

Transportation Asset Management Plans

Case Study 6 - Communicating Asset Management Strategies

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Table of Contents

Case Study Introduction.....	1
Communicating and Coordinating with Partners	2
Vermont Agency of Transportation’s Use of the TAMP as a Communication Tool.....	2
Improving Internal Communication.....	3
VTrans Communication Plan.....	4
Caltrans Asset Management Spurs State/Local Coordination.....	5
New Jersey DOT’s Coordination with Other NHS Owners	6
Washington DOT’s Coordination with Local Asset Owners	8
Communicating with Legislators and a Commission	9
Michigan DOT’s Communication and Coordination Highlights	9
Ohio DOT’s Data Collection and Sharing.....	10
Ohio DOT’s Stakeholder Communication Plan	11
Colorado DOT Providing Data to Locals and MPOs	11
Nebraska DOT’s Communication with Legislators and MPOs	12

Case Study Introduction

This case study is one of seven that captures good asset management practices documented in the 2019 transportation asset management plans (TAMPs) required by 23 U.S.C. 119(e). The TAMPs include a wealth of information about the asset management practices deployed by State departments of transportation (DOTs). The asset management plan framework that the Federal Highway Administration (FHWA) describes in 23 CFR Part 515 provided the structure to document how these practices are applied. This series distills many of the good practices and presents them in a convenient format for use by other transportation agencies.

The seven case studies are:

Case Study 1: Asset Management Practices and Benefits

Many of the TAMPs provided comprehensive summaries of their asset management practices and the benefits they received from them. Several examples are highlighted in this case study. These include examples from the DOTs in New Jersey, Pennsylvania, Illinois, and Washington State. These examples illustrate how asset management plans can effectively summarize asset management processes and improvement strategies.

Case Study 2: Linking Asset Management to Planning and Programming

This case study examines how TAMPs documented linkages to the DOT's long-range plan, the State Transportation Improvement Program (STIP), and state planning and programming practices. Examples are selected from the TAMPs in Missouri, Maine, Utah, Ohio, Wyoming, and Montana.

Case Study 3: Supporting Life-Cycle Planning

To develop a life cycle plan, one needs to know how assets deteriorate throughout their life cycle. Several TAMPs were notable in documenting how they manage assets with life cycle plans. Included in this case study are examples from the DOTs in Minnesota, Ohio, Tennessee, and New Jersey.

Case Study 4: Managing Risks to Assets

DOTs embrace risk management to support the long-term performance of assets, and for making risk-based investment tradeoffs. This case study summarizes some of the good risk management practices from Washington State, California, Kansas, South Dakota, Louisiana, Rhode Island, Pennsylvania, Texas, Colorado, and Michigan.

Case Study 5: Developing Financial Plans and Investment Strategies

The financial plans and investment strategies reflect priorities for allocating scarce resources to achieve their highest asset management objectives. This case study examines how several TAMPs described the clear linkages between their asset management objectives, gaps, risks, and investment strategies. Examples are from Kentucky, Michigan, Washington State, New York State, Utah, Vermont, and Illinois.

Case Study 6: Communicating Asset Management Strategies

This case study summarizes examples of communicating asset management strategies with key internal and external stakeholders. Examples are cited from the DOTs in Vermont, California, New Jersey, Washington State, Michigan, Ohio, Colorado, and Nebraska.

Case Study 7: Managing Non-Bridge-and-Pavement Assets

Several State TAMPs included additional assets beyond pavements and bridges. Examples are cited from Minnesota, Connecticut, Utah, and California.

This is the sixth case study in the series. It summarizes TAMP examples of communicating asset management strategies with key internal and external stakeholders. Examples from the DOTs in Vermont, Michigan, Washington State, Ohio, California, Colorado, New Jersey, and Nebraska are included in this study.

Communicating and Coordinating with Partners

The 2019 transportation asset management plans demonstrated the importance of communicating and engaging with stakeholders to promote the long-term management of transportation assets. Some of the States' engagement was with local owners of the National Highway System (NHS) who manage nearly 12 percent of the NHS.¹ Other engagement was with legislators or the agencies' commission. Still other engagement was with the numerous internal stakeholders.

This case study documents some of the good practice examples of engaging with stakeholders to manage assets. These case studies summarize only a few of the engagement efforts seen in the 2019 transportation asset management plans.

Vermont Agency of Transportation's Use of the TAMP as a Communication Tool

The Vermont Agency of Transportation (VTrans) emphasized the asset management plan's role as a vehicle to communicate with its internal and external stakeholders. The 2019 TAMP included numerous references to the plan's role as a communication medium, an internal coordination tool, and as a repository of institutional knowledge and policy.

The TAMP listed as one of asset management's main benefits the ability to integrate efforts across the department and communicate how that integration sustains the transportation system.

Among the communication strategies was the adoption of a formal asset management policy. The policy communicated to internal and external stakeholders VTrans' four main asset management objectives, which were to:

- Meet the minimum Federal and State legislative requirements regarding asset management implementation.
- Develop factual, risk-based, and data-driven asset management procedures.
- Use asset management to manage the Agency's physical infrastructure, drive the budget development procedures, and support the Agency's Strategic Plan.
- Integrate asset management principles into VTrans culture.

One strategy to communicate the importance of asset management and integrate it across the many VTrans departments was the formation of a broad working group. The participants were called asset management stewards and represented areas including finance and accounting, budgeting and programming, materials, geotechnical, information technology, maintenance, right of way, bridges and culverts, planning, pavement management, traffic operations, bridge management, risk management, and asset management. This group developed the Asset Management Policy Statement, supported the current TAMP efforts, and continued to guide asset management implementation.

The working group guided development of three products to maximize the benefits of asset management.

1. A brochure entitled, “Why Should We Care About Roads” – The key audience for this brochure was legislators, regional planning commissions (RPCs), RPC Transportation Advisory Committee (TAC) members, municipal officials and board members, and everyone who will help make decisions that affect transportation assets. The TAMP stated that a brief, visually interesting brochure was the appropriate format to engage people in reading about this technical topic.
2. The TAMP – The plan said the key audience for the plan was professionals whose work intersects with transportation asset management. The TAMP stated that people whose work contributes to, or is guided by, asset management can do a better job if they understand how the pieces fit together. The plan also explained how VTrans is meeting FHWA requirements. The TAMP stated it is essential that the plan be clear and relatively brief for a range of VTrans staff and other partners to read it and implement it.
3. The VTrans Asset Management Practitioners’ Guide – The TAMP stated that this is a more in-depth supplemental document for a smaller, more technical audience of transportation professionals conducting asset management and includes assets that are not yet part of the TAMP. This guide also represented VTrans’ enhanced efforts to document institutional knowledge and procedures as staff members change positions or retire.

The TAMP stated that as VTrans discusses asset management in increasingly diverse settings, it needs brief, clear communication pieces.

The TAMP discussed its linkage to the agency’s project-prioritization procedures called the Vermont Project Selection and Prioritization Process (VPSP2) which not only prioritizes projects but also provides a transparent scoring procedure to communicate why some projects are selected and others are not. VPSP2 communicates the value that projects provide using eight criteria: safety, asset condition, mobility/connectivity, economic access, resiliency, environment, health access, and regional priority.

Another tool to share information and data is the Vermont Asset Management Information System (VAMIS), which is intended to also be accessible to local agencies. The TAMP stated that VAMIS will support the analysis of different investment scenarios across multiple asset types. VAMIS is a collection of hardware, software, data, and procedures that support asset management business activities. It will gather data from various sources, store, and analyze them. It will be used for budget and planning to implement maintenance, rehabilitation and replacement strategies and to schedule, track, and manage work. VAMIS was anticipated to be available online in 2020. The TAMP indicated that statewide entities have expressed interest in using VAMIS to manage their assets.

Improving Internal Communication

The VTrans plan also focused on internal communication bottlenecks and identified procedures to improve them. One was the prompt communication of bridge maintenance needs once an inspection is completed. Typically, the inspector would inform the district maintenance staff about a maintenance need. However, if the district did not have the staff or resources to address the need, it went unaddressed. At times, non-emergency bridges have gone onto a long list subject to funding and staffing. The TAMP stated that districts while operating under these constraints sometimes make reactive maintenance decisions that are not consistent with the most effective long-term life-cycle strategy. The loop of communication did not consistently get closed promptly.

To address this issue, the TAMP indicated the bridge inspection team will enter bridge findings into VAMIS. That will automate the procedure to generate a work order, which will streamline the activity and facilitate the communication of the issue in a timely manner. The TAMP stated that automating the workflow will reduce delays, add accountability, and allow the repair cost to be linked to the correct expenditure account. Work will be defined as Emergency, Urgent, Critical, Maintenance Finding, or Cyclical Activity. Each definition has a specific time frame within which the deficiency must be corrected.

The TAMP stated that another communication strategy will be the Practitioners' Guide to document and hand down institutional knowledge as pavement management staff turnover. The 2019 TAMP indicated VTrans has lost over 150 years of pavement management experience in the past two years, and little of this knowledge was transferred in a proactive manner.

The TAMP Practitioners' Guide for asset stewards and managers is under development and when released across VTrans is intended to develop a common level of understanding and support knowledge transfer. In 2014, VTrans established a Pavement Working Group and a Structures Working Group. The TAMP indicated that benefits of these teams include the interactions between asset subject matter experts (SMEs) that share institutional knowledge. The meeting minutes provide written history of each group's activities. The TAMP stated that an oversight team that includes Division and Bureau Directors is being considered. This oversight team is expected to provide tasks to the working groups. A deliverable from each working group will be defined roles and improved procedures for asset management across the agency. Another deliverable will be to understand how the agency will select and deliver the next generation of employees who will commit themselves to managing Vermont's pavements and bridges.

The TAMP stated that coordinating procedures within VTrans is intended to build horizontal alignment to complement the vertical alignment described in life-cycle planning. This will integrate performance and risk considerations into data-driven decisions while creating awareness as to the impact of those decisions on business procedures, goals, and objectives, and on VTrans' customers. The TAMP started with an effort to improve coordination among the long-range transportation plan, strategic plan, and State Transportation Improvement Program (STIP). Even before the initial TAMP was completed, VTrans saw improvement in coordination of contents and visual communication, such as STIP and strategic plan report covers that display the relationship of each of these related plans. The long-range transportation plan (LRTP) and strategic plan coordinate with the TAMP, and all these efforts build on a foundation of risk management and performance management.

The TAMP also stated that ongoing commitment to communication, outreach, training, and education were essential. Some techniques VTrans will use are:

- Ongoing trainings on life-cycle planning, risk management, financial planning, asset management, and performance planning to build knowledge and engagement.
- Two-way communication with users of the transportation system and partners, such as through participating in outside meetings, and sharing survey results.
- Education efforts, both traditional and cutting edge, so that everyone interested in asset management has the knowledge to participate in decision-making at an appropriate level.

VTrans Communication Plan

Among the items in the 2019 VTrans TAMP was a communication plan, which included the brochure, the TAMP itself, a one-page fact sheet on asset conditions, fact sheets about individual assets, and the practitioners' guide.

As of April 2019, hundreds of copies of the TAMP brochure had been requested by legislators and by the metropolitan planning organizations (MPOs) and RPCs. Copies of the TAMP or a shortened version of it were to be distributed widely within VTrans as part of an education effort. A key audience was the staff members whose work intersects asset management, but who had not been directly involved. The TAMP stated that the effort to explain why each person's work matters and how collective efforts fit together has asset management benefits for the overall VTrans organization.

VTrans spent considerable effort on the Practitioners' Guide. Highlights include having short informational "pull-outs" that provide key asset information or individual asset management plans. These plans can be used by asset stewards to provide background asset information quickly and efficiently to a diverse audience. The Practitioners' Guide will document VTrans' efforts, support continuous improvement, and capture institutional knowledge.

Caltrans Asset Management Spurs State/Local Coordination

The California Department of Transportation (Caltrans) faced the asset management challenge of coordinating with the owners of 19,427 lane miles of the locally owned NHS. Caltrans has by far the greatest number and highest percentage of locally owned NHS assets of any State with 34.6 percent of NHS lane miles locally owned. In fact, the Southern California Association of Governments (SCAG) manages 11,658 NHS lane miles which is more mileage than that managed by several small States combined.^{2,3} Caltrans manages 9,196 NHS bridges while the locals manage 1,629 NHS bridges, a slightly greater amount than the State-maintained NHS bridges in Minnesota.⁴

The 2019 Caltrans TAMP stated the result of the asset management plan coordination was to increase collaboration with the local NHS owners. Caltrans hosted several workshops with local NHS owners, which led to increased understanding among the agency, local NHS owners, and regional transportation agencies. The TAMP process also spurred establishment of a Transportation Asset Management Advisory Committee (TAMAC) that included Caltrans and local NHS stakeholders.

The Caltrans TAMP addressed two overlapping highway systems, the State Highway System (SHS) and the NHS. The SHS is managed by Caltrans but the NHS is managed by Caltrans and cities and counties, toll authorities, tribal governments, and Federal agencies.

Among the issues that Caltrans and the local partners discussed was how to reconcile different pavement performance measures, estimate local investments on the NHS that were not tracked by local partners, and create local awareness of the TAMP.

Caltrans collects pavement inventory and condition data for all NHS and SHS pavements through an automated survey procedure. Although Caltrans reports data to the Highway Performance Management System (HPMS) based on the Federal measures, the local jurisdictions tend to use the Pavement Condition Index (PCI) measure. Analysis of locally managed NHS pavements indicated that because of International Roughness Index (IRI) values, few locally managed NHS pavements will be rated as Good per the Federal performance measures.

The Caltrans TAMP stated that several strategies will need to be pursued by local, regional, and State partners to close the performance gaps for locally owned NHS pavements and bridges. Additional funding from a recent State revenue increase would need to be reallocated by local partners to the NHS assets. Or, the local owners could re-prioritize their local funds to emphasize NHS conditions. Also, better informed investment decisions are possible through improved coordination and information

sharing among local, regional, and State partners. For the portion of the NHS owned by local agencies, revenues are derived from a variety of sources, including Federal and State sources, as well as additional local funding sources, such as local sales taxes, development impact fees, property taxes, and traffic impact fees. However, the local funds must support all local roads, not only the locally owned NHS.

Developing the TAMP identified areas of weakness and many opportunities to strengthen investment decisions in the future. The TAMP stated an effort to make progress on data improvements and tool availability to support TAM will be initiated. This effort was intended to prioritize and sequence the set of data and tool-improvement actions. It will also identify the coordination needed to ensure that the data will be aligned across assets and jurisdictions. The TAMP indicated among the data needs raised by local stakeholders was the need for consistent data about local conditions, systems, and assets, common terminology, and procedures to ensure data quality and accuracy.

Another identified need was better coordination of local, regional, and State decision-making about assets. At the State/local TAMP workshops, participants saw this as an opportunity to deliver a better transportation experience to California's travelers. Stakeholders also identified the need to continue to improve the understanding of pavement and bridge assets and the need to better understand other asset classes as they are included in the TAMP. The first set of additional assets was to be drainage and TMS assets. Many other assets were planned to be included in the upcoming years. Among the modeling needs identified by participants were the need for climate change projections, life cycle planning information, and improved deterioration models.

Another area identified in the State/local collaboration was the need for improved understanding of how transportation assets support other objectives such as safety, mobility, economic development, social equity, sustainability, and environmental mitigation. Stakeholders suggested the need for performance measures that help understand the relationship between assets and these other objectives. They also suggested gathering information about how asset management supports these other objectives, and prioritizing areas where asset management will have the greatest impact on those objectives.

Another suggestion was to emphasize corridor management to further engage local owners with the State, and to encourage support of Federal objectives. The TAMP stated that viewing local assets as part of a larger corridor can encourage broader thinking about inter-agency cooperation. The TAMP stated that moving forward with this priority, Caltrans will first look at existing corridor planning and management procedures and explore how these can be enhanced with the addition of asset needs. Other activities will look at identification of other corridors based on travel volume and asset needs.

The stakeholders involved in the Caltrans TAMP development process recognized the value and importance of better communicating asset management needs and accomplishments. Ideas included the sharing of data, sharing of success stories, and providing templates for communication with the media.

New Jersey DOT's Coordination with Other NHS Owners

For its 2018 and 2019 plans, the New Jersey Department of Transportation (NJDOT) developed protocols to coordinate with the 83 agencies that manage sections of the locally owned NHS. Those agencies include turnpikes, a port authority, cities, and counties, each with its own priorities and revenues. Through the TAMP-development process, NJDOT developed procedures by which the management of the NHS could be coordinated and its conditions forecasted.

New Jersey has 12,233 lane miles of NHS. The NJDOT maintains 61 percent of the NHS lane miles, with the New Jersey Turnpike Authority managing 19 percent, other authorities managing 4 percent, and cities and counties managing the remaining 16 percent. The State has 61,396,535 square feet of NHS bridge deck area of which NJDOT manages less than half, 47 percent. The turnpike authority manages 34 percent, the port authority 17 percent, and cities and counties manage 2 percent.

The NJDOT plan stated that the agency developed an extensive communication and consultation program involving all 83 non-DOT NHS asset owners and the three New Jersey MPOs. The TAMP communications program informed and educated those parties about the purpose and scope of the TAMP and encouraged their participation during the TAMP development. The communications program was designed to enable NHS owners to become informed, provide data, review the TAMP, and participate in target setting.

The broad aims of the outreach were to:

Communicate Asset Management Purpose, Objectives, and Requirements – To enable meaningful input, communications and involvement included providing an overview of the TAMP, its purpose, objectives, and requirements, as well as the TAMP process and the role of non-NJDOT owners in the process.

Establish Ongoing Communications with NHS Owners – In the TAMP development process, non-NJDOT NHS owners were invited to participate in all stakeholder meetings, coordinate and manage the data requests, review and validate technical analysis, and provide comments.

Ensure Direct Engagement – The TAMP Team communicated plan processes and updates on the TAMP development to all stakeholders. Correspondence provided information on the development progress and how the stakeholders fit in.

Ensure Quality Data – The TAMP Team directly enlisted the support of the three MPOs to assist NJDOT during the TAMP communication process. Specifically, the MPOs assisted in the collection of data and information from the various jurisdictions for NHS assets.

The NJDOT collected data from non-DOT NHS owners regarding their asset inventory and their planned expenditures on NHS assets. Local owners also were asked to confirm the accuracy of data about their assets and to document their past project work, planned expenditures, and their forecasted trends for NHS assets.

Despite the ownership spread across 83 agencies each with its own procedures, the information collected from the other stakeholders allowed NJDOT to forecast statewide trends. One trend was that non-NJDOT NHS bridges will remain in their current network condition, which is less than 2 percent in Poor condition. Another is that the Interstate and non-Interstate NHS pavements will also surpass the target with less than 1 percent of the Interstate pavement forecasted to be Poor by 2029.

Information about NHS investments from the turnpike and port authority were available through those agencies' capital planning procedures. The NJDOT made its best effort to obtain local NHS investment data by conducting a survey of local NHS owners. A survey collected data for 90 percent of the assets managed by the cities and counties. The results provided lane-mile estimates of how much the cities and counties invested both in recent years and through 2022. With those estimates, the NJDOT extrapolated expected expenditures through 2029. Those investment levels were included in the forecasts that projected future NHS bridge and pavement conditions.

The large amount of local NHS ownership not only influenced condition forecasting and financial planning; it also influenced the management of risks. Several risks related to the dispersed ownership of assets were included in the agency's risk register:

- If other jurisdictions do not implement the asset management processes, then condition targets will not be met.
- If NJDOT cannot collect accurate data about local investments, then it will hinder its ability to make good decisions about goals, performance measures, targets, and prioritization.
- If there is no systematic prioritization process for the NHS, then NJDOT cannot achieve its targets.
- If NJDOT does not establish a data-sharing process with other asset owners, then it will reduce the awareness and communication of issues between departments, stakeholders, and the public.
- If NJDOT lacks a system to track programming for NHS roadways that are operated by other agencies, then NJDOT cannot meet its reporting requirements.

Washington DOT's Coordination with Local Asset Owners

The Washington State DOT TAMP indicated that one of the risks facing the state of good repair was the large amount of locally owned NHS assets. The 2019 TAMP stated that locals owned 31 percent of the non-Interstate NHS. With such a high percentage of local ownership, how funding was allocated for bridge and pavement preservation on those local NHS routes had a significant impact.

Since the 2018 initial plan identified local NHS ownership as an issue, WSDOT in partnership with the MPOs has begun addressing the issue. One example of this was the local engagement plan. Through this process, WSDOT estimated the average annual pavement needs based on lowest life-cycle cost strategies and intended to make pavement condition and needs information available geospatially.

WSDOT has begun the planning process to address the following areas:

- Evaluate and identify average annual bridge needs on the locally owned sections of the NHS.
- Work with MPOs to determine ways of reasonably estimating future NHS investment levels for bridge and pavement assets.
- Align local investment activity types to FHWA investment activity types to review general investment strategies on the local NHS and to address the Federally required annual consistency review.
- Align planned level of expenditures to funding needs and identify funding gaps.

Another issue related to risks surrounding the local NHS was that 32 percent of the non-Interstate NHS pavement data was submitted to the HPMS as incomplete because the local data did not have all the pavement performance measure attributes.

The WSDOT plan noted that 103 local agencies own some portion of the NHS. WSDOT had been actively working with the MPOs and local agencies to implement pavement performance measures, and established a Pavement Technical Committee with representatives from MPOs and local agencies to implement pavement performance targets.

WSDOT's TAMP outlined a six-step plan to extend a comprehensive State process to locally owned NHS pavements, and to provide guidance to the MPOs on pavement management best practices. The six steps to address the locally owned NHS pavements include:

1. Improve and extend data collected and stored in the HPMS.
2. Perform analysis on locally owned NHS pavement data to include an estimate of service life and life cycle planning analysis.
3. Develop local agency NHS pavement funding needs based on life cycle planning results.
4. Develop investment strategies based on available funding and needs.
5. Document and communicate results along with any guidance on best practices.
6. Identify local agency top value pavement projects that reflect investment strategies.

The plan stated that WSDOT's local programs office will work with local agencies to identify and vet projects. These projects will be communicated to the MPO technical committees for the "call for projects" funding process. The list of projects also can be used to reassess overall needs and make assumptions about the future condition of the NHS.

Communicating with Legislators and a Commission

The WSDOT plan also gave the agency the opportunity to document how its asset management practices fulfill legislative recommendations for how the agency should manage assets. The 2019 WSDOT plan refers to a 2014 legislative assessment of how the department incorporates risk and life cycle planning into its bridge and pavement management. The assessment found that WSDOT was exceptional compared to other States in how it managed risks. The TAMP confirmed that those practices remain in place, as recommended by the assessment. The TAMP also confirmed that WSDOT continued to deploy the good practices for life cycle planning that were examined in the assessment.

The 2014 assessment found that WSDOT was not fully analyzing bridge deterioration rates and life cycle investments. The 2019 TAMP noted the progress made in that area and noted that WSDOT was developing guidance on more strategic management of bridges, and it was adopting a bridge management system to improve deterioration forecasting and life cycle planning.

The 2019 TAMP identified the progress made since 2014 including increasing preventive maintenance, evaluating additional resurfacing techniques, and capturing maintenance treatments to improve life cycle planning analysis.

Michigan DOT's Communication and Coordination Highlights

Michigan DOT (MDOT) has a history of successfully supporting the management of local transportation assets. This history of asset management and performance measurement helped pave the way for the development of the State's 2019 TAMP, which in turn further advanced ongoing asset management efforts.

Since 2002, the Michigan Transportation Asset Management Council (TAMC) has developed statewide asset management strategies, procedures, and tools to support local governments' adoption of asset management on Federal-aid highways. Working from MDOT's example, the group developed tools that local agencies could use, as well as a methodology that all agencies could agree on for data collection and analysis. As a result, several hundred road agencies work together each year through their regional planning agencies and MPOs to gather performance data on almost 37,000 miles of Federal-aid highway pavements and more than 11,000 highway bridges.

Of the 84 Michigan road agencies with jurisdiction over the NHS, more than 60 percent use asset management procedures to select projects. More than 50 percent of these road agencies use software or other tools to prioritize projects and have a separate investment plan for their higher-level system, including the NHS.

Moving forward, there is a new State requirement that local agencies in Michigan with at least 100 route miles must prepare and manage their respective systems through an approved asset management plan. This effort will augment previously established undertakings.

The TAMP development process initiated another advance in the long-standing cooperation between MDOT and local asset owners. MDOT has managed its pavements using a remaining service life (RSL) metric for more than 20 years. However, the RSL metrics were not generated for locally controlled routes, including the 18 percent of the NHS that is locally controlled. For these routes, local governments used a pavement rating system based upon visual inspection, not the automated inspection required for performance reporting.⁵ To prepare for the Federal pavement performance measurement rule, MDOT began collecting data for all the new pavement metrics on the State's entire NHS in 2016. This included data collection on the non-Interstate NHS routes which are under local government jurisdiction.

Using these data, MDOT provided each MPO with a "report card" for pavement condition on the Interstate and non-Interstate NHS in their areas that conveyed how this condition compared to the statewide condition. A similar effort occurred using the bridge target-setting data. These efforts reduced the burden of data collection and analysis on MPOs and ensured that they all had consistently measured and analyzed data.

MDOT and MPOs used these historical data to establish statewide targets and to understand which target option was appropriate for each MPO, whether it was to support the statewide targets or to establish their own.

Ohio DOT's Data Collection and Sharing

The 2019 Ohio Department of Transportation (ODOT) asset management plan provided additional examples of how a TAMP can spur communication and coordination.

The Ohio DOT collects all bridge and pavement condition data on the entire NHS and provides them to local NHS owners and MPOs to support their investment decision making. ODOT collects the following:

- Automated profiler ride quality data including IRI, rutting, cracking, and faulting on all NHS sections including the Ohio Turnpike
- Manual Pavement Condition Rating (PCR) data on all NHS and Federal-aid routes, including the Ohio Turnpike
- General appraisal ratings for all conduits on the State system

ODOT also oversees all bridge inspections and ratings on the entire State system, including the NHS. NHS conduits that are not on the State system are managed by its local partners and submitted to ODOT. The TAMP stated ODOT was developing processes to improve the collection of data on locally maintained NHS conduits to assist in future reporting.

To coordinate these activities, ODOT made the data available through its Transportation Information Mapping System (TIMS), which is a public facing geographic information system (GIS) data portal that allows customers to view, consume, and distribute data. In addition, ODOT created an online Transportation Asset Management Decision Support Tool (TAMDST) that gives ODOT decision makers

access to data to support better business decisions. ODOT also utilized its Local Transportation Assistance Program (LTAP) to train partners on a host of topics, including how to use the asset management data. In 2017 alone, LTAP trained over 15,000 local transportation professionals on a variety of topics related to managing Ohio's infrastructure.

ODOT will continue to coordinate activities by working closely with the Ohio Association of Regional Councils (OARC) which represents 1,500 municipalities, villages, townships, counties and MPOs within the State.

Ohio DOT's Stakeholder Communication Plan

The Ohio DOT also developed a communication plan to engage employees and partners such as the MPOs and local governments. The plan included two videos describing ODOT's asset preservation strategy, a web page for downloading information, a PowerPoint presentation that can be shared with stakeholders, and a Fact Card that summarizes key points. The communication plan focused on three strategies:

- Using state-of-the art technology for better decision-making, including the use of computerized management systems that objectively predict asset needs.
- Aggressively applying asset preservation treatments to get out in front of problems before they occur.
- Improving collaboration in the way ODOT manages its assets that results in better, timelier decisions and more consistency across Districts.

Finally, ODOT holds monthly meetings for its Asset Management Leadership Team and District Asset Management Coordinators.

Colorado DOT Providing Data to Locals and MPOs

To encourage the integration of asset management planning with the transportation planning process, the 2019 Colorado Department of Transportation (CDOT) TAMP included data on the number and condition of NHS bridges in the planning areas of the State's five MPOs. The 2019 TAMP enumerated the number of NHS bridges in each MPO area, the percentage that are Good, Fair, and Poor as well as the square feet in each condition.

The TAMP stated that CDOT will continue working with the MPOs to develop a coordinated data-sharing process and to ensure there is agreement on responsibilities. Since early 2018, CDOT has provided historical data on the FHWA-required measures and targets to help MPOs understand current performance under the new metrics, especially for bridges and pavement. CDOT maintained the most comprehensive data on these assets because it collects pavement and bridge condition data for the full NHS.

In addition, the Department in the spring of 2019 collaborated with the cities of Denver and Colorado Springs to understand their future investments in NHS pavement and bridges. CDOT intended to integrate such spending information into analyses it developed for forecasting performance.

In Colorado, the DOT managed 87 percent of the NHS lane miles with 13 percent managed by local agencies. CDOT also owned 88 percent of the NHS bridges, with 12 percent locally owned.

Nebraska DOT's Communication with Legislators and MPOs

The Nebraska Department of Transportation (NDOT) 2019 asset management plan complemented a needs assessment report for the Nebraska State Legislature that communicated the cost to eliminate geometric deficiencies, address capacity, and achieve the State's pavement condition targets. The 20-year analysis also identified funding gaps. The TAMP augmented that long-standing report with additional detail on the life-cycle strategies, risks, and investment strategies to manage the NHS.

The needs assessment was enhanced with a ten-year candidate list of pavement projects provided to each district. The candidate lists were generated by the agency's pavement management system that recommended treatments as part of a 10-year life-cycle-based planning forecast. The analysis prioritized projects by identifying the life-cycle improvement strategy, timing, and cost for each pavement section. From the list, the districts and program management division developed the pavement program.

Similar project candidate lists were provided to the MPOs as a tool to help them develop their individual four-year transportation improvement programs (TIPs). To coordinate with the MPOs' long-range plans, NDOT also provided the State's two MPOs with 10-year lists of NHS bridge and pavement projects so the planning agencies could incorporate them into their long-range plans.

¹ FHWA Highway Statistics, Table HM 40 National Highway System Road Length – 2017, Miles by Ownership.

² California Department of Transportation, 2019 Transportation Asset Management Plan, p2-25.

³ Federal Highway Administration, Table HM-40 National Highway System Road Length – 2017, Miles by Ownership.

⁴ Minnesota Department of Transportation, 2019 Transportation Asset Management Plan, p54.

⁵ 23 C.F.R 490.309 (b)(E)(3)