

NDOT Culvert Inventory

Innovation Purpose

The number of non-bridge sized structures (less than 20 feet wide), also known as culverts, and maintenance time associated with them makes culverts a considerable asset group under the state highway system. Bridges and pavement assets have a dedicated management and inspection system, but culverts do not. Naturally occurring corrosive soils, aging infrastructure and material deterioration has caused urgent repairs that District maintenance staff respond to. Even though some culverts have reached the end of their lifespan, the state doesn't have money to replace all culverts at once. The culvert inventory will be used to prioritize culvert replacements/rehabilitation, as well as provide a tool for maintenance and engineering staff to locate culverts and determine culvert conditions. District maintenance staff can use the tool to determine location and condition of culverts, which will also help engineers and environmental staff to deliver projects on schedule. Identifying culvert conditions earlier will also reduce schedule delays during project delivery and reduce change orders and plan revisions due to addition of culverts during design and construction.

Innovation Description

The culvert inventory database is a one-stop shop that provides information about the location of a culvert and the condition of the culvert. This information is available in one location for viewing and editing as needed. Surveyors and district staff can collect data on culverts in the field with a mobile device. Within a short matter of time, it can be viewed in the office by engineers and other District staff that need information about the culvert. The culvert inventory linework will be the foundation of the database. Any future inspections on a culvert will be tied to the culvert linework in the database.

Implementation Date

November 4th, 2022

Innovation Highlights

Process Improvements

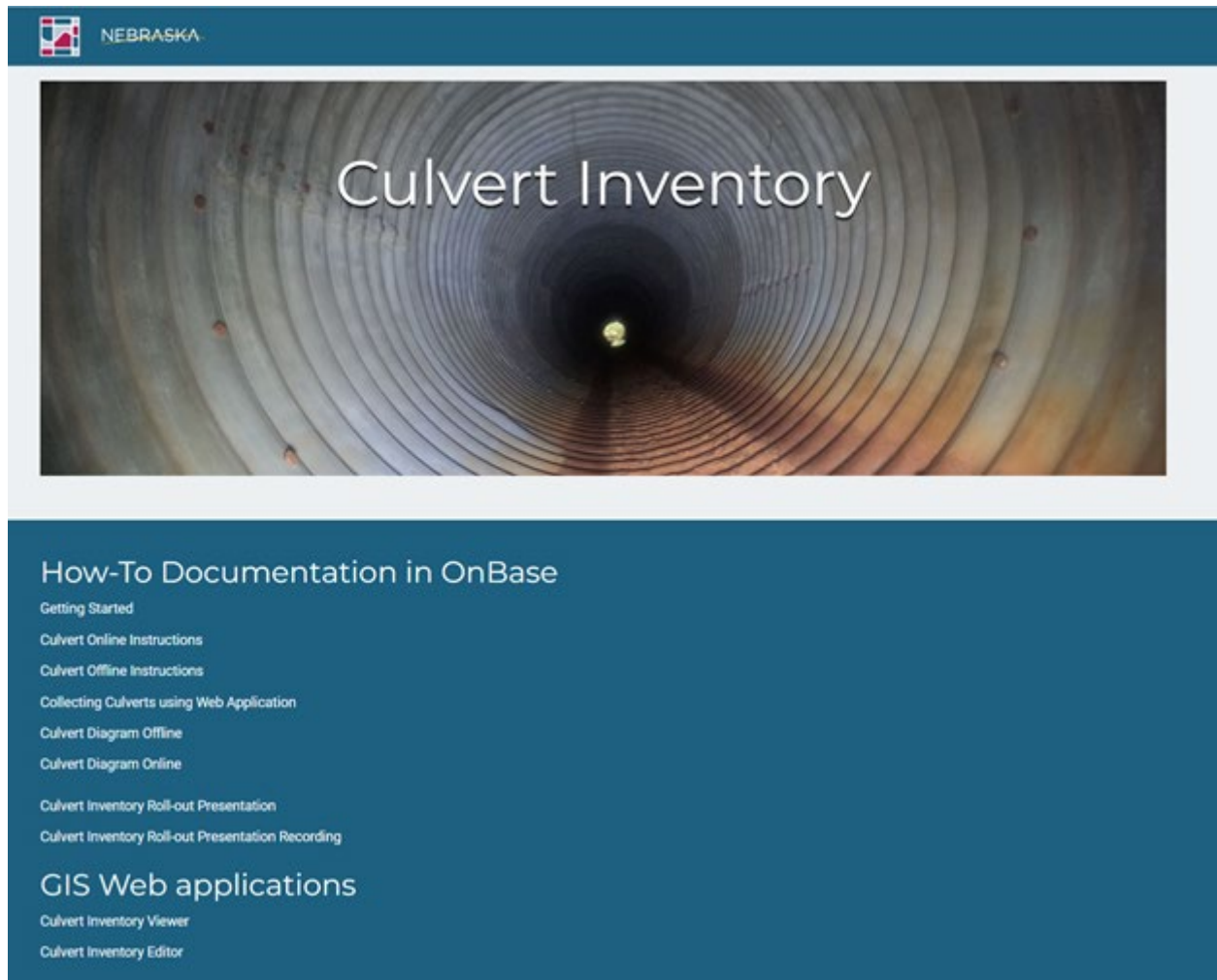
- Assists district operation and maintenance staff with prioritization of culvert needs
- Determining culvert condition prior to design assists with scoping
- Knowing the Scope assists with environmental permitting and NEPA
- Assists with planning for right-of-way needs
- Reduces the number of change orders and plan revisions due to culverts that are discovered during construction that need to be replaced
- Reduces redundancy of collecting data on paper and digitizing the information later Time Savings



- Reduces the amount of rework required for environmental permitting and NEPA due to adding culverts to a project later in the design process
- Will reduce the number of unplanned culvert replacements and rehabilitations that occur due to deteriorating culverts which reduces the costs associated with unplanned culvert replacements
- By treating culverts as an asset and prioritizing culverts that need to be replaced, they can be addressed prior to the failure of the roadway and embankment
- Provides a proactive approach to culvert asset management

Division/District

Business Technology Support, Roadway Design, District 1, District 2



The screenshot shows the Nebraska Culvert Inventory web application interface. At the top left is the Nebraska state logo and the word "NEBRASKA". Below this is a large image of a culvert tunnel with the text "Culvert Inventory" overlaid in white. Underneath the image is a dark blue navigation menu with the following items:

- How-To Documentation in OnBase
 - Getting Started
 - Culvert Online Instructions
 - Culvert Offline Instructions
 - Collecting Culverts using Web Application
 - Culvert Diagram Offline
 - Culvert Diagram Online
 - Culvert Inventory Roll-out Presentation
 - Culvert Inventory Roll-out Presentation Recording
- GIS Web applications
 - Culvert Inventory Viewer
 - Culvert Inventory Editor

