

# Bridge Division

## NDOT 2021 Strategic Communications Plan



**Mission:** Bridge Division designs bridges that are structurally and hydraulically sound and economically efficient. We ensure our existing bridge inventory is safely able to carry appropriate loads. We manage our existing bridges and make decisions on the best practical methods to preserve, repair or replace. We research new ideas and methods to improve our existing bridges, while looking to the future for more cost effective and durable bridges.

\*Bridge Division is currently in Strategic Planning Sessions to develop a new Mission/Vision statement, and possibly new performance measures. Should be complete around May 1.

## 2020 HIGHLIGHTS

We did all this while keeping on task with our regular design schedules to meet deadlines for plan submittals for NDOT's annual construction program. Including very large projects like the I-480 Bridges from 20th street to the Missouri River .

In 2019, we conducted safety inspections on roughly 1,800 state highway bridges, and Load Rated (determined the safe load carrying capacity) on over 2,500+ state and local owned bridges to assure the safety of all public road bridges in Nebraska. We also closely communicated with Nebraska counties and cities as they performed safety inspections on approximately 6,000 of their bridges. All of this work is included in our Quality Assurance (QA) program that annually helps assess progress and improve our overall NBIS program.

The Bridge Division's Interdisciplinary Scour Assessment Team (ISAT) also completed a multi-year assessment and evaluation of all bridge size structures on the National Highway System (NHS). This effort prioritized bridges from high scour risk to low scour risk. The team then performed field observations (inspections), evaluations, hydrologic and hydraulic analysis, and potential scour depths on nearly 1,500 bridges. This work effort started after discussion with FHWA in 2104. Scour assessment continue as the need arises.

The Bridge Division was integrally involved with NDOT's Transportation Asset Management Plan (TAMP) that was approved by FHWA in 2109. This required a multi-year collaborative effort with other NDOT Divisions and FHWA. The TAMP helps to explain NDOT's asset management practices and make them more transparent. The TAMP was updated in 2020

Finally, the Bridge Division was deeply involved with the development and implementation of the AASHTOWare project for construction cost estimation. This new method looks to help make NDOT's cost estimates more consistent and accurate with the actual construction cost bid by contractors doing work in Nebraska. This work is ongoing

*(cont'd. on next page)*

## 2021 GOALS

### Develop Performance Measures and stay up to date with Clarity tasks - Serve our customers

#### Tactics:

- Develop new division goals and performance measures. The Division had strategic planning sessions with HR in January and February. Implement the new goals and update performance evaluations.
- Select consultants for on-call bridge design and on-call hydraulics. Supplement NDOT in-house design with on-call consultants.
- Track uncompleted Clarity Tasks - In January 2021, there are 1343 uncompleted tasks with a finish date of 12-31-2021 or earlier (21 Clarity Task items assigned to Bridge Division). Reduce the number of uncompleted tasks.

### Communicate with; NACO, AGC, ACEC, CBMP, etc. Strong leadership during pandemic - Engage our partners

#### Tactics:

- Show strong leadership and communicate clear messages regarding COVID and work-related concerns.
- Engage with the County Bridge Match Program Working Group to continue to look for ways to improve the program. Advertise Round 6 requests for proposals.
- Communicate bridge repair strategies with NDOT DCEs to share ideas and develop common expectations for bridge construction projects.

### Look for efficiencies and cost savings - Challenge our business process

#### Tactics:

- Update the BOPP manual and write a new bridge repair section. Meetings to start mid-January and scheduled every two weeks until complete (approximately 18 months). Significant work is required between meetings to meet our completion date.
- Conduct practical design meetings quarterly to coordinate projects and look for savings.
- Submit LINC-D proposal to determine cost savings realized in the County Bridge Match Program.
- Seek Federal funds grants and programs for bridges to add Federal funds to NDOT's construction program. As an example, potential grants for the resiliency of structures, and possibly grants for developing and using new methods with Ultra High-Performance Concrete (UHPC).

### Training and work environment of Bridge Division employees and new hires - Develop our workforce

#### Tactics:

- Implement the new Onboarding Guides for Supervisors and Employees. Continue using the 6+6 training program for newly hired employees.
- Identify peer exchange opportunities (national and local), trainings and conferences to help improve the performance of the Bridge Division and meet NDOT Mission and Vision. Virtual trainings are more available, in place of in-person conferences (to minimize travel).
- Transition from remote work due to the Pandemic to permanent work schedules that include remote work. Consider remote work efficiencies while developing the new bridge office remodel layout.

## 2020 HIGHLIGHTS *(cont'd.)*

The Bridge Division continues to collaborate with the University of Nebraska for research needs. From practical research on bridge load testing and non-destructive bridge deck testing to research on Accelerated Bridge Construction (ABC) and the continued use of Ultra High Performance Concrete (UHPC).

Reviewed the impact and response to proposed rulemaking for the National Bridge Inspection Standards and Specifications for National Bridge Inspections.

Two bridges that carry the old alignment of Hwy 92 over the Platte River east of Yutan are being used as outdoor laboratories. Researchers will experiment with new methods and analysis to determine the condition and safety of bridges. Entrances to the bridges have been fenced to provide security for researchers and their equipment.

Many in Bridge Division attended events virtually due to the Pandemic. This became a benefit as more employees were able to attend virtually than would have been able to attend in person.

Bridge Division met separately with Iowa and South Dakota DOT's for the annual Border Bridges meetings to discuss our mutually owned Missouri River Bridges. Initial discussions on replacing the bridge at Decatur (with Iowa), and the bridge at Brownville (with Missouri at a separate meeting).

Bridge Division representatives are advising and collaborating with a 14-State pooled fund study for bridge deterioration modelling. Data has been collected from all states and the data screening processes are now under review as are topics about future replication to allow updates as more bridge data is collected.

Met with UNL Researchers for their final presentation on "Truck Platooning Effects on Girder Bridges". This research will help answer questions from trucking companies when they ask to platoon trucks on I-80. Platooning of trucks is when a lead truck is closely followed by multiple autonomous trucks.

81 County Bridge Match Program Round 5 proposals were submitted on December 4th by 47 counties. Included in the proposals are 137 deficient bridges, \$44.6M total estimated construction costs, and \$17.2M County Bridge Match Program funds requested. The proposals are under review and being scored now, with the announcement of \$4 M of Selected Proposals on Friday January 15, 2021.

Bridge Division has finished reviewing the final research report by UNL; To Automate Detecting, Quantifying and Mapping of Delamination of Bridge Decks using Aerial Thermographic NDE. Bridge and BTSD Divisions are working with UNL to implement the results by using NDOT owned Aerial Thermographic equipment.

## 2021 PRIORITIES

The following is the approach the Bridge Division is taking to increase project timeliness, implement the bridge communication plan, update the bridge policy and procedures manual, train current employees and new hires.

**Update/rewrite the Bridge Office Policy and Procedures (BOPP) manual.** A consultant, Benesch has been hired to help Bridge Division update our BOPP manual and add a chapter on Bridge Repair and Preservation. The update include meeting every two weeks with the BOPP Update committed and conducting review/homework between meetings. The update is expected to take about two years.

Continue to work with Program Management and Roadway Divisions to **use Clarity more efficiently.** Reach consistency in reporting completed bridge tasks in Clarity (turn in 100% of bridge construction plans in time for letting). Clarity is NDOT's main project scheduling software, but has rarely been used fully by Bridge Division personnel.

Cost savings by **implementing practical strategies (incorporating resiliency principles) for bridge preservation and construction projects.** Example: Assess the effectiveness of current practices for bridge preservation by evaluating the performance of bridge waterproofing membrane on two bridges that had some chloride exposure before receiving waterproofing membranes about 50 years ago.

Two bridges that had asphalt and waterproofing membrane on them since 1973 (47 years) had the overlay and membrane removed and the decks tested and analyzed to determine how the membrane has performed as a deck preservation treatment. One of these bridges was built in 1935 (85 years) and the original concrete deck is still in place under the asphalt and waterproofing membrane.

Vector Corrosion has completed field evaluation of two bridges that had asphalt and water proofing membrane removed that had been in place since 1973 (47 years). Site visit by Bridge Division and preliminary results from Vector indicate deck concrete has little to no deterioration. The interior parts of both bridges have been in service since 1935 (85 years). Completed analysis and report is expected in 2021.

**Identify peer exchange opportunities** (national and local), trainings and conferences to help improve the performance of the Bridge Division and meet NDOT's Mission and Vision. Continue internal training for bridge design engineers with UNL and NHI courses. Bridge Division has hosted bridge design training with UNL professors as the instructors. We need to restart this program. We also need to identify trainings and conferences that will be beneficial to our employees.

**Engage with the County Bridge Match Program Working Group** to continue to look for ways to improve the program. Advertise Round 6 requests for proposals. The 5th round selections for the CBMP were announced in January 2021. We plan to advertise for selection annually, but with the Pandemic and potentially less funds available, we are unsure what will happen with the CBMP this year.

### KEY PROJECTS

Key projects the Bridge Division will be focusing on:

- BOPP Manual update
- Load rating of state and local bridges to meet FHWA deadlines
- Scribner - West Point, CN 32302, Design
- Lincoln South Beltway, CN 12578, Construction
- Winnebago - Homer, CN 32309, Evaluation of waterproof membranes
- Fremont Southeast Beltway, CN 22722, Construction

## OPPORTUNITIES FOR INTERNAL COLLABORATION

*This section includes internal opportunities for divisions and districts to collaborate and work together to accomplish their goals.*

**Program Management and Roadway Design** – Assistance to further clarify and develop Clarity tasks assigned to Bridge Division.

**Districts and Construction Division** – Construction projects discussions during design, construction projects questions while under construction. Coordination with maintenance personnel when bridges are impacted by over height trucks, damaged by other collisions, and unexpected repairs due to accelerated deterioration.

**Materials and Research** – Material specifications for new materials, or better specs for existing materials. Research for new materials and methods.

**Project Development** – Environmental coordination during planning, design, construction and maintenance.

**BTSD** – Development of GIS maps.

## EXTERNAL COMMUNICATIONS

**Local bridge owners** – Counties, Cities – NACO, League of Municipalities

**Local bridge inspectors** – 189 currently certified

**Consultants** – Individual firms and ACEC

**Vendors** – Software, bridge preservation materials and performance analysis

**Researchers** – University of Nebraska, High Street

**Professional Organizations** – AASHTO and AASHTOWare, Midwest Bridge Preservation Program, LTAP

**Contractors** – AGC