for 49,395 traffic signs statewide along 3,120 center line miles of state owned highway system. This is comprised of 790 miles of National Highway System, 301 of which is Interstate/Turnpike miles.

The management of the sign system is accomplished through the Bureau of Traffic. Both individual sign replacements due to age and damage, and program sign replacements using State and Federal funds are managed out of the Traffic Bureau.

NHDOT is the early stages of collecting sign inventory and like Vermont we will be utilizing the MATS asset management module to keep track of sign work orders and accomplishments. Until this inventory is complete we will use the data collected to date and extrapolate to obtain statewide totals. This assumes the condition of the signing statewide is uniform.

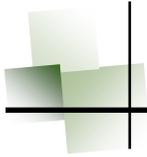
To address the MUTCD requirement regarding minimum retroreflectivity NHDOT began a night riding program in 2009 to replace signs based on their appearance at night. This type of replacement program is not data driven and only requires a trained eye to determine if a sign should be replaced. This approach should get the Department in compliance by 2014, if one fifth of each district is ridden in each year. This approach will allow NHDOT to reach the mandated minimums, using existing resources in the short term, and to develop a sustainable plan moving forward. The number of substandard signs to be found by night riding is unknown, and funding will play a role in the rate that progress is made. However, using the data obtained from this process will give us a measure of performance, this can be measured and is comparable from one year to the next.

In 2013 the number of signs identified below service life during our visual night time inspection was 1,399. The inventory is extrapolated to be 49,395 signs with an extrapolated 6,995 signs below service life or 14% of the total inventory. This leaves 86% of the total above service life which is about 20 points higher than last year. This change is in part due to the fact that 2013 was the fifth cycle of driving our secondary roads for night review. It is expected that as this program continues and the inventory is completed that the number of signs below service life will lower to around 5%.

Maine

The Maine Department of Transportation (MEDOT) is responsible for approximately 67,000 traffic signs statewide along 8,600 miles of state-owned highway. The system includes 1,330 miles of National Highway System, 367 miles of which is interstate. To date MDOT has inventoried over 8,000 miles (not including interstate) and it is extrapolated that there are 80,000 signs under state responsibility.

Sign management is the responsibility of the Traffic Engineering Division in the Bureau of Maintenance and Operations (M & O). Sign replacement, due to age and damage, as well as sign



replacement using State and Federal funds is performed by maintenance crews in each Region within the Bureau of M & O.

MEDOT is approximately 98% compliant on regulatory and warning signs statewide. We are currently making a big push to bring our guide signs into compliance and adding mileage to all destinations. We have approximately 90% compliance on reflectivity on statewide guide signs. Our interstate guide signs are next on our list. We are approximately 50% compliant at this point and over the next two years, we plan to bring the rest into compliance with our maintenance crews.

ME DOT is currently trying to complete the sign inventories statewide. Their interstate signs are 100% complete in MATS, unfortunately the inventory collected for the 2012-2013 statewide sign installation project was not in the correct format to transfer into MATS. ME-DOT is trying to salvage that data, but if this isn't possible they will look at other alternatives for data collection.

Performance Measure:

Maine, Vermont and New Hampshire share a common goal of having a sign performance measure that will provide a benchmark on the overall sign system. This performance measure will allow the three states a common reference point from which to view their systems and will aid in the continued cooperative sharing of information between the three states.

In 2010 the three states worked together to accomplish the above recognizing that each state has different degrees of data granularity available. As a starting point the different sign management systems were discussed and summarized by systematically stepping through the pros and cons of various possible measures while keeping in mind what data was available and feasible for each state. The result of these efforts was the choice of Percent of Non - Interstate Signs Above Service Life as the most appropriate performance measure was established

Percent of Non - Interstate Signs Above Service Life is an indicator of those signs that are still functioning as intended and are providing adequate guidance to the traveling public. These signs have not unduly deteriorated due to various factors such as age, loss of retroreflectivity or damage. The table below gives a snap shot of what the current percentage looks like for each state as well as the management method currently being used to make that determination.



Table 1: Existing % signs above service life.

State	Current % Above Service Life	Method
New Hampshire	86 %	Night Time Visual Assessment
Vermont	80 % *	Sign age
Maine	98 %	Sign Age

*as of 2012. The VTrans sign database is undergoing a statewide reconciliation and as such a 2013 sign age analysis was not re-run. The sign age analysis will be completed once the reconciliation is completed in mid 2014. It is recognized that this measure will need to be revisited in the future as each state’s signs database matures and changes.

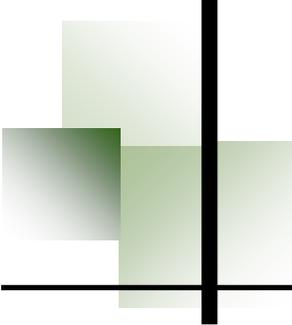
Performance Measure Yearly Reporting:

The Tri-State sign performance measure of Percent Signs above Service Life is a snapshot of the respective state sign systems. As a snapshot it tells us the current status of the non-interstate sign system. All three states will submit their yearly sign performance measure as identified in the table above to VTrans for incorporation into the final report. This information is due to VTrans by December 1 with a final report being due to management on January 1.

It is recognized that this measure will need to be revisited in the future as each state’s signs database matures and changes.

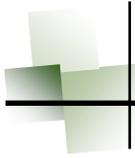
References:

1. U.S. Department of Transportation – Federal Highway administration (FHWA). “MUTCD Overview.” FHWA-Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD). 12/05/2007. <http://mutcd.fhwa.dot.gov/kno-overview.htm>.
2. Vermont Agency of Transportation Materials and Research Section, “Evaluation of Measuring Methods for Traffic Sign Retroreflectivity Final Report, Report 2009-8, Wendy M.E. Kipp and Jennifer M.V. Fitch.
3. National Cooperative Highway Research Program, “Performance Measures and Targets for Transportation Asset Management”, NCHRP Report 551,
4. Tri State Agreement for Standardized Performance Measures Memorandum of Understanding, dated August 19, 2010.



**Tri-State
Safety
Performance Measure**





The Tri State partners recognize that highway safety is not the responsibility of any one group or agency but is the combined responsibility of many agencies and departments. As such, each state has a Strategic Highway Safety Plan (SHSP), developed with the input from state and federal agencies, municipalities, industry and the business community, that puts forth those critical emphasis areas (CEA) that would offer the greatest potential for reducing major crashes in their state. In the broader context of safety, the SHSP is meant to be implemented in conjunction with other state safety plans. An overview of each states SHSP with corresponding emphasis was done in 2011. It was found that although each state has CEAs that are unique to that state, we do share 6 CEAs. These are Speed, Safety Belts, Young Drivers, Impaired Drivers, Distracted Drivers and Intersections.

With the SHSP plans in mind, the Safety Performance Measure Working Group sought a performance measure that would complement these efforts. To this end, the group chose the national vision of Toward Zero Deaths with a corresponding performance measure of reducing the fatality 5 year rolling average by 50% by the year 2030. While Towards Zero Deaths is tracking the actual number of deaths it was thought that a measure that takes vehicle miles traveled into account would help round out the picture of safety on our highways. To this end, the fatality rate per one hundred million vehicle miles traveled and fatal plus incapacitating injuries per one hundred million vehicle miles was selected to report.

Toward Zero Deaths is a national strategy sponsored and supported by the Federal Highway Administration (FHWA) and the American Association of Highway Transportation Officials (AASHTO) that focuses on using data driven processes to identify and create opportunities for changing the highway safety culture. This strategy recognizes that with over 35,000 fatalities occurring on our Nation's highways each year highway safety remains a challenge for all of us and is depicted in the following graphs.

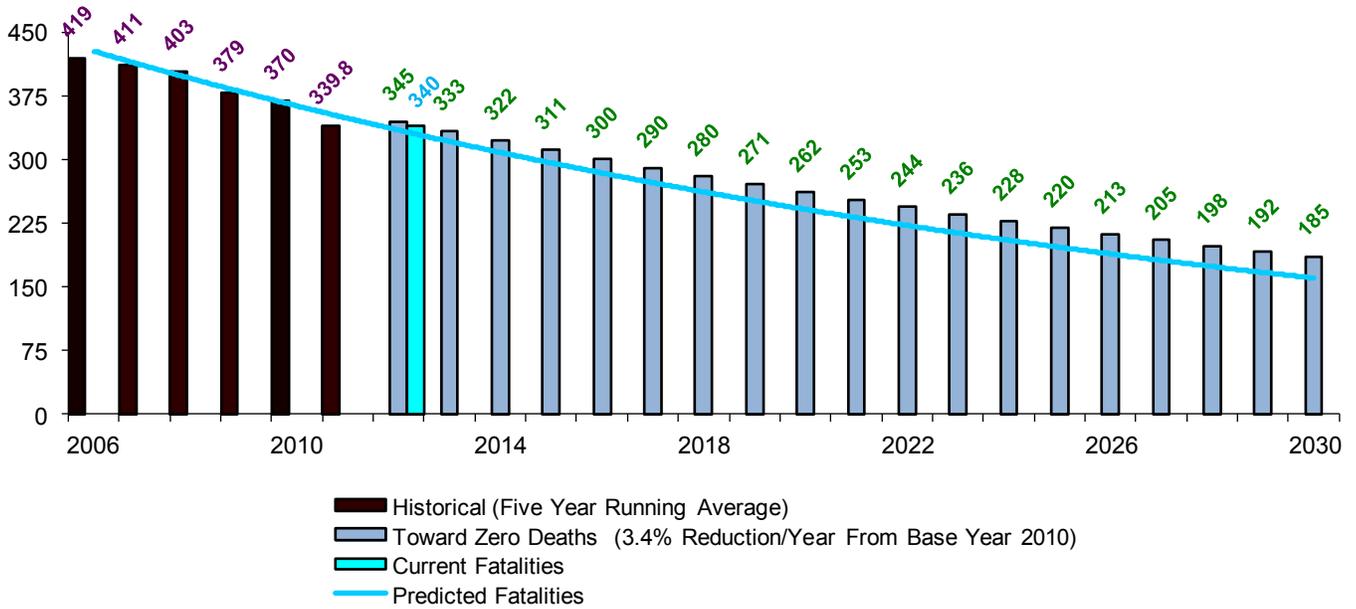
Graph 1 shows us the Tri State combined trends, forecasts and goals. Based on the current trend in yearly fatalities, the goal of having the 5 year average reduced by 50% by the year 2030 will be achieved provided a 3.4% per year reduction. Graphs 2 – 4 show us what goal looks like for each individual state based on their individual trends and forecasts. It is worth noting that adjustments to the trend lines are likely as the national campaign progresses and as our data matures.

Table 1 shows both the fatality rate and the fatality plus incapacitating injury rate. These rates are calculated using the actual number of either fatalities or fatalities plus incapacitating injuries and then dividing the respective number by hundred million vehicle miles traveled.

In summary Towards Zero Deaths embraces that even one death on our highways is unacceptable and to achieve that goal will take a collaborative effort between many disciplines and agencies both on the state level and the national level.

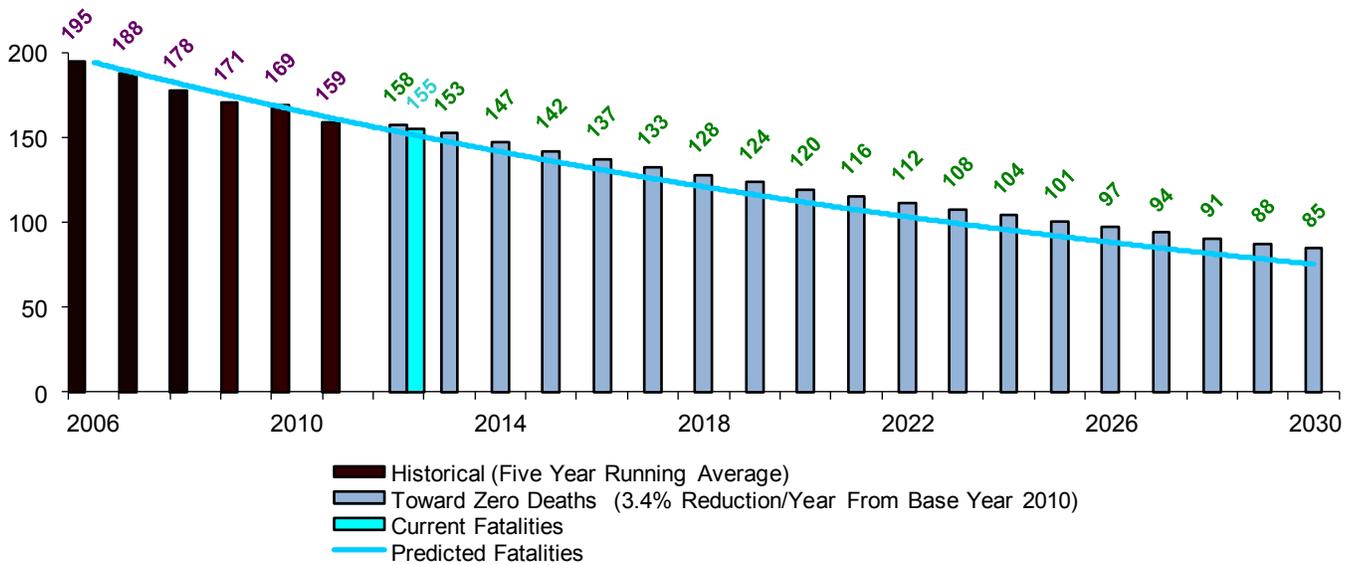
Graph 1: Tri State Toward Zero Deaths Goal

**TRI - STATE TRAFFIC SAFETY PERFORMANCE MEASURES
MAINE - NEW HAMPSHIRE - VERMONT
TRENDS - FORECASTS - GOALS**



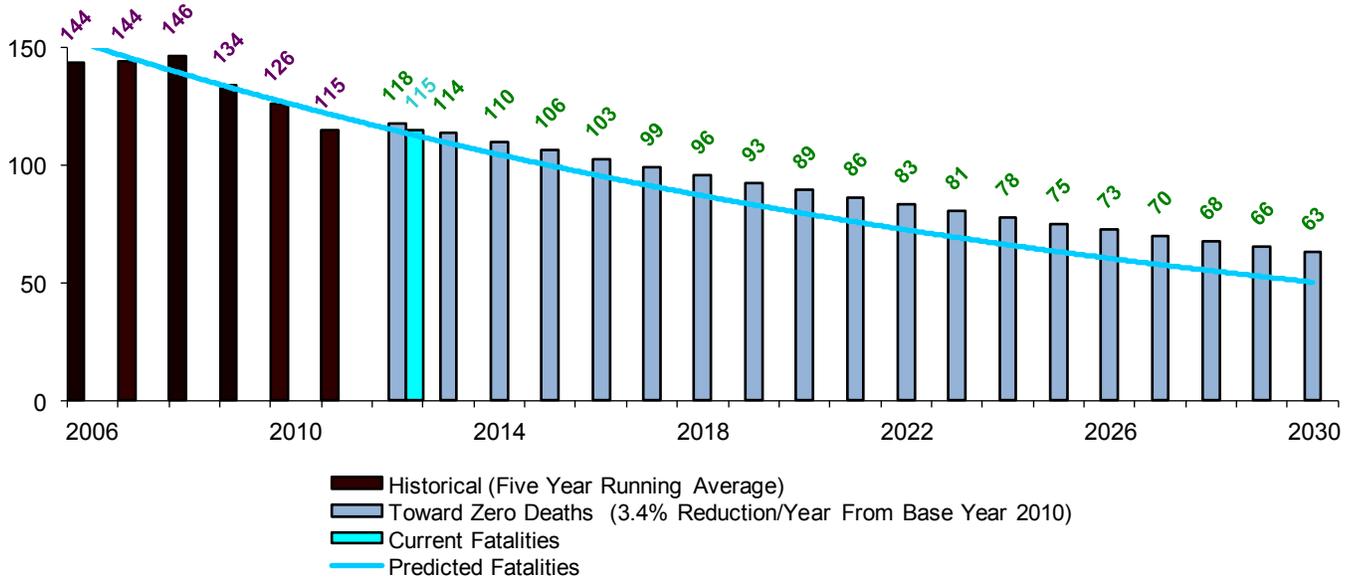
Graph 2: Maine: Toward Zero Deaths

**TRI - STATE TRAFFIC SAFETY PERFORMANCE MEASURES
MAINE
TRENDS - FORECASTS - GOALS**



Graph 3: New Hampshire: Toward Zero Deaths

**TRI - STATE TRAFFIC SAFETY PERFORMANCE MEASURES
NEW HAMPSHIRE
TRENDS - FORECASTS - GOALS**



Graph 4: Vermont: Toward Zero Deaths

**TRI - STATE TRAFFIC SAFETY PERFORMANCE MEASURES
VERMONT
TRENDS - FORECASTS - GOALS**

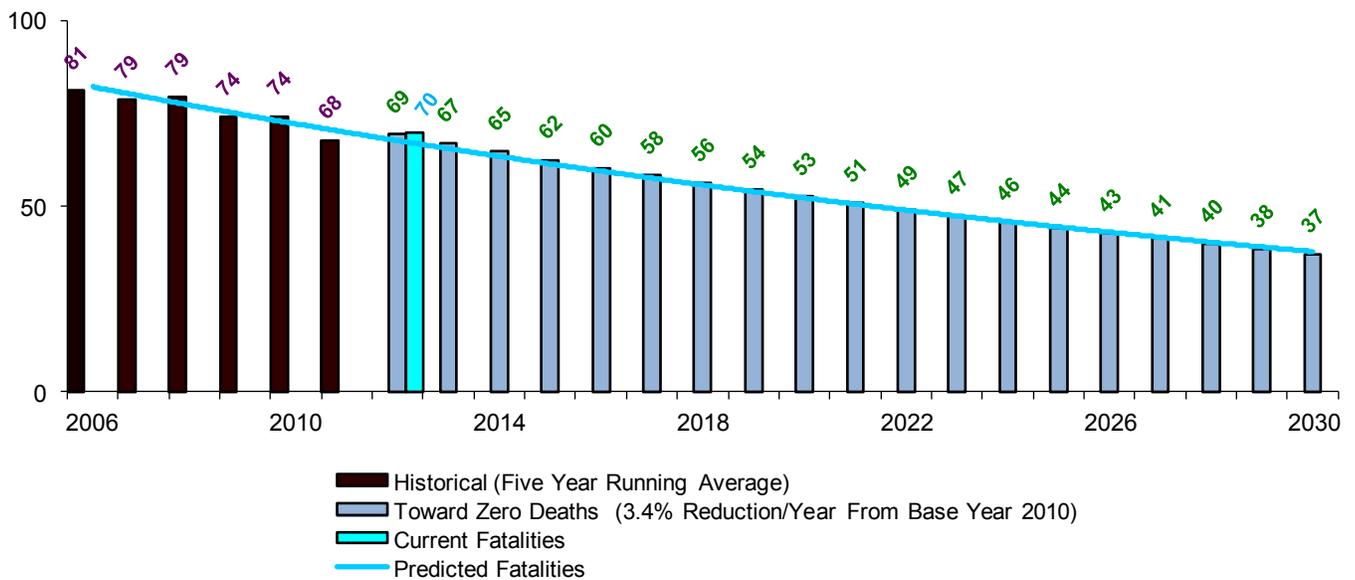


Table 1: Fatality Rate and F+I Rate.

Maine					
Year	Fatalities (K - Severity)	HMVM	Fatality Rate (per/HMVM)	Incapaciting (A - Severity)	K+A Severity Rate
2008	155	145.32	1.07	869	7.05
2009	159	144.82	1.10	733	6.16
2010	161	145.49	1.11	782	6.48
2011	136	142.98	0.95	876	7.08
2012	164	143.69	1.14	982	7.98
<i>(5 YR Totals)</i>	775	722.3		4242	
5 YEAR AVG	155.00	144.46	1.07	848.40	6.95

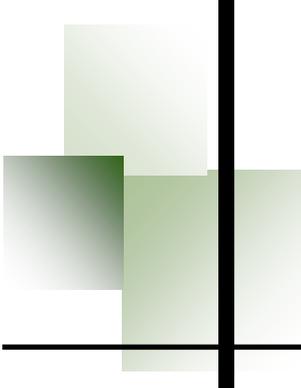
New Hampshire					
Year	Fatalities (K - Severity)	HMVM	Fatality Rate (per/HMVM)	Incapaciting (A - Severity)	K+A Severity Rate
2008	138	130.19	1.06	589	5.58
2009	110	129.41	0.85	662	5.97
2010	128	130.19	0.98	528	5.04
2011	90	130.61	0.69	542	4.84
2012	108	128.61	0.84	595	5.47
<i>(5 YR Totals)</i>	574	649.01		2916	
5 YEAR AVG	114.80	130	0.88	583.20	5.38

Vermont					
Year	Fatalities (K - Severity)	HMVM	Fatality Rate (per/HMVM)	Incapaciting (A - Severity)	K+A Severity Rate
2008	73	71.76	1.00	427	6.97
2009	73	75.37	0.97	394	6.20
2010	71	72.40	0.87	409	6.63
2011	55	71.40	0.77	387	6.19
2012	77	71.96	1.07	311	5.39
<i>(5 YR Totals)</i>	349	362.89		1928	
5 YEAR AVG	69.80	72.58	0.94	385.60	6.28

Tri-State					
Year	Fatalities (K - Severity)	HMVM	Fatality Rate (per/HMVM)	Incapaciting (A - Severity)	K+A Severity Rate
2008	366	347.27	1.05	1885	6.48
2009	342	349.60	0.98	1789	6.10
2010	360	348.08	1.03	1719	5.97
2011	281	344.99	0.81	1805	6.05
2012	349	344.26	1.01	1888	6.50
<i>(5 YR Totals)</i>	1698	1734.20		9086	
5 YEAR AVG	339.60	346.84	0.98	1817.20	6.22

References:

1. National Highway Traffic Safety Administration, Fatality Analysis Reporting System, <http://www-fars.nhtsa.dot.gov/Main/index.aspx>
2. Vermont Agency of Transportation, Policy and Planning Highway Research Crash Data
3. Tri State Agreement for Standardized Performance Measures Memorandum of Understanding, dated August 19, 2010.
4. “A Primer on Safety Performance Measures for the Transportation Planning Process”, US. Department of Transportation Federal highway Administration, Report # FHWA-HEP-09-043, September 2009.
5. “American Association of State Transportation Officials Strategic Highway Safety Plan”, 2005, www.transportation.org.
6. “Strategic Highway Safety Plan for Vermont, A Public/Private Collaborative & Multi-discipline Framework for Reducing Fatal and Serious Injury Crashes”, December 2006.
7. “New Hampshire Strategic Highway Safety Plan, Driving Toward Zero Deaths”, 2012.
8. “Maine Strategic Highway Safety Plan”, 2010.
9. “Traffic Safety Performance Measures for States and Federal Agencies”, U.S. Department of Transportation National Highway Traffic Safety Administration DOT HS 811 025, August 2008.



Tri-State

**Appendix A:
Tri-State Memorandum
of Understanding**



TRI-STATE AGREEMENT FOR STANDARDIZED PERFORMANCE MEASURES

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding is made this 19th day of August, 2010 by and among the States of Vermont, Maine, and New Hampshire hereinafter "the Cooperating States").

WHEREAS the Cooperating States already have a strong working relationship through the Tri-State arrangement to include MATS development, material procurement, training exercises, and simply sharing of information, and

WHEREAS the Cooperating States recognize performance measures for assets and business processes are being utilized and further developed in each state, and

WHEREAS performance measures for assets and business processes are being incorporated in each Cooperating State's stewardship agreement with the Federal Highway Administration, and

WHEREAS standardized performance measures for assets and business processes are promoted by the American Association of State Highway and Transportation Officials; and

WHEREAS national performance standards are being considered by the United States Congress in discussions on the future Transportation Bill, and

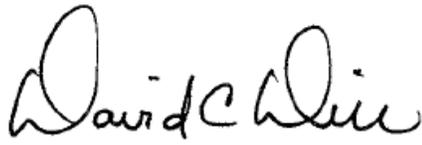
WHEREAS standardized performance measures among the Cooperating States will assist in Communications with respective stakeholders and legislative bodies, and

WHEREAS the Cooperating States have similar size departments, programs, and transportation systems.

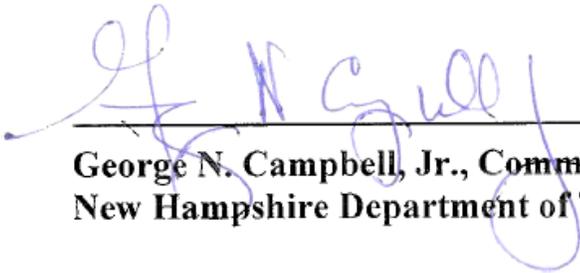
NOW THEREFORE BE IT UNDERSTOOD THAT the Cooperating States pledge to work cooperatively to develop standardized performance measures for assets and business processes. The near term objective is to roll out 3 to 6 standardized performance measures for assets as well as business processes by January 1, 2011 and report on them on at least a quarterly basis thereafter

BE IT FURTHER UNDERSTOOD THAT the Cooperating States will continue to seek further standards in the coming years, will work with respective FHWA counterparts to incorporate standard measures in the stewardship agreements where appropriate, and will be active in AASHTO to ensure these standard measures are considered for adoption on the national level

IN WITNESS WHEREOF, the parties hereunder have set their hands on the day and year as first above written.



**David C. Dill, Secretary
Vermont Agency of Transportation**



**George N. Campbell, Jr., Commissioner
New Hampshire Department of Transportation**



**David Cole, Commissioner
Maine Department of Transportation**

