

## Maintenance Innovation State of the Practice

**Maintenance Innovation:** Potential Pavement Maintenance Mobile App

**Description:** State transportation agencies work to provide safe, smooth and cost-effective road pavements. As pavements age, maintenance strategy choices are crucial to ensure maintenance managers select the most appropriate and budget-friendly repair methods. Federal Highway Administration (FHWA) is seeking to maximize the accessibility of new guidance developed for asphalt and concrete pavement repairs. One potential option to reach as many users as possible is a mobile app construction workers can use on-site.



(Source: Federal Highway Administration.)

**Requester Name/Agency:** Tony Nieves, FHWA TAC Member

**Date of Request:** February 16, 2024

**Query:** To explore the interest in and need to make the new pavement maintenance guidance accessible via a mobile phone, FHWA asked No Boundaries TAC members a series of 11 primary questions involving:

- The level of interest for a Pavement Maintenance Field Guide app and potential users.
- Internet connectivity considerations.
- Functionality scope and data storage preferences.
- Security or privacy concerns.
- Desired timeline for development and deployment.

FHWA's project description and list of questions appear immediately below. A summary of member responses begins on page 3.

### **FHWA Request for Information Related to a Potential Pavement Maintenance Mobile App**

#### **Project Description**

Both state highway and local agencies are faced with increasing demands to provide a safe, smooth and cost-effective pavement network, while at the same time addressing an aging infrastructure, increasing traffic demands, and declining or restricted budgets. Due to these conditions, pavement maintenance is an important activity for managing pavement assets.

In order to provide information related to the application of cost-effective and appropriate maintenance treatments, updated guidance documents are needed to describe treatment types, project selection, design and construction activities. This document includes guidance on several pavement maintenance activities for use by state highway and local agency maintenance personnel. Pavement maintenance techniques included in this guidance document include: (1) asphalt pavement crack sealing, (2) asphalt pavement pothole repair, (3) asphalt pavement patching, (4) concrete

pavement joint resealing and crack sealing, (5) concrete pavement partial-depth repair, and (6) concrete pavement localized full-depth repair.

During the development phase, the stakeholders expressed that the [field guide] would be more useful if it was accessible via a mobile phone. The responses to the questions below will help support the interest and need in developing a mobile app for the field guide.

#### Questions for No Boundaries members:

- Is there interest in creating an app (either web-based or mobile) for the Pavement Maintenance Field Guide? This question should be answered by the users/practitioners. What would a mobile app provide that a standard e-readable document wouldn't?
- Would it make sense to build the app to provide similar functionality for other guidance documents?
  - Additional commentary:
    - The workforce at large has moved to using their phones for information and they don't read reports. We should try to meet our customers where they are.
- In addition to the app, would users require access to the field guide material via the internet?
  - Additional commentary:
    - Many field locations might not have internet access so we don't want to build in internet dependency if not used.
- Who are the target users for the mobile application? How many people do you envision downloading the app?
  - Additional commentary:
    - Construction inspection staff, construction contractor staff. If properly marketed, there could be hundreds or thousands.
- Will users be expected to have internet access when using the app? Reason for this question is that if internet access is guaranteed, a mobile optimized website may suffice.
- Would there be any security or privacy concerns associated with the information in the document?
- If functionality is requested that is user-specific, would you prefer an architecture that stores all information on the device or stored in association with an account online? Storage on device would make the information vulnerable if your device fails or you reformat. Storage online would allow access on any device.
  - Additional commentary:
    - This functionality is currently not provided. Would it be an enhancement that users would like to see?
- Would there be a need for access to user-specific information across multiple devices?
- Are there any integrations with other apps that are desired?
  - Additional commentary:
    - In the future e-ticketing apps evolve or other apps are used to develop digital as-builts, there could be linkage.
- Is offline access to the information a critical requirement for the mobile app?
- If interested, what would be the desired timeline for the development and deployment of this app?

## Summary of Responses:

Five state transportation agencies responded to this query: Caltrans, Idaho, New York, Texas and Utah. Responses are summarized below.

### Level of Interest in a Pavement Maintenance Field Guide App

- **Caltrans** is interested in a potential mobile app.
- **Texas DOT** is interested in a potential mobile app and indicated the agency piloted a similar app several years ago. The agency's "Roadrunner" app was used by maintenance supervisors to inspect, document and plan for road repair. Texas was the only state to indicate there may be security or privacy concerns associated with the information in the guidance document.
- **New York State DOT** reported possible interest in a mobile app, recognizing that while documents accessible on the agency website is good, "creating a web-based app may provide documents handy all the time," adding that implementation was not a priority.
- **Idaho DOT** reported there was not likely to be interest in a mobile app, suggesting there are sufficient resources available and project planning discussions among foremen, operations engineers and others may be more beneficial.
- **Utah DOT** responded that there was no interest in a pavement maintenance mobile app because a "standard e-readable document (PDF) should be sufficient" for maintenance instruction in the field and concerns that an app may not work in areas of low or no cell service. Despite indicating no interest in a mobile app, the Utah respondent answered additional questions, including stating a preference for implementation in the next few years.

### Potential Users

- **Caltrans** suggested potential users of a pavement maintenance mobile app would be inspectors and field staff.
- **New York State DOT** indicated highway maintenance supervisors and workers will download the app if they are asked to.
- **Utah DOT** identified state and local transportation agency personnel, contractors and private companies or owners engaged in pavement repairs as potential users.

### Internet Connectivity Considerations

**Caltrans, Texas** and **Utah DOTs** recognized the need to download documents from the app in case cell phone reception was not sufficient, reporting that offline access was a critical requirement for the app. Additional comments:

- **Caltrans** requested that the information be automatically updated once cell reception was restored.
- **Utah DOT** noted that making the app dependent on the internet would limit access in rural areas and PDFs downloaded to mobile devices should be sufficient.

**New York State DOT** did not believe offline access is a critical requirement for the app. Users would be expected to have internet access to use the app and the field guide could be accessed on the internet.

### Desired Scope and Data Storage Preferences

**Caltrans** indicated the pavement maintenance app should accommodate other documents. **New York State DOT** was not sure and **Utah DOT** noted that a PDF should be sufficient.

All agencies except **Idaho** are interested in having access to the pavement maintenance guidance across multiple devices; **Caltrans, New York** and **Texas** preferred document storage online. **Utah** noted that a PDF could be stored on a device and accessed from a website when internet was available.