SUMMARY**REPORT**

# Extending the Life of Highway Infrastructure: Summary of 2023 and 2025 TRB Data Workshops

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## INTRODUCTION

During the 2023 and 2025 Transportation Research Board (TRB) Annual Meetings, the Federal Highway Administration (FHWA) held two workshops that focused on using data to increase the longevity of the Nation's pavement and bridge infrastructure.

The primary objectives of the workshops were to highlight transportation data sources and how the data are being used by researchers around the country to perform analyses and develop practical tools to extend the life of highway infrastructure assets. The 2023 workshop discussed using available data to extend the life of highway infrastructure. Similarly, the 2025 workshop focused on the data that extend the lifecycle of highway infrastructure assets. More than 170 people—at least 50 in 2023 and 120 in 2025—participated in the two workshops.

The workshops were sponsored by the TRB Infrastructure Group, three TRB sections, and 13 TRB standing committees. This document summarizes the key topics discussed at the two workshops.

## 2023 WORKSHOP: USE OF AVAILABLE DATA TO EXTEND THE LIFE OF HIGHWAY INFRASTRUCTURE

The discussions held at the 2023 workshop are grouped into the following topics:

- Available data sources.
- Importance of database structure.
- Pavement construction and quality assurance (QA) data.
- Nondestructive evaluation (NDE) data.
- Tools developed using available data.
- Lessons from Long-Term Infrastructure Performance (LTIP) research for building better highway infrastructure.

### Available Data Sources

The FHWA Office of Infrastructure Research and Development's LTIP programs—Long-Term Pavement Performance (LTPP) and Long-Term Bridge Performance (LTBP)—have been collecting infrastructure data for many years. Data have also been collected by materials testing laboratories and other Federal research projects. In addition, highway agencies, the transportation industry, research institutes, and universities have also been actively collecting infrastructure data. Figure 1 shows the 2023 workshop audience.

U.S. Department of Transportation
Federal Highway Administration

Turner-Fairbank
Highway Research Center

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https://highways.dot.gov/research

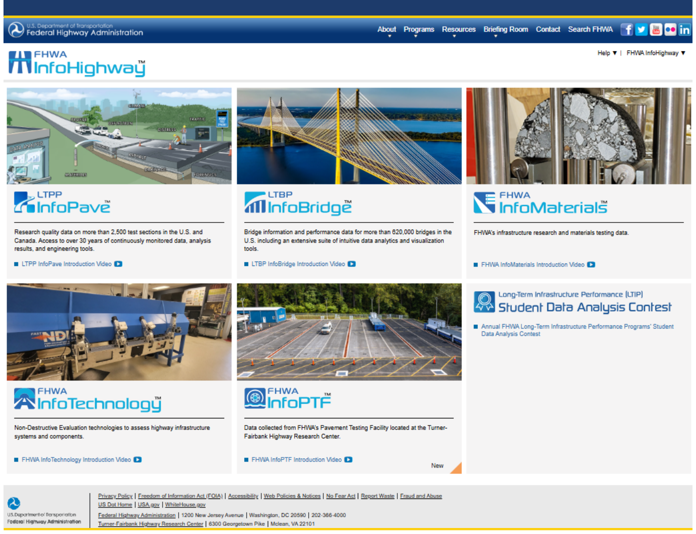
**Figure 1. Photo. Attendees of 2023 workshop.**


Source: FHWA.

The 2023 workshop kicked off with an overview of the FHWA InfoHighway™ web portal (figure 2), which includes LTPP InfoPave™, LTBP InfoBridge™, and InfoMaterials™ (FHWA n.d.a., n.d.b., n.d.c., and n.d.d.). These portals provide easy access to an enormous amount of data on pavements, bridges, infrastructure materials, and tools and products that can be used in everyday work. InfoPave contains long-term monitoring data for 2,581 pavement test sections located throughout the United States and Canada. InfoBridge includes data on over 623,000 bridges in the United States. InfoMaterials contains infrastructure research and materials testing data collected through FHWA, State, and other national efforts. InfoPave and InfoBridge have developed practical and useful tools using technically sound analysis. Some of these tools are integrated into the portals.

The third-generation, accelerated Pavement Testing Facility (PTF) at Turner-Fairbank Highway Research Center in McLean, VA provides access to data collected by FHWA. In 2024, the FHWA InfoPTF™ web portal was launched (FHWA n.d.e.). In addition to FHWA data sources, accelerated pavement testing research facilities associated with entities that include Minnesota Department of Transportation (DOT), Florida DOT, Texas A&M University, and the National Center for Asphalt Technology at Auburn University also collect pavement performance data.

**Figure 2. Screenshot. FHWA InfoHighway web portal.**




Source: FHWA.

## Importance of Database Structure

When working with large datasets, structured databases and knowledge of the associated metadata are needed. In addition, the following basic attributes are important for building trust and confidence in data:

- Qualified, experienced, and trained data collectors.
- Consistent use of data collection and data-testing protocols.
- Calibrated data collection equipment.
- Quality control and quality assurance of published data.
- Documented metadata.

With many ongoing data collection efforts around the country, coordination of national databases is needed. Opportunities also exist to use data collected from construction and data collected using advanced technologies that lend themselves to analyses for more efficient highway infrastructure management.

## Pavement Construction and Quality Assurance Data

In addition to the need for a structured database to house infrastructure highway data, incorporating data from QA practices during pavement construction is also helpful in ensuring improved pavement life. Information on existing QA practices and available construction data provide valuable insights to establish advanced QA testing procedures, which can potentially improve the performance and management of the Nation's highways.

The National Cooperative Highway Research Program (NCHRP) guidance manual, NCHRP 10-108: *Manual for Incorporating Nondestructive Testing (NDT) in Quality Assurance of Highway Pavement Construction*, was developed to assist highway agencies in selecting and incorporating NDT methods into their QA programs for highway pavement construction (National Academies of Sciences, Engineering, and Medicine 2022a, 2023). See table 1 for details.

**Table 1. NDT technologies for process control and acceptance (National Academies of Sciences, Engineering, and Medicine 2023).**

| Technology | Material, Layer Property, Feature | Coverage |
|---|---|---|
| Paver-mounted thermal profiling[1] | HMA mat temperature | Continuous coverage |
| Electrical impedance[1] | HMA mat density | Random point-based |
| Concrete maturity[1] | PCC strength | Random point-based and representative of the lot |
| Intelligent compaction[1] | Drum response to individual layer modulus | Continuous coverage |
| Electrical resistivity[2] | PCC resistivity as an indicator of permeability and durability | Representative of the lot |
| Magnetic pulse induction[2] | Thickness of HMA or PCC layer, dowel base alignment | Point-based for thickness; full coverage for dowels |
| Dielectric profiling system[2] | HMA mat density | Continuous coverage |
| Lightweight deflectometer[2] | Stiffness of aggregate base | Random point-based |
| Soil density gauge[1,2] | Density and water content of aggregate base | Random point-based |

[1]QA program process control.
[2]QA program acceptance.
HMA = hot-mix asphalt; PCC = portland cement concrete.

## NDE Data

NDE methods can be applied to transportation structures to determine specific material properties or structural and functional features directly related to performance. For example, surface resistivity can determine material properties, phased array ultrasound can locate internal defects, and ground penetrating radar (GPR) can measure pavement thickness. Such monitoring activities allow infrastructure owners to better manage their infrastructure and extend its service life. However, effective application and interpretation of NDE data are only possible with informed selection and application of the NDE method and analysis procedures.

For example, NDE methods that are effective for steel structural elements may not be suitable or as effective for reinforced concrete elements or pavements. Thus, understanding the differences in the infrastructure element types, the specific properties being measured, the desired accuracy, and the application limits of NDE methods is crucial. Some NDE tasks are more challenging to accomplish than others. In concrete, the prediction of in-place material compressive strength might have high variability using NDE, which might make the technology more applicable for process control rather than acceptance.

Informative resources that are available to the end-user provide guidance on best practices for infrastructure NDE application, presentation, and interpretation, including technical committee documents (e.g., American Concrete Institute document 228.2R), research reports (e.g., SHRP 2 research report series), and websites (e.g., https://infohighway.fhwa.dot.gov/) (National Academies of Sciences, Engineering, and Medicine 2025; American Concrete Institute 2013; FHWA n.d.a.). A case study of applied NDE presented at the 2023 workshop showed how delamination in concrete bridge decks is characterized using the impact-echo method. The point measurements in impact echo can result in large amounts of data. Air-coupled sensing was employed to collect a large amount of data in a reasonably short time. However, the data can be evaluated through an imaging approach. The result is an image that represents the areal surface of the bridge deck, where the location and extent of corrosion-induced delamination damage are indicated accurately. The accuracy of the impact-echo method was confirmed on an active highway bridge deck through core sample extractions.

## Tools Developed Using Available Data

The Transportation Pooled Fund Study TPF-5(432), "Bridge Element Deterioration for Midwest States: Iowa, Illinois, Indiana, Kansas, Kentucky, Michigan, Minnesota, North Dakota, Nebraska, Ohio, South Dakota, and Wisconsin," used data on inspection practices and policies and practices related to bridge construction, preservation and maintenance, construction history, and the deterioration curves developed by the subject States (Meinel 2023). National Bridge Inventory and National Bridge Element data were also used for the study (FHWA n.d.f.).

The study developed bridge element-level deterioration models for national bridge elements, bridge management elements, and agency-defined elements (Meinel 2023). The key parameters of the stochastic models include transition times between condition states and Weibull distribution parameters (Nielsen 2011). The study made several recommendations, including standardizing deck condition assessment and treatment and work history documentation across agencies to enhance data consistency and model accuracy. The findings also emphasized the potential benefits of collecting and tracking data on specific treatments and defect-based deterioration, which could enhance future deterioration models and bridge management practices.

The study also identified deterioration parameters for bridge management systems, delivered models tailored to support both project- and network-level decisionmaking, and made recommendations for harmonizing data collection and model use across agencies (Meinel 2023). Future work needs to focus on improving data sharing, standardizing inspection and coding practices, and incorporating advanced data and analysis methods to further refine deterioration models.

On a similar note, the LTBP Program developed the following three productivity tools, which are available in InfoBridge (FHWA n.d.c.):

- Asset Valuation.
- Bridge Performance Forecast Models.
- Historical Bridge Design Specification Changes.

Also available in InfoBridge is the Bridge Deck Preservation Tool (BDPT) (FHWA n.d.g.). The BDPT helps select maintenance and preservation actions for concrete bridge decks. The tool was developed under the *Bridge Deck Preservation Portal* study, TPF-5(474), which was funded by the Iowa, Indiana, Minnesota, Missouri, New Mexico, and Texas DOTs and FHWA. The various preservation actions are compared based on costs, service life extensions, and the uncertainty of individual actions.

The Asset Valuation tool estimates the replacement value and existing value of bridges (FHWA n.d.h.). The replacement unit cost can be specified by the user. Alternatively, the cost can be selected from the Bridge Replacement Unit Costs web page, which is compiled by FHWA and is based on data submitted by the States (FHWA 2025). The existing value of a bridge depends on its condition and load-carrying capacity.

InfoBridge features three Bridge Performance Forecast Models (FHWA n.d.i.). The *time-in-condition* model is the simplest and relies on regression analysis performed on preselected bridge datasets. The *deep-learning* model uses machine-learning (ML) techniques to look for patterns and data interdependencies in a completely automated way. The *proportional hazards deterioration* model uses survival analysis to look for factors affecting the condition rating durations to predict future condition ratings and durations. The *deep-learning* and *proportional hazards deterioration* models also employ state-of-the-art big data analysis techniques using stochastic methods.

The Historical Spec Changes tool presents easily searchable, chronological listings of bridge design specifications, leading researchers to develop cause-and-effect relationships to understand the performance of bridges designed during different periods (FHWA n.d.j.).

Similarly, the more than three-decades-long LTPP program has developed many tools and products that have significantly improved pavement testing and design processes. The data collection protocols and the comprehensive database are the most important products of the program. The pavement performance database has increased understanding of the long-term performance of different types of pavements used on the Nation's highway system. Figure 3 shows the speaker talking about the tools and products developed by the LTPP program.

The LTPP data was used in the development of the *Mechanistic-Empirical Pavement Design Guide* under NCHRP 1-37A (National Academies of Sciences, Engineering, and Medicine 2022b). The field-calibrated

**Figure 3. Photo. Tools and products presentation; speaker Gonzalo Rada (standing) and moderator Deborah Walker.**


Source: FHWA.

distress models have been improved, enhanced, or customized for agencies over the last two decades under many State-funded and NCHRP studies. In addition, the LTPP program developed several useful tools and products, including national standards for State DOTs, researchers, and practitioners, such as the LTPP *Distress Identification Manual* and the American Association of State Highway and Transportation Officials (AASHTO) manuals AASHTO T 256: *Standard Method of Test for Pavement Deflection Measurements*, AASHTO M 320: *Standard Specification for Performance-Graded Asphalt Binder*, and AASHTO M 331: *Standard Specification for Smoothness of Pavement in Weigh-in-Motion (WIM) Systems* (AASHTO 2001, 2017a, 2017b).

The LTPP program has also yielded other significant findings, including the characterization of loading, environmental impacts, material property models, and material performance on pavements. These insights have led to improved strategies for planning maintenance and preservation treatments, thus enhancing pavement asset management practices.

### Lessons From Long-Term Infrastructure Performance Research for Building Better Highway Infrastructure

The LTPP program encompasses over 30 yr of data collection, research, and innovations in pavement performance, with over 2,500 test sections across North America. This extensive study has advanced the understanding of pavements and their performance under various conditions. Similarly to the bridge research component of LTIP, the LTBP Program maintains a copy of the National Bridge Inventory database, which includes over 620,000 bridges, and appends it annually (FHWA n.d.f.). Additionally, LTBP research results and productivity tools are stored within the InfoBridge™ web portal (FHWA n.d.c.).

The LTBP program is researching links between specific policies, actions, and the resulting changes in bridge element performance. This research will improve the understanding of bridge deterioration, serviceability, and durability. Both programs, LTPP and LTBP, collect similar data, such as weather, load, materials, and response, but use different collection methods.

By integrating the knowledge gained from both the LTPP and LTBP Programs, FHWA can significantly improve the design, construction, maintenance, preservation, and management of infrastructure assets. The insights from LTIP research provide a robust foundation for building better highway infrastructure. By leveraging decades of data and research, FHWA can develop more resilient, durable, and efficient infrastructure.

### Roundtable Discussion

The 2023 workshop concluded with a roundtable discussion of various topics related to infrastructure data. The questions discussed were as follows:

- How can infrastructure professionals be encouraged to use the available data?
- How can the data be used effectively?
- Are current data collection efforts addressing analysis needs?
- What data are useful? Are these data being collected?
- What data are missing? (Gap analysis.)

#### *Summary of Roundtable Discussion*

The workshop attendees learned that infrastructure data are available from Federal, State, industry, and research entities. Credibility of the data source is important in trusting the data accuracy. Users need to be trained to properly use and analyze the available data. This training is particularly important for the NDE data. InfoPave offers analysis-ready datasets that can be used with minimal data wrangling. Metadata are valuable for properly using available data, as they provide information, such as how the data were collected, data format, and equipment used to collect the data. Making the infrastructure community aware of the availability of the data with regular communication through newsletters, technical papers, and conference presentations is crucial.

Although data collection is an expensive undertaking, performance data collected over long periods is necessary to understand and analyze pavement and bridge performance. Best practices for data collection are as follows:

- Data collection with the intended uses in mind is crucial.
- The granularity of the data depends on the data type.
- Data collection equipment and operator certification are important; this concern is especially true to ensure that the data being collected are accurate and reliable.
- Much-needed maintenance data for better condition-forecasting models are lacking.
- A large amount of project-level data is available; however, increased efforts for network-level data collection are needed.

## 2025 WORKSHOP: DATA THAT EXTENDS THE LIFECYCLE OF HIGHWAY INFRASTRUCTURE ASSETS

The objectives of the 2023 workshop were to highlight various transportation data sources and how data are being used by researchers around the country to perform analyses and develop practical tools to extend the life of highway infrastructure assets.

Building on the discussions of the 2023 workshop, a follow-up workshop was held in 2025 with the focus on data that extend the lifecycle of highway infrastructure assets. The workshop featured the following four breakout groups, where the participants shared their experiences and ideas for data analyses and additional research:

1. Lifecycle Extension Through Preservation.
2. Effect of Weather and Traffic.
3. Resilient Highway Infrastructure.
4. Emerging Data Sources and Data Science.

The 2025 workshop kicked off with a welcome and opening remarks by the Chair of the Pavements Section, the workshop sponsor. The welcome was followed by presentations by four TRB committee chairs, who discussed committee objectives, data needs, and ideas for collaboration. The four standing committees were as follows:

- Pavement Condition Evaluation (AKP10).
- Pavement Structural Testing and Evaluation (AKP40).
- Bridge and Structures Management (AKT50).
- Bridge Preservation (AKT60).

Figure 4 shows the 2025 workshop audience.

The Pavement Condition Evaluation Committee is concerned with concepts, systems, and procedures for the acquisition, processing, and implementation of pavement performance data. A key area of interest to this committee is automated pavement distress measurement and interpretation technologies.

The Pavement Structural Testing and Evaluation Committee is dedicated to the structural testing and evaluation of pavement systems. The information obtained from these tests is crucial for characterizing individual pavement layers and determining the overall performance of pavements. This goal is achieved through direct pavement response measurements, modeling, correlation, and other methods. By leveraging advanced testing techniques, such as falling weight deflectometers, traffic speed deflection devices, full-scale accelerated pavement testing, and GPR, the committee aims to enhance understanding of pavement behavior and improve the design, maintenance, and management of pavement systems. By leveraging the LTPP program data, the committee can significantly improve the design, maintenance, and management of pavement systems, leading to more durable, cost-effective, and safe roadways.

The Bridge and Structures Management and Bridge Preservation Committees are concerned with research, methods, and tools that can extend the useful life of bridges through preservation treatments and design and construction practices. Data pertaining to highway bridges and culverts are needed to document as-built or existing configuration, determine current preservation needs, predict future condition and structural performance, and track preservation program effectiveness. The Chair suggested a few ideas in working with industry developers and providers to assess applications, as follows:

- Advanced NDE methods for material and defect characterization.
- Artificial intelligence (AI) and ML—Enhanced data analysis and reporting.
- Improved bridge management system database functionality and interaction.
- Building information modeling and digital twin applications for detailed performance tracking.
- Advanced modeling for better structural performance assessment and service life prediction.

The workshop continued with participants choosing one of the four breakout groups to further discuss how data can be used to extend the life of highway infrastructure assets. The following sections summarize the breakout-group discussions.

**Figure 4. Photo. Attendees of 2025 workshop.**

Source: FHWA.

## 1. LIFECYCLE EXTENSION THROUGH PRESERVATION

A large gap in preserving U.S. highway infrastructure is the lack of standardization of maintenance and preservation activity data. Highway agencies need guidance, best practices, and adequate and dedicated funding to monitor the performance of maintenance and preservation activities. Current roadway and bridge performance measures are focused on poor condition ratings. This focus can distract from the need to prioritize maintaining and extending the state of roads and bridges in good and fair condition. Objectively documenting the benefits of preservation treatments is also needed. Opportunities exist for improvement in modeling service life extension on the Nation's roads and bridges. Given the vast amount of data and technological tools, now is the time to take action to monitor preservation treatments using standardized data collection procedures, equipment, and collection frequency.

## 2. EFFECT OF WEATHER AND TRAFFIC

Many external factors impact the performance of the Nation's roads and bridges. The results of extreme weather events and heavy traffic loads can adversely impact the performance and longevity of the highway infrastructure. Pavement design has typically been based on 100-yr storm events, with a design life of 25–30 yr. Other extreme weather events should also be included in pavement design. Performance data are needed before and after these events. In general, there are gaps in knowledge and data. There is a lack of understanding of the behavior and responses of the pavement structure in extreme weather. Several models exist but only to the extent of analytical evaluations and not for forecasting how pavements will perform after the events. Gaps also exist in terms of the design of pavements to survive events that might occur suddenly and not routinely. Also, there is a need to better understand the influence of the torque from electric vehicle motors on the tire interaction with the pavement surface. Gaps also exist in understanding the significance of autonomous vehicles platooning and of any increased impacts caused by the heavier weight of electric vehicles compared to gas vehicles.

Some parts of the country are more prone to traffic loading impacting pavement performance; meanwhile, weather is the determining factor in other parts of the country. Indexes for traffic and weather should be developed to help understand their effect on the performance of the pavement. Can AI be used to create future pavement deterioration models based on weather and traffic data? Currently, there is no data that can be used to address extreme weather events for certain groups of infrastructure assets. In addition, there is limited uniform pavement maintenance data that can be used to improve the deterioration models. The trigger factors for concrete pavement buckling under extreme weather events are still unknown. Some indications are that they are related to pavement underdrain. There is a need to understand how moisture moves from the upper layers to the lower layers of pavements and the resulting effect on pavement degradation. There is a need to create weather forecast models for the design of resilient highway infrastructures. Figure 5 shows breakout group participants discussing the impact of weather and traffic on the highway infrastructure.

**Figure 5. Photo. Participants, including co-moderators Larry Wiser (fourth from left) and Tommy Nantung (fifth from left) and Jean Nehme (third from left) of breakout group 2—effect of weather and traffic.**

Source: FHWA.

## 3. RESILIENT HIGHWAY INFRASTRUCTURE

Over the past several years, focus has increased on building highway infrastructure that is cost-effective but can still withstand manmade and natural disasters. To effectively address this issue, certain metrics are needed, such as performance data and weather information. Except for performance data that are readily available from States or the LTPP program, information for the other metrics, such as natural event impacts, effects on road users, and detour impacts, are only partially available or not available at all. Other information that currently exists includes connected vehicle data (cloud and local) and bridge data. A cultural change from "this is how it's done" to "but it can be done differently" is needed. As part of this cultural change, cross-discipline collaboration and data sharing are critical. Data currently collected are not necessarily suited or used for resilience considerations. Standardization of data collection and processing are needed. Data from multiple sources have difficulty interfacing with each other. Also, issues exist with data accuracy, resolution, and integrity. Lastly, emerging AI and ML techniques may provide opportunities to process large datasets to assist with multifaceted decisionmaking processes with resilience considerations. Figure 6 shows the breakout group discussing how to build a more resilient highway infrastructure.

**Figure 6. Photo. Participants, including co-moderators Jane Lin and Amir Golalipour (standing) of breakout group 3—resilient highway infrastructure.**

Source: FHWA.

## 4. EMERGING DATA SOURCES AND DATA SCIENCE

Emerging technology developments have enabled the collection of large and sometimes improved infrastructure data, both spatially and temporally. For example, embedded sensors, cell phones, connected vehicles, drones, and satellites can collect continuous data across transportation infrastructure at frequent intervals. Advancements in data science and AI and ML have made it possible to process these new and big data sources more efficiently and effectively for decisionmaking. Whereas data crowdsourcing is becoming available for cell phones and connected vehicles, purchasing the data is expensive, and standardization is not adequate to enable integration of disparate data sources. Ideally, smart highway infrastructure systems should include embedded sensors (strain gauges, pressure cells, etc.) to report current conditions, the interventions needed, and the timing. However, in the interim, these emerging data sources can augment the legacy standardized data to provide a more informed decisionmaking process. To move beyond "solutions in search of problems," emerging technologies should be leveraged for pertinent applications and specific objectives.

These emerging data sources have promise, but their successful implementation is hindered by cost, low confidence in the data, standardization issues, and a lack of champions to promote their usefulness. Data standardization for new technologies, beyond the standardization of the technology itself, is needed so that various data sources can be integrated before being used to make decisions. For example, data schema and protocols are needed to facilitate adoption of technologies and encourage a healthy market for the given technology. Interoperability among different data sources is needed to use these sources in multi-objective and multicriteria decisionmaking. In terms of data science, data geographic information system integration based on the location of the asset remains a challenge for many highway agencies. Processing large amounts of spatial and temporal data is also a challenge. This fact is true even for existing technology, where information is summarized into one index for a certain length of the roadway. There is skepticism about black-box syndrome data processes, such as AI and ML. Transparency and confidence in the data are needed. Staff turnover causes issues with the consistency of legacy technologies, and even more so with evaluating and transitioning toward new technologies.

## CONCLUDING REMARKS

Representatives from all sectors of the highway infrastructure community attended the workshops, including transportation agency engineers, researchers, university professors and students, consultants, and contractors. Ideas for new data sources, productivity tools, and suggestions for standardizations were discussed during the two workshops. The following are noteworthy findings:

- Vast amounts of infrastructure data are available; however, readily available network-level data for research and analysis is lacking.
- Timely communication of the data availability is important.
- Standardization of data collection, collaborative research, coordination of research, and development of national databases are needed.
- Emphasis on prioritizing the preservation of assets in good and fair condition over a focus solely on those in poor condition is essential.
- Effective preservation processes for roads and bridges need to be researched and established.
- Research is needed to understand the effects of extreme weather on pavements and bridges and the

impacts of electric vehicles and truck platooning on highway infrastructure.

- Several productivity tools and national standards have been developed. See section on *Tools Developed Using Available Data* under the 2023 workshop.
- A coordinated effort is needed to develop software or a processing tool that can accept various infrastructure data formats, such as FHWA's *Collaborative Highway Asset Research: Integrated Sensor-Modeling Application (CHARISMA)* for the unified analysis and visualization of GPR data collected using various formats (FHWA n.d.k.). Crowdsourcing of data can be an effective technique to quickly record vast amounts of certain data types. Protocols and standardization need to be developed for the ease of data use and reliability.

## ACKNOWLEDGMENTS

FHWA's Office of Infrastructure Research and Development's LTIP Team extends its gratitude to the sponsors and cosponsors of the workshops. In addition, FHWA also thanks the presenters, panel members, moderators, and attendees for sharing their experiences and ideas, which contributed to the success of the workshops.

| 2023 and 2025 Workshop Sponsors and Cosponsors | |
|---|---|
| **Sponsor** | Pavements Section (AKP00), Chair Bouzid Choubane |
| | Pavements Section (AKP00), Chair Gonzalo Rada |
| **Cosponsors** | Highway Traffic Monitoring (ACP70), Chair Ioannis Tsapakis |
| | Transportation Infrastructure Group (AK000), Chair Tara Cavalline |
| | Testing and Evaluation of Transportation Structures (AKB40), Chair Hoda Azari |
| | Geotechnical Instrumentation and Modeling (AKG60), Chair Soheil Nazarian and Chair Derrick Dasenbrock |
| | Pavement Condition Evaluation (AKP10), Chair Gerardo Flintsch |
| | Design and Rehabilitation of Concrete Pavements (AKP20), Chair Kurt Smith |
| | Design and Rehabilitation of Asphalt Pavements (AKP30), Chair Leslie Myers |
| | Pavement Structural Testing and Evaluation (AKP40), Chair Gonzalo Rada and Chair Jenny Li |
| | Pavement Surface Properties and Vehicle Interaction (AKP50), Chair Magdy Mikhail (2023) and Chair Brian Schleppi |
| | Highway Maintenance Section (AKR00), Chair Anita Bush |
| | Infrastructure Management and System Preservation Section (AKT00), Chair Judith Corley-Lay |
| | Pavement Management Systems (AKT10), Chair Linda Pierce and Chair Amy Simpson |
| | Pavement Preservation (AKT20), Chair DingXin Cheng |
| | Pavement Maintenance (AKT30), Chair Andrew Braham |
| | Structures Maintenance (AKT40), Chair Richard Dunne |
| | Bridge and Structures Management (AKT50), Chair Anne Rearick |
| | Bridge Preservation (AKT60), Chair Michael Brown |

## 2023 Workshop Agenda

### USE OF AVAILABLE DATA TO EXTEND THE LIFE OF HIGHWAY INFRASTRUCTURE

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|---|---|
| **Welcome and Opening Remarks** | Bouzid Choubane, Director, National Center for Pavement Preservation, Michigan State University |
| **Available Highway Infrastructure Data** | |
| *FHWA InfoHighway™* | Jean Nehme, Jane Jiang, and Shri Bhidé, LTIP Team Members, FHWA |
| *Importance of Database Structure and Metadata* | Ben Worel, Minnesota Department of Transportation |
| *MnROAD's Experience Incorporating Nondestructive Testing in QA for Pavement Construction—Guidelines from NCHRP 10-108* [National Academies of Sciences, Engineering, and Medicine 2023] | Chetana Rao, Principal, Rao Research and Consulting, LLC |
| *Use of Bridge Data in Developing Deterioration Models What Are We Learning?* | Başak Bektaş, Assistant Professor of Civil Engineering, Minnesota State University |
| *Tools and Products Based on LTPP Data and Protocols* | Gonzalo Rada, Senior Principal Engineer, WSP |
| **Practical Use Case of (NDE) Data** | John Popovics, Professor, University of Illinois |
| **Could Lessons Learned From LTIP Research Help Build Better Highway Infrastructure?** | Gabe Cimini, Business Center Operations Leader, Stantec Consulting Services |
| **Roundtable Discussion** | Panel: Jean Nehme (FHWA), Bouzid Choubane (National Center for Pavement Preservation), Soheil Nazarian (University of Texas at El Paso), Dulce Feldman (Caltrans), and Hoda Azari (FHWA)<br>• How can infrastructure professionals be encouraged to use the available data?<br>• How can the data be used effectively?<br>• Are current data collection efforts addressing analysis needs?<br>• What data are useful? Are they being collected?<br>• What data are missing? (Gap analysis.) |

## 2025 Workshop Agenda

### DATA THAT EXTENDS THE LIFECYCLE OF HIGHWAY INFRASTRUCTURE ASSETS

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|---|---|
| **Welcome and Opening Remarks** | Gonzalo Rada, Vice President, Pavement Consultancy Services, WSP |
| **FHWA InfoHighway™ Web Portal** | Jane Jiang, Team Leader, LTIP Team, FHWA |
| **Presentations by TRB Infrastructure Committee Chairs** | |
| *Standing Committee on Pavement Condition Evaluation (AKP10)* | Gabe Cimini, Business Center Operations Leader, Stantec Consulting Services |
| *Standing Committee on Pavement Structural Testing and Evaluation (AKP40)* | Jenny Li, Section Director, Pavement Asset Management Section, Texas Department of Transportation |
| *Standing Committee on Bridge and Structures Management (AKT50)* | Anne Rearick, Director of Bridge Management, Indiana Department of Transportation |
| *Standing Committee on Bridge Preservation (AKT60)* | Michael Brown, Associate Principal, Wiss, Janney, Elstner Associates |
| **Breakout Groups** | |
| *1. Lifecycle Extension Through Preservation* | Moderators: Jason Dietz, Pavement and Materials Engineer, FHWA and Jim Nelson, Director, Bridges & Structures Bureau, Iowa Department of Transportation |
| *2. Effect of Weather and Traffic* | Moderators: Larry Wiser, Team Member, LTIP Team, FHWA and Tommy Nantung, Division of Research and Development, Indiana Department of Transportation |
| *3. Resilient Highway Infrastructure* | Moderators: Amir Golalipour, Research Civil Engineer, FHWA and Jane Lin; Professor; Department of Civil, Materials, and Environmental Engineering; University of Illinois, Chicago |
| *4. Emerging Data Sources and Data Science* | Moderators: Dave Mensching, Team Leader, Infrastructure Materials, FHWA and Nima Kargah-Ostadi, Vice President for Research, Callentis Consulting Group |
| **Breakout Groups' Reports** | |
| **Closing Remarks** | Jean Nehme, Director, Office of Infrastructure Research and Development, FHWA |

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