

## FHWA PAVEMENT MANAGEMENT DRAFT BASELINE SURVEY

### Introduction

As a pavement management practitioner, you are being asked to complete this customer satisfaction survey to help the Federal Highway Administration (FHWA) gauge satisfaction with FHWA’s pavement management support, and identify interest areas as its Pavement Management Roadmap<sup>1</sup> is updated. The last version of the Roadmap, which helped establish prior research and technology transfer needs, was developed 10 years ago and there have been many changes in practice since that time. Your responses will help define the current state of practice and serve as an important first step in identifying areas that would benefit from additional research, guidance, or technology transfer activities.

This survey is being distributed to the Pavement Management Engineer at each of the State Departments of Transportation (DOT) as well as local agency practitioners representing cities, counties, and regional agencies. It is estimated that the survey takes approximately 20 minutes to complete.

### Instructions

Please complete the survey within 2 weeks after receipt. If you have any problems related to this survey, please contact Katie Zimmerman at [kzimmerman@appliedpavement.com](mailto:kzimmerman@appliedpavement.com). Thank you for your feedback!

### Questionnaire Tips

1. To view and print an entire blank questionnaire, [click here](#). Use the keyboard shortcut “CTRL+P” to print.
2. If you are completing the questionnaire over several days, or to send a partially-completed questionnaire to a colleague, click on the “save and continue” button at any time for an edit link to be sent to your email, which you can use to either return to where you left off or to forward to your colleague.
3. To ensure that your responses are saved prior to submission, advance to the next page before exiting the survey.
4. To navigate through this questionnaire, use the “Back” or “Next” buttons at the bottom of each page.
5. To review and print your answers prior to submittal, advance to the last page of the survey. Print using “control p.”
6. To submit the survey, click the “Submit” button on the last page.

### Survey Questions

Select the best response from the options provided for each question. Optional comment boxes are provided throughout the survey so you can provide additional feedback to FHWA.

The questions are organized into the following categories:

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<sup>1</sup> <https://www.fhwa.dot.gov/pavement/management/roadmap/>

- Section 1: General –to obtain foundational information about your agency.
- Section 2: Pavement Management Resources –to learn more about the references your agency has used to support pavement management and areas needing additional guidance or training.
- Section 3: Pavement Management Practices –to establish a baseline summary of current pavement management practices and to assess additional needs in these areas. This topic includes questions related to pavement data collection/quality management, performance management/target setting, and analysis/project selection/reporting.
- Section 4: Pavement Management Uses –to learn the extent to which pavement management information is used to support agency-wide activities and areas that might benefit from addition assistance.
- Section 5: Opportunities –to identify gaps that could be addressed through research, guidance, training, or other strategies.

## Section 1. General Questions

These questions ask for foundational information about your agency.

1. I represent the following type of agency.
  - a. State DOT
  - b. City
  - c. County
  - d. Regional planning organization
  - e. Other
2. We have a computerized pavement management system in place.
  - a. Yes
    - i. If yes, indicate the degree to which your system capabilities satisfy the minimum requirements identified in 23 CFR 515.17<sup>2</sup> that apply only to NHS pavements (For example, these requirements include inventory and condition data, forecasting deterioration, determining the benefit/cost over an asset life cycle, identifying short- and long-term budget needs, determining improvement strategies that maximize benefits within funding constraints, and recommending improvement programs)
      1. Yes, in full
      2. Yes, in part

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<sup>2</sup> <https://www.govinfo.gov/content/pkg/CFR-2017-title23-vol1/xml/CFR-2017-title23-vol1-part515.xml>

- 3. No
  - 4. I'm not sure
- b. No
  - c. We are in the process of implementing a system
3. Our pavement management system performance models and treatment rules are documented in a manual, handbook, guide or other similar reference.
- a. Yes
  - b. No
  - c. We are in the process of documenting our system
  - d. We intend to document our system soon

## Section 2. Pavement Management Resources

These questions assess the usefulness of available references to support your pavement management efforts.

4. The following references, guides, and technology transfer materials have been useful to my agency in supporting our pavement management practices. (Select all that apply) (Images of FHWA report covers will be inserted in the online version if easily adaptable.)
- Federal regulations/requirements for pavement management data collection<sup>3</sup>.
  - The *Pavement Management Guide* published by the American Association of State Highway and Transportation Officials (AASHTO).
  - National training on pavement management.
  - Local training on pavement management.
  - FHWA *Practical Guide for Quality Management of Pavement Condition Data Collection*<sup>4</sup>.
  - FHWA *Guidelines for Data Quality Management Plans*<sup>5</sup>
  - Our agency's *Data Quality Management Plan*
  - FHWA *Distress Identification Manual for the Long-Term Pavement Performance (LTPP) Program*<sup>6</sup>
  - FHWA *Highway Performance Management System (HPMS) Field Manual*<sup>7</sup>
  - Federal Transportation Performance Management (TPM)<sup>8</sup> guidance/regulations/requirements
  - Federal Transportation Asset Management<sup>9</sup> guidance/regulations/requirements
  - Other \_\_\_\_\_
5. Our pavement management staff would benefit from additional guidance and/or training in the following areas. (Select all that apply)

Topics related to:

- Pavement data collection, such as: \_\_\_\_\_

<sup>3</sup> <https://www.fhwa.dot.gov/tpm/videos/docs/National%20Infrastructure%20Condition%20Performance%20Measures.pdf>

<sup>4</sup> [https://www.fhwa.dot.gov/pavement/management/qm/data\\_qm\\_guide.pdf](https://www.fhwa.dot.gov/pavement/management/qm/data_qm_guide.pdf)

<sup>5</sup> <https://www.fhwa.dot.gov/pavement/management/pubs/dqmp.pdf>

<sup>6</sup> <https://www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltp/13092/13092.pdf>

<sup>7</sup> <https://www.fhwa.dot.gov/policyinformation/hpms/fieldmanual/>

<sup>8</sup> <https://www.fhwa.dot.gov/tpm/policy/index.cfm>

<sup>9</sup> <https://www.fhwa.dot.gov/asset/guidance.cfm>

- Pavement distress ratings, such as: \_\_\_\_\_
- Equipment calibration and certification, such as: \_\_\_\_\_
- Certification of pavement data collection personnel, such as: \_\_\_\_\_
- Pavement data quality control measures, such as: \_\_\_\_\_
- Data sampling, review, and checking processes, such as: \_\_\_\_\_
- Error resolution, such as: \_\_\_\_\_
- Data management, such as: \_\_\_\_\_
- Other pavement data-related topics, such as: \_\_\_\_\_
- Pavement target setting, such as: \_\_\_\_\_
- Pavement data analysis, such as: \_\_\_\_\_
- Pavement performance modeling, such as: \_\_\_\_\_
- Pavement treatment (e.g. maintenance, preservation, or rehabilitation activities) performance, such as: \_\_\_\_\_
- Project and treatment (e.g., maintenance, preservation, or rehabilitation activities) selection, such as: \_\_\_\_\_
- Communicating pavement management results, such as: \_\_\_\_\_
- Risk management, such as: \_\_\_\_\_
- Use of pavement management to calibrate design models, as in AASHTOWare Pavement ME Design
- Other: \_\_\_\_\_

### Section 3. Pavement Management Practices

Your answers to the questions about your pavement management practices will be used to determine gaps between current and desired practices and satisfaction with FHWA support that could be addressed through additional assistance. This section includes questions in three areas: 3.1 - Pavement data collection/quality management, 3.2 - Performance management/target setting, and 3.3 - Analysis/project selection/reporting.

#### 3.1 Data Collection and Quality Management

6. Using the first three columns in the following table, identify each of the types of pavement condition information that your agency collects on a network-wide basis (as opposed to specific project locations). If you do not collect the information on a network-wide basis, please put an “X” in the first column. If you collect the information, use the shaded columns to identify whether it is collected using inhouse staff (By Agency) or by a vendor (By Vendor). The last column allows you to identify topics on which you would like additional guidance or training. The comments allow you to explain any of your responses.

	Not Collected	Collected		Would Benefit From Additional Guidance on This Topic
		By Agency	By Vendor	
a. Network-level IRI (International Roughness Index)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
b. Network-level pavement surface distress <b>using automated equipment</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
c. Network-level pavement surface distress <b>using manual methods</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>
d. Network-level pavement friction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
e. Network-level pavement deflection testing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
f. Network-level ground penetrating radar (GPR)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
g. Network-level condition information on highway entrance/exit ramps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
h. Network-level condition information on shoulders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
i. Other network-level data collected (please explain):	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>

Comments: \_\_\_\_\_

7. This question explores the degree to which your agency’s current data collection practices satisfactorily addresses your needs. The results will help us identify gaps between current and desired data collection practices. If any of the items listed in the table are not relevant to your agency, you can indicate that using the last column, *Do Not Know or Not Applicable*. You are encouraged to explain your responses using the Comment box provided for each item in the table, especially if you picked “Somewhat Agree” or “Disagree” as your response so we can learn more about what changes in practice or additional support would be helpful to you.

	<b>Agree</b>	<b>Somewhat Agree</b>	<b>Disagree</b>	<b>Do Not Know or Not Applicable</b>
<p>a. Our data collection practices adequately address our agency’s needs in terms of the information being collected and the quantity/quality of the data.</p> <p>Comments:</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>b. Our data collection practices make it relatively easy to address applicable federal, state, or local requirements.</p> <p>Comments:</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>c. Our agency’s data collection efforts are streamlined by piggybacking the collection of information on other assets (for example, data on signs or guardrail) with pavement management surveys.</p> <p>OPTIONAL: Identify data collected:</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>d. Available pavement history data is adequate to meet our agency’s needs.</p> <p>Comments:</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>e. GIS-based technology is used effectively to support pavement management reporting and/or pavement management decision-making</p> <p>Comments:</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- 8. Our agency has a documented data quality management plan in place.
  - a. Yes
  - b. No
  - c. We are working on it
  - d. We intend to do this in the future

9. This question explores the degree to which innovative or emerging tools and technology are being used to support your pavement management efforts. For each line in the table, please indicate whether your agency is using or considering the use of the tool or technology to support pavement management efforts (rather than other agency efforts). The last column allows you to identify topics that would benefit from additional guidance or FHWA technical support. Comment fields are provided if you want to explain your response or identify guidance that might be needed to enhance your use of the specific tool or technology.

Tools	Yes	No	Under Consideration	Would Benefit From Additional Guidance on This Topic
a. Data collection with small, unmanned aircraft systems (UAS), such as drones.  Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
b. Network-level data collection using smartphone-based technology, such as the collection of IRI data using smartphone accelerometer measurements.  Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
c. Commercial or publicly-available geospatial tools (such as mapping tools, GIS tools, GPS data, landscape visualization tools, satellite imagery, right-of-way imagery, etc.) to review and verify	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>



data related to pavement construction activities.  Comments:				
d. Crowd-sourced data collection using vehicle sensors, mobile phones, or satellites for applications such as reporting pothole locations or traffic congestion.  Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
e. LiDAR (a technique to render a 3-D image of an asset)  Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
f. Other innovative technology: (Please explain in the comment box)  Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>

### 3.2 Performance Management and Target Setting

10. This question explores your satisfaction with the use of pavement management data to support performance management and target setting. The results will help us identify gaps between current and desired data collection practices and areas that might benefit from additional FHWA technical support. If any of the items listed in the table are not relevant to your agency, you can indicate that using the last column, *Do Not Know or Not Applicable*. You are encouraged to explain your responses using the Comment box provided for each line in the table, especially if you picked “Somewhat Agree” or “Disagree” as your response so we can learn more about what changes in practice would be helpful to you.

	<b>Agree</b>	<b>Somewhat Agree</b>	<b>Disagree</b>	<b>Do Not Know or Not Applicable</b>
a. Pavement management information is used to set agency, regional, or federal targets.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:				
b. Pavement management information is provided to our agency by another agency (such as a state DOT providing information to a local agency) for target-setting purposes.	○	○	○	○
Comments:				
c. Pavement performance targets are a significant consideration in driving pavement investment decisions.	○	○	○	○
Comments:				
d. Historical pavement performance measures can easily be used to satisfy federal or local performance reporting requirements (such as those defined in 23 CFR 490 Subpart C <sup>10</sup> or state-legislated requirements)	○	○	○	○
Comments:				
e. Our existing pavement condition data is adequate to set achievable pavement performance targets.	○	○	○	○
Comments:				
f. Our agency has adequate guidance and/or training available to meet any federal or local pavement performance reporting requirements.	○	○	○	○
Comments:				
g. Our agency uses non-traditional pavement performance measures, such as environmental and societal impacts in addition to pavement conditions.	○	○	○	○
Comments:				

<sup>10</sup> <https://www.ecfr.gov/cgi-bin/text-idx?SID=27d933287b42b23c7c0ebf3106831085&mc=true&node=pt23.1.490&rgn=div5>

### 3.3 Analysis, Project Selection, and Reporting

11. This question explores your satisfaction with the use of pavement management data to conduct analyses, select projects, and report information. The results will help us identify gaps between current and desired data collection practices and potential areas needing FHWA support. If any of the items listed in the table are not relevant to your agency, you can indicate that using the last column, *Do Not Know or Not Applicable*. You are encouraged to explain your responses using the Comment box provided for each line in the table, especially if you picked “Somewhat Agree” or “Disagree” as your response so we can learn more about what changes in practice or additional technical support would be helpful to you.

	Agree	Somewhat Agree	Disagree	Do Not Know or Not Applicable
a. Our pavement performance models are reliable.  Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Our future condition forecasts consider risks, such as those associated with extreme weather events or traffic variability.  Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. We review and update our pavement performance models on a regular basis (e.g., every 3-5 years, after each data collection cycle, or when the long-range plan is updated).  Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Our pavement management analysis considers treatments over the entire life cycle (such as preventive maintenance, rehabilitation, and reconstruction)  Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Treatment rules and costs are reviewed on a regular basis (e.g, every year, every few years, or when new treatments are introduced).  Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>f. A feedback loop has been established to ensure construction records and other information are used to update the pavement management system database and models.</p> <p>Comments:</p>	○	○	○	○
<p>g. Our pavement management analysis optimizes the use of available funding over a multi-year period.</p> <p>Comments:</p>	○	○	○	○
<p>h. The recommendations from our pavement management system closely match the projects and treatments that are funded. (Note: 70% or better is considered a close match)</p> <p>Comments:</p>	○	○	○	○
<p>i. Our pavement management system is effective at estimating current and future funding needs.</p> <p>Comments:</p>	○	○	○	○
<p>j. The information from our pavement management system is adequate to meet our needs for communicating with internal stakeholders.</p> <p>Comments:</p>	○	○	○	○
<p>k. The information from our pavement management system is adequate to meet our needs for communicating with external stakeholders.</p> <p>Comments:</p>	○	○	○	○

### Section 4. Pavement Management Uses

Questions posed in this section explore how pavement management is used in your agency and areas that would benefit from further assistance.

12. This question explores your satisfaction with how pavement management information is used to support other departments or activities within or outside of your agency. When answering this question, please consider whether pavement management information is used by people OUTSIDE of your pavement management office. For instance, we are curious as to whether the information is used by designers or whether district personnel use the data to select projects. Does your agency leadership rely on pavement management information? The results will help us identify gaps between current and desired data collection practices that might benefit from additional guidance or support.

If any of the lines in the table are not relevant to your agency, you can indicate that using the last column, *Do Not Know or Not Applicable*. You are encouraged to explain your responses using the Comment box provided for each line in the table, especially if you picked “Somewhat Agree” or “Disagree” as your response so we can learn more about what changes in practice would be helpful to you.

	Agree	Somewhat Agree	Disagree	Do Not Know or Not Applicable
a. Pavement management data is used widely by others within our agency (e.g., federal reporting, asset management, safety, districts, construction, project scoping).  Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Pavement management data is used by pavement designer to develop pavement structural designs and/or conduct life-cycle cost analyses at our agency.  Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Pavement management data has been used to calibrate mechanistic-empirical design models (such as those in AASHTO’s Pavement ME Design software).  Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Pavement management personnel are actively involved in developing our agency’s	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>Transportation Asset Management Plan.</p> <p>Comments:</p>				
<p>e. Pavement management information is integrated into agency long-term planning activities, such as a Long-Range Strategic Plan.</p> <p>Comments:</p>	○	○	○	○
<p>f. Pavement management information is used to support agency project selection and/or programming decisions for capital projects.</p> <p>Comments:</p>	○	○	○	○
<p>g. Pavement management data is used by maintenance personnel for work scheduling and/or planning.</p> <p>Comments:</p>	○	○	○	○

## Section 5. Opportunities

Questions presented in this section explore areas of future development where additional research, guidance, or other technical support might be needed.

13. This last question explores your interest in different types of future development for pavement management. For each of the lines in the table, please indicate whether you are highly interested, somewhat interested, or not interested in addressing this topic over the next 10 years. You can add items to the table to identify additional future developments your agency expects to make. You are also encouraged to use the comment field associated with each line in the table to explain your response or to identify additional guidance needed in that area.

<b>Actions Anticipated Over The Next Several Years</b>	<b>Highly Interested In This</b>	<b>Somewhat Interested In This</b>	<b>Not Interested</b>
a. Using new or innovative data collection technologies (such as crowd-sourced data or unmanned aerial devices) Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Establishing national standards for pavement cracking or other pavement performance measures Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Improving data quality Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Reducing the time between data collection and availability of results Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Adding additional types of pavement data to the system (such as pavement foundation, material properties, mix design) Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Improving consistency in our linear referencing system across programs Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Establishing data governance standards Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Improving pavement performance models Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Using pre-treatment conditions to better estimate expected treatment life Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Documenting performance models and treatment rules Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Establishing a framework for incorporating pavement sustainability and resiliency considerations into the pavement management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

system Comments:			
l. Integrating risk into pavement management models and analysis Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. Enhancing life cycle planning capabilities Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. Improving the alignment of pavement management recommendations and funded projects Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
o. Incorporating maintenance into the pavement management analysis Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
p. Considering a broader set of factors in project selection, such as transit, bike/ped, social equity, access, and risk Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
q. Developing a multi-objective project selection process Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
r. Planning for staff transitions Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
s. Developing more effective communication tools Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
t. Acquiring new software tools to support pavement management Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
u. Quantifying the benefits of pavement management Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
v. Better integrating pavement management into agency decisions Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
w. Training agency staff on pavement management Comments:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
x. Other: (Please describe)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

OPTIONAL: Please use the comment box for any additional information you would like to provide related to your pavement management practices.

Comments: