ANNUAL REPORT

Nebraska Department of Transportation

2019

The Highway 12 bridge over the Niobrara River was completely washed out during the March 2019 flood.

Cover photo:
A temporary bridge on Highway 281 over the Niobrara River. The roadway was destroyed when the river broke the levee and dam south of Spencer in March 2019. Work continues to rebuild the bridge. See "Temporary Bridge" story on page 24.

Project Information Links:
https://dot.nebraska.gov/projects/
https://dot.nebraska.gov/projects/publications/

NDOT videos on YouTube:
https://www.youtube.com/c/NebraskaDepartmentOfTransportation

Kyle Schneweis

FROM THE DIRECTOR

Widespread flooding during March 2019 caused unprecedented damage to roads and bridges throughout much of Nebraska. Recovery efforts dominated the activity of the Nebraska Department of Transportation, and that of our state and local government and industry partners, throughout the year. While flood-related activities dominated NDOT's efforts, they did not preclude other important work. Our 2019 Annual Report highlights accomplishments that impact how Nebraska's transportation needs are being met, now and into the future.

The accomplishments, both flood-related and otherwise, are a tribute to the staff of NDOT. During flood recovery efforts, hundreds worked tirelessly – many days without a break – in difficult and sometimes dangerous conditions. Others kept the rest of the work moving forward. On behalf of the NDOT leadership, I offer them our deep gratitude and high respect.

As we resume more normal activities, our focus is on continuous improvement of our business practices to provide better customer service. The improvements range from innovative funding to accelerate completion of the Lincoln South Beltway to reducing completion time on other projects through NEPA assumption. The Main Street Project in Valentine is an example of our increasing engagement with Nebraska communities. In 2019, we collaborated with the Department of Administrative Services to implement the use of purchasing cards by employees in the field to pay local vendors quicker for supplies and equipment. We are pursuing the inclusion of lane rental provisions in highway project contracting to reduce highway lane closures for the traveling public.

The NDOT Annual Report is organized around our eight strategic goals: Safety; Fiscal Responsibility; Environmental Stewardship; Project Delivery; Asset Management; Mobility; Communication, Coordination, Collaboration & Cooperation; and Workforce Development. Throughout the report, please note our numerous performance measures that account for the outcome of our efforts. The many articles provide further insight into our work. As you learn more, we hope that you will come away confident that Nebraskans' investment in NDOT is yielding a strong return.

Rebuilding Nebraska's Infrastructure

NDOT's Response to the Historic Flooding of 2019

The six months between September 2018 and March 2019 comprised Nebraska's fifth wettest year in 124 years. Winter Storm Ulmer, a bomb cyclone equivalent to a Category 2 hurricane, hit mid-March and brought blizzard conditions and flooding that closed over a third of the state's 10,000 miles of highway.

As the water rose, NDOT personnel sprung to action, closing highways, detouring traffic and getting to work on emergency repairs. Their efforts were nothing short of heroic. District staff encountered it all those first few weeks. From plowing through ice jams and towing vehicles through dangerous flood waters to chain sawing tree limbs in a downpour, crews worked together to secure roads and keep communities safe. Ultimately, NDOT would be charged with managing over $200 million in damages on 200 miles of pavement and 27 bridges. Not a feat that could be handled alone. The NDOT leaned heavily on its contracting and consulting partners and the Federal Highway Administration in order to quickly and efficiently navigate recovery operations.

Throughout 2019, NDOT worked alongside industry partners to design, repair and rebuild the state's infrastructure to get Nebraska moving again. NDOT made it a priority to keep communities and the public informed of progress and aware of challenges. With Nebraska's leading economic drivers being agriculture, manufacturing and tourism, the transportation network is vital to the stability of the state. NDOT recognized this and utilized innovation and leveraged relationships to open 99 percent of closed highways within 30 days to reestablish mobility, connect communities and support economic vitality.

The initial response lasted days while the recovery operations and support are ongoing. NDOT continues to work with local counties to reimburse construction costs and the permanent repairs to bridges over Highway 281 and Highway 12 are expected to be completed in late 2020. These two recovery projects comprise some of the most complex work NDOT has taken on. Overall, in 2019, the NDOT managed over 80 emergency relief projects along with its traditional construction program.

Within 30 days, 99 percent of closed highways were reopened and NDOT was able to reestablish mobility, connect communities and support economic vitality.

Over one-third of highways closed

Approximately 200 miles of pavement repairs

27 washed out or damaged bridges

Sustained $200M in damages to the state and local federal routes

Over 20 community engagement events

90% of counties received Presidential Disaster Declarations

99% of highways open within 30 days

100% mobility restored within nine months

SAFETY

Improve Safety on Nebraska's Transportation System

"Toward Zero Deaths" are three key words in the department's overall safety goal to reduce deaths and injuries on Nebraska's roadways. Topping the list of performance measures, safety is integrated into every aspect of roadway construction and maintenance, as well as non-infrastructure projects. The department continues to focus on identifying and prioritizing projects to address safety concerns such as roadway departures, intersection safety, occupant restraint and distracted driving crashes. New technologies are being implemented such as bridge anti-icing systems, improved winter operations and the "beveled edge" to aid in vehicle re-entry onto the highway after a roadway departure. The department is also implementing low-cost, effective countermeasures, such as centerline and edge line rumble strips and warning signs for statewide projects.

Year	Nebraska Fatalities
2010	190
2011	181
2012	212
2013	211
2014	225
2015	246
2016	218
2017	228
2018	230
2019	248

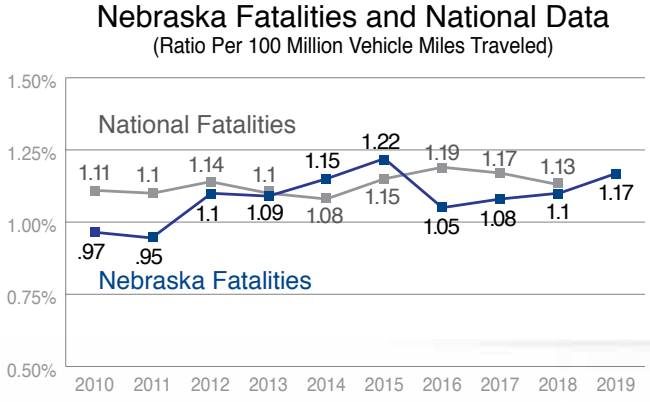
Fatalities on Nebraska Roadways

Description: Measurement of fatalities on Nebraska's roadways: the Interstate, state highways, and local roads and streets.

Purpose: To heighten the awareness of safety and driving responsibility on Nebraska roadways. A consistent decline in fatalities reflects improved safety management practices, greater public awareness of safe driving practices, and will reduce statewide societal costs.

Goal: To reduce fatalities, their number and the rate, to a ratio of 0.9 fatalities per 100 million vehicle miles traveled by 2021.

Outcome: Nebraska's rate of fatalities per hundred million miles traveled in 2019 was 1.17. There were 248 fatalities in 2019, an increase of 18 compared to 2018.



Serious Injury Crashes on Nebraska Roadways

Description: Measurement of serious injury (Type A[1]) crashes on Nebraska roadways; the Interstate, state highways, and local roads and streets.

[1] Type "A" Injury: Disabling injuries - cannot leave the scene without assistance.

Purpose: To heighten the awareness of safety and driving responsibility on Nebraska roadways. Improved safety management practices and greater public awareness of safe driving practices contributed to a consistent decline in serious injury crashes. Continuation of these practices will reduce statewide societal costs.

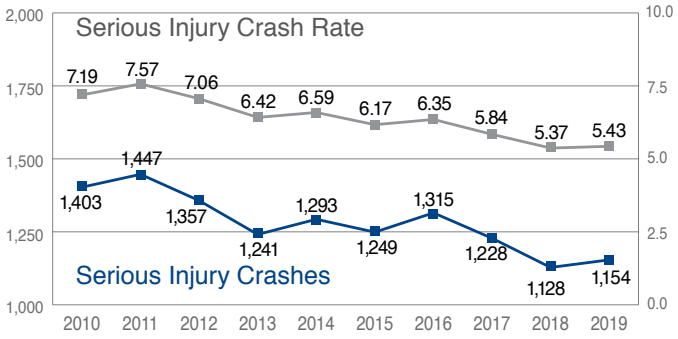
Goal: To reduce serious injury crashes in Nebraska to a ratio of 5.5 per 100 million vehicle miles traveled by 2021.

Outcome: Nebraska's serious injury crash rate in 2019 was 5.43.

Year	Annual Vehicle Miles Traveled (AVMT)
2010	19,520,000,000
2011	19,111,177,000
2012	19,224,041,000
2013	19,323,263,000
2014	19,612,000,000
2015	20,230,000,000
2016	20,709,000,000
2017	21,011,000,000
2018	20,995,826,000
2019	21,261,959,000

Serious Injury Crashes on Nebraska Roadways

(Ratio Per 100 Million Vehicle Miles Traveled)



FEATURED STRATEGY

Nebraska's First RCUT Intersection

The first Restricted Crossing U-Turn, or RCUT, in Nebraska, is being built at the intersection of US-81 and N-91, near Humphrey, in Platte County, beginning in July 2020. The RCUT is being built to reduce right-angle crashes and reduce delay at the intersection during peak traffic periods. While new to Nebraska, RCUTs have been shown to increase intersection safety in states where they have been in place for several years.

US-81 is a four-lane divided highway through this intersection and N-91 is a two-lane highway. Currently, motorists approaching the intersection from any direction may turn left, go straight, or turn right. An RCUT will change the way drivers on the two-lane highway navigate crossing or turning left onto US-81.

At an RCUT intersection, motorists approaching a divided highway (US-81) from a side road (N-91) are not allowed to make left turns or drive straight through the intersection. Instead, they must turn right onto the highway (US-81), then make a U-turn at a designated median opening. Not only does this reduce the possibility of right-angle crashes, it also reduces delays caused by waiting for a gap to cross all four lanes of traffic at the intersection.

RCUT intersections have been found to significantly reduce the potential for crashes by allowing drivers to navigate through one direction of highway traffic at a time. Currently, drivers on N-91 must wait for a gap in both directions of highway traffic at the same time in order to safely cross the highway. An RCUT allows the driver to wait for a gap in only one direction of traffic, making it not only safer, but also quicker to turn left or cross the highway during peak traffic periods.

Instead of constructing a more expensive, grade-separated interchange at a highway intersection, an RCUT is an innovative solution that addresses safety issues at a greatly reduced cost and greatly reduced construction time.

Motor Vehicle Crashes on Nebraska Roadways

Description: Measurement of motor vehicle crashes on Nebraska roadways, the Interstate, state highways, and local roads and streets.

Purpose: To heighten the awareness of safety and driving responsibility on Nebraska roadways. A consistent decline in crashes reflects improved safety management practices, greater public awareness of safe driving practices, and will reduce the statewide societal costs.

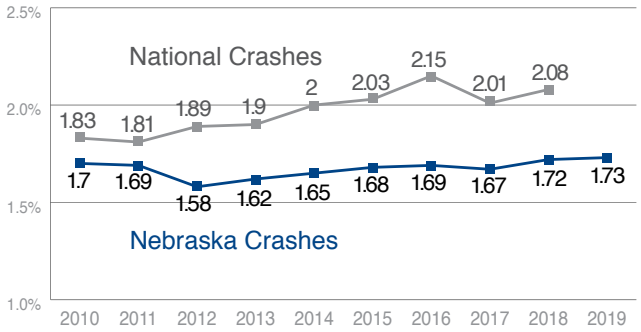
Goal: To reduce motor vehicle crashes in Nebraska to a ratio of 5.5 per million vehicle miles traveled by 2021.

Outcome: Nebraska's crash rate has been below the national rate since 2004. Beginning in 2013, the number of crashes has increased steadily, but the ratio of crashes to one million vehicle miles traveled remained under 1.7 until 2018, when it went slightly over 1.7 and remained there in 2019.

Year	Nebraska Crashes
2010	33,212
2011	32,302
2012	30,443
2013	31,377
2014	32,318
2015	33,988
2016	34,890
2017	34,999
2018	36,117
2019	36,706

Toward Zero Deaths

Nebraska Crashes and National Data
(Ratio Per Million Vehicle Miles Traveled)



FEATURED STRATEGY

Nebraska's Transportation Systems Management and Operations (TSMO) Council

The Motorist Assist Program has been around for over a decade, helping stranded drivers get back on the road. Operators assist with common issues such as a jump start, overheated engine, or changing a flat tire. The program has been successful as the traveling public receives service with a smile from the faithful volunteers that staff this program.

Mobility and safety require quick clearance of any deviation from normal traffic flow. When an incident occurs, identification, dispatch and coordination among services is crucial. As traffic increases, so does the need for these services, and NDOT will soon invest in a contract to fully staff a dedicated program to not only assist stranded motorists, but also provide traffic control for incidents.

Moving the Motorist Assist service from a volunteer activity to a full-time staffed program is one of several efforts of Nebraska's Transportation Systems Management and Operations (TSMO) Council. TSMO is a set of strategies to anticipate and manage traffic congestion and minimize the other unpredictable causes of service disruption, delay and crashes. Besides the Motorist Assist Program, TSMO also includes Traffic Incident Management, Freight Management, Traveler Information, Integrated Corridor Management and Connected/Autonomous/Automated Vehicle Deployments.

Directed by senior administrators in Operations, Traffic Engineering, Roadway Design and District Management, the Council is also pursuing other advances:

- Hired a consultant to develop a TSMO Strataegic Plan.
- Established a contract with a vendor to continue 511 website and phone services.
- Oversaw completion of in-house support for the Intelligent Roadway Information Service (IRIS), adapted from Minnesota's DOT.
- Selected a contractor to continue facilitating the statewide Traffic Incident Management (TIM) program.
- Committed to the use of Dedicated Short-Range Radio Communication (DSRC), to leverage Connected Autonomous Vehicles (CAVs) to improve safety.

SAFETY HIGHLIGHT

Keeping Children Safe in Motor Vehicles

The safety of children in vehicles is a concern at the forefront of every parent's mind. NDOT realizes education of proper seating location and proper use of restraint systems is critical to achieving this protection.

New Child Safety Legislation

On January 1, 2019, legislation that seeks to enhance child passenger safety was implemented in Nebraska. LB42 increased the age requirement for child passenger safety restraints and specified other restrictions to protect children in the event of a crash.

Child Safety Promotions

The NDOT Highway Safety Office (HSO) uses printed, earned and electronic media to educate the public and encourage proper restraint of children in motor vehicles. The NDOT website provides extensive information and campaign tool-kits, such as the "Get Seat-iated" campaign, to remind the public, and especially parents, caregivers and guardians of the new law. The website also provides best practices for child safety seats, the need to use car safety systems (seat belts, booster seats and child safety seats) and access to car seat check events.

Child Passenger Safety Technicians

To assure that parents and other caregivers install and use child passenger restraint equipment properly, the HSO trains Child Passenger Safety Technicians throughout Nebraska. Training is provided to law enforcement officers, nurses, school bus drivers, community health educators, child care providers, parents, car dealership staff, and others that work with or provide information about child safety seats. Certification is obtained through Safe Kids Worldwide. Recertification is required every two years, meeting certified education units (5) and seat sign-off.

Child Safety Seat Check Events

Check Events are set up in public areas such as shopping center parking lots. Parents and caregivers bring their child's safety seat, motor vehicle, and child to the event. Trained Child Passenger Safety Technicians perform an evaluation for all children in the vehicle who are under 13 years old.

The HSO supports inspection stations across the state. These stations provide parents with access to information and assistance on the proper use of child safety seats, at the local level. Unlike "Check Events," the nearly 20 inspection stations, located across the state, are permanent locations. Inspection stations provide assistance through regularly scheduled events and by appointment.

In Nebraska, child safety seat use is surveyed annually through observations conducted in rural and urban counties. Among the children observed in the 2018 study, 97.4% were riding in child safety seats/booster seats. This rate is comparable to the rates for the last few years and is significantly higher than the rate observed when this series of surveys began in 1999 (56.2%).

Child Safety Legislation

Major changes in the law:

- All children up to age eight must ride correctly secured in a federally-approved child safety seat. The previous age limit was six.
- Children must ride rear-facing up to age two or until they reach the upper weight or height limit allowed by the car seat's manufacturer.
- Children under age eight must ride in the back seat, as long as there is a back seat equipped with a seatbelt that is not already occupied by other children under eight years of age.

Provisions still in force:

- Children ages eight to eighteen must ride secured in a safety belt or child safety seat (booster seat).
- Child care providers must transport all children securely in an appropriate federally-approved child safety seat or safety belt.
- Children up to age eighteen are prohibited from riding in cargo areas.
- A violation carries a $25 fine plus court costs.

FISCAL RESPONSIBILITY

Use Financial Resources Wisely and Make Financial Decisions in an Open and Transparent Way

Fiscal Responsibility is defined as (1) living within our means; (2) using financial resources wisely, and (3) making financial decisions in an open and transparent way. The goal is to optimize the use of available funds to build and maintain the state's transportation system. These measures have been established to reflect the progress toward meeting this goal.

Overhead as a Percentage of Annual Expenditures

Description: Measurement of the department's costs for construction, maintenance and overhead.

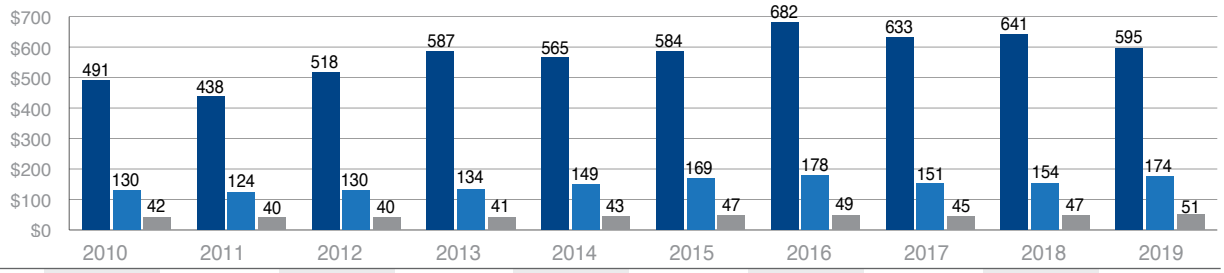
Purpose: To maximize funding for transportation purposes by minimizing overhead costs.

Goal: To have overhead costs less than 10% of annual expenditures.

Outcome: The department has maintained overhead at less than 10% of annual expenditures over the ten-year period. The overhead for 2019 was 6%.

Transportation and Administrative Expenditures

(Dollar amounts represented in millions)



	2010		2011		2012		2013		2014		2015		2016		2017		2018		2019	
Construction	491	74%	438	73%	518	75%	587	77%	565	75%	584	73%	682	75%	633	76%	641	76%	595	73%
Maintenance	130	20%	124	21%	130	19%	134	18%	149	20%	169	21%	178	20%	151	18%	154	18%	174	21%
Subtotal	$621	94%	$562	93%	$648	94%	$720	95%	$714	94%	753	94%	860	95%	784	95%	795	94%	769	94%
Overhead	42	6%	40	7%	40	6%	41	5%	43	6%	47	6%	49	5%	45	5%	47	6%	51	6%
Total Costs	$663		$602		$688		$762		$757		$800		$909		$829		$842		$820	

Accuracy of Project Estimates Contained in the 1-Year Program

Description: Measure the difference between the projected construction project estimates and the actual awarded contract amounts.

Purpose: Accurately projecting annual construction expenses helps NDOT forecast when future construction projects can be built. NDOT values the important role that reliable project estimating plays in supporting local communities by keeping the highway system in a state of good repair.

Goal: To be within 5% of the total estimated cost of the published program as reported in the 1-Year Program.

Outcome: The goal has been met nine out of the last ten years.

Actual and Estimated 1-Year Program Project Cost

Fiscal Year	Projects in 1-Year Program	1-Year Program Estimate	Fiscal Year-End Total Project Cost	Over/Under Program Estimate	Over/ Under
2010	160	$387,770,000	$389,302,000	$1,532,000	0%
2011	144	$407,556,000	$400,925,000	($6,631,000)	-2%
2012	142	$333,466,000	$342,528,000	$9,062,000	3%
2013	135	$380,732,000	$376,220,000	($4,512,000)	-1%
2014	152	$466,460,000	$446,529,000	($19,931,000)	-4%
2015	153	$447,786,000	$501,012,000	$53,226,000	12%
2016	110	$453,412,000	$467,351,000	$13,939,000	3%
2017	95	$506,168,000	$498,937,000	($7,231,000)	-1%
2018	100	$483,240,000	$482,144,000	($1,096,000)	-.2%
2019	110	$512,666,000	$519,813,000	$7,147,000	1%

FEATURED STRATEGY

The Multi-Service Request For Qualifications

The Multi-Service Request for Qualifications (RFQ) is a strategy NDOT has used the last three years to contract out highway construction projects under a single contracting effort. Once a year, NDOT releases much of its project work needing to be accomplished using consultant services. The Multi-Service RFQ replaces the practice of individual divisions contracting services, which typically resulted in multiple contracts and multiple consultants delivering the same project.

In theory, the RFQ is more efficient because it results in having a single firm managing the services and the Department has more assurance that the project schedule and deliverables will remain aligned. The goal of the effort is streamlined communication and more effective project management, especially from the consultant's side. The selected firm establishes its own team (which could include sub-consultants), so that NDOT isn't forcing consultant relationships as before.

According to Project Development Division Head Brandie Neemann, "Our consultant firms have told us that if they need to find an additional consultant for a project, they prefer to find and manage it themselves. They prefer assembling their own teams. Theoretically, all schedules become more reliable with one consultant managing all of the services needed."

The divisions that participate in developing the Multi-Service RFQ include Program Management, Project Development, Right of Way, Roadway Design and Bridge. They begin meeting in late fall to discuss and collaborate to determine the best candidate projects to include in the Multi-Service RFQ. Once identified, the projects are grouped by criteria such as location, schedule needs, and services needed for publication. The RFQ is typically released in February in order to have environmental services under contract by May, in time for the growing season, and to contract for other services that need to get underway first.

"The theory of the Multi-Service RFQ is spot-on," Neemann emphasizes. "The practice is still being refined, but improving every year. It will always be more effective to have one consultant responsible for ensuring that their projects are managed efficiently and are delivered on time. It worked really well this year, and although it is a huge undertaking to develop the contracts all at one time, the results are worth it."

Construction Competitiveness

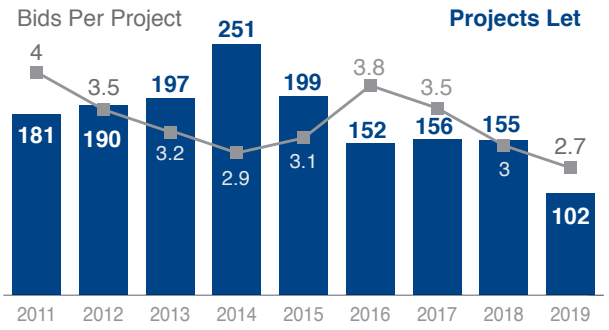
Description: Measurement of the number of projects let in a calendar year and the average number of bids that the department receives on those projects.

Purpose: Measure the number of projects let to construction in a calendar year and measure the average competition among the industry players for that calendar year's projects.

Goal: Maintain a minimum average of three bidders over a calendar year.

Outcome: The minimum average of three bidders over a calendar year has been met in eight of the last nine years.

Number of Projects Let Per Year and Average Number of Bids Per Project



The significant cost and contractor effort expended in response to the 2019 Governor declared flooding disasters resulted in a lower number of programmed contracts awarded in 2019, as well as a lower number of available bidders for those contracts. In addition to the 100 projects let to bid, there were 49 force account agreements for flood repair that were executed by the Districts and Central Complex staff.

FEATURED STRATEGY

OpenGov Provides Improved Options for Decision Makers

Shortly after Chief Financial Officer Lyn Heaton arrived at NDOT in 2018, he was presented with a new software option for NDOT's internal budget development and administration. The product is called "OpenGov" and was already being evaluated by NDOT to use for other functions, such as citizen engagement and operational performance reporting.

Heaton, along with Controller Division staff, began exploring the budget and financial reporting features offered by OpenGov, including data availability and reporting configuration options that didn't require assistance from IT staff. The visualizations offered were also key factors in deciding to use OpenGov.

Adoption of the new system was complicated and its various aspects were put in place throughout 2019 and into 2020. Steps included setting up NDOT's chart of accounts and configuring financial data integration, both budget amounts and actual expenditures.

Completion of financial data integration into the platform in 2019 allowed for development of personalized dashboards for agency leadership, division heads and district engineers. The financial integration provides a daily update of financial data, giving decision makers the most up-to-date financial information possible. The development of OpenGov's Budgeting and Planning module – the internal budget system used by divisions and districts to propose budget amounts and adjustments – was completed in 2020.

Developing training materials for NDOT division heads and district engineers, who are primary users of the system, was essential for system acceptance. Detailed PowerPoint presentations were prepared to use for training, which are detailed enough to also be ongoing user manuals.

The system uses both dashboards and tabular information for budget development and management. Managers can easily calculate and evaluate, within the system, the impact of budget changes or changes in actual expenditures. They can also save time by attaching supporting spreadsheets or other documents to the system during budget development.

The new system will be used to develop the FY21 budget review and the FY22/FY23 biennium budget proposal. According to Heaton, "Financial responsibility is a priority for NDOT. We want to make sure decision makers have the information they need to make informed decisions. We believe OpenGov will help and are happy to have worked to make it available."

FISCAL RESPONSIBILITY HIGHLIGHT

District 7 Purchasing Card Project

NDOT staff throughout the state often need to purchase parts, supplies and other items from local businesses. The Nebraska Department of Administrative Services (DAS) maintains a purchase order process that assures proper expenditure of state funds. NDOT staff and local vendors, however, often found the process cumbersome and time-consuming. In 2019, NDOT collaborated with DAS in a pilot project that allowed certain NDOT District 7 (southwest Nebraska) employees to use purchasing cards to pay local vendors quicker for supplies and equipment. Below is District 7 Engineer Kurt Vosburg's documentation of the project as it proceeded to a successful outcome.

January 2019 – *Administrative Assistant Jan Collins and Staff Assistant Maggie Repass assisted with a process improvement project looking into the State Purchasing Card/Invoicing Process. The current process is time consuming for NDOT staff and delays payments to vendors. This has been exacerbated with the increased number of vendor contracts and current policy preventing the use of a purchasing card at vendors where a contract is in place. LSS staff is also surveying vendors in District 7 to gather their input.*

February 2019 – *Jan Collins and Maggie Repass returned optimistic from the February Purchasing Card Process Kaizen event. Pending DAS approval, District 7 will begin a pilot project in March to test the use of state purchasing cards for items under contract at vendors. The initial pilot project will involve a small group of mechanics and be limited to purchases under $200.*

March 2019 – *The pilot project was placed on hold. DAS asked the State Auditor to review the proposal before granting approval. Am hopeful to continue this project, as it is expected to save a large amount of staff time and reduce vendor payment delays, but could be a huge LSS win in the districts.*

April 2019 – *The pilot project is moving forward. NDOT/DAS signed a memorandum of understanding. District 7 will pilot this from May 1 through July 31.*

June 2019 – *Received permission from DAS to expand our pilot program to include all purchasing card users in District 7 during July and August. We will continue to track time to process payments and demonstrate that we can consistently identify items under contract purchased with the card to meet reporting requirements. Initial results are very positive with vendors paid immediately and NDOT staff time-savings of 8-12 minutes per invoice paid.*

September 2019 – *From May through August, over 22 hours of staff time was saved. Considering the very small number of users (3) during the initial two months of the pilot, this is extraordinary. With all District 7 cardholders included, 13 hours and 32 minutes was saved in August alone. On average, time to process invoices was reduced from 9 minutes (E1/RPS system) to 1 minute, 54 seconds (purchasing card). This should be expanded agency-wide and the purchasing limit raised to match the card limit.*

January 2020 – *In November, the pilot was expanded Department-wide with District 7 Staff Assistant Maggie Repass compiling time-savings being tracked by all Districts and the Operations Division. Results from the study continued to be very positive. Based on the data submitted in early January, DAS has agreed the case has been proven and the time-savings exercise may be discontinued.*

ENVIRONMENTAL STEWARDSHIP

Integrate Environmental Considerations into Planning/Design, Construction, and Operational Activities of Nebraska's Transportation System

Environmental Stewardship is the integration of environmental considerations into the planning, design, construction and operational activities associated with the Nebraska transportation system. These environmental considerations include cultural, natural and human elements. The department is committed to its role as an environmental steward and to preserving and protecting the environmental features and resources of the state. This goal emphasizes that transportation decisions and investments must be balanced with environmental considerations. The performance measures linked to this strategic goal illustrate our promise to carry environmental commitments forward into construction, take swift corrective action to benefit the environment, when necessary, and to encourage an environmentally sustainable transportation system.

Environmental Commitments in Compliance

Description: A key component of the department's environmental stewardship goal is to ensure that environmental commitments for construction projects, documented through the National Environmental Policy Act (NEPA) and permitting processes, are being managed. This entails periodic site inspections to ensure that these commitments are being upheld during construction.

Purpose: To ensure that the department is following through with our promises made to the public and to the environmental agencies, we track compliance with commitments and the information necessary to deliver appropriate environmental training to staff and contractors.

Goal: 100% of the environmental commitments are in compliance.

Outcome: This performance measure reports data for projects from January through December.

For 2019, 99.9% of environmental commitments were in compliance.

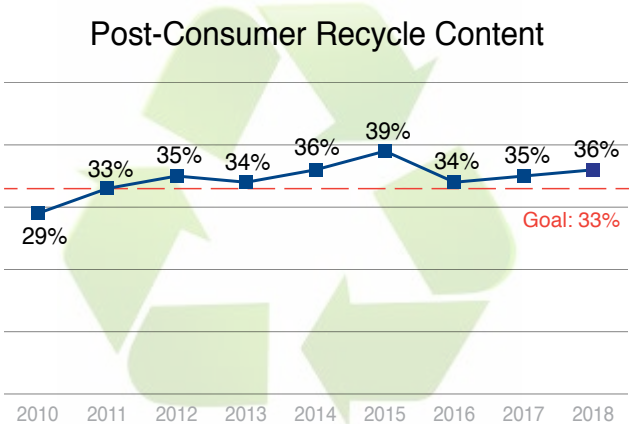
Paving It Forward

Description: Measurement of material removed during highway construction or maintenance work that is available for reuse.

Purpose: To ensure that the department is striving to maximize the use of removed or salvaged material. This minimizes the use of virgin materials and keeps reclaimed material out of landfills.

Goal: A minimum of 33% overall replacement content.

Outcome: This content has trended upward, from 29% in 2010 to 36% in 2018, down slightly from a high of 39% in 2015, but still exceeds the goal. Post-consumer recycle content of 18% on concrete projects and 45% for asphalt projects was reported in 2018.



Post-Consumer Recycle Content

Year	Overall Replacement Content: Raw Materials (tons)	Overall Replacement Content: Recycle Content Raw Materials (tons)	Est. Value Recycled
2010	3,270,654	942,679	$34,563,117
2011	3,180,801	1,055,865	$49,834,191
2012	3,477,232	1,210,614	$53,066,480
2013	3,714,339	1,250,167	$53,215,809
2014	3,796,902	1,350,476	$59,292,024
2015	3,215,669	1,246,427	$45,750,906
2016	3,717,875	1,250,980	$47,568,953
2017	4,346,961	1,534,604	$60,233,179
2018	2,993,035	1,088,647	$49,670,595

FEATURED STRATEGY

Using Binder Pods and Green Rejuvenators to Improve Maintenance Patching

A portable small batch asphalt recycling machine uses NDOT's new binder pods to produce 100% recycled high-performance hot mix patch material that includes millings, binder and special additives. The new binder pods resulted from the department's efforts to find a cost-effective way to produce high performance hot mix patch material year-round.

Typically, during the winter, when hot mix asphalt plants do not operate, maintenance workers apply a temporary cold mix patch that typically needs to be repatched until hot mix is readily available for permanent patching in the spring and summer.

The initial research binder pods were made from leftover binder samples that have been tested in the NDOT Binder Rheology Laboratory. The pods weigh six to eight pounds each and are available at no cost to NDOT. The industry now produces a similar product that can be purchased in bulk, but without the special performance additives. These additives help soften the binder in the millings and improve other rheological properties (adhesion, cohesion, flexibility, and flow). These are green technology additives/rejuvenators and are added to the mix.

The new process has several advantages. The patch material works in all potholes, large or small, in every pavement type, concrete or asphalt, at a cost that is approximately one-fifth the cost of other patching materials. Overall, it is expected to save the department a minimum of $200,000 per year in material and labor costs. It is also expected to be well received by the traveling public, because patches will be permanent and not have to be repatched, improving safety and reducing wear and tear on vehicles.

A demonstration of the improved maintenance patching process can be seen at: https://www.youtube.com/watch?v=ykhEdG5d7tA

Problem-Solving Swiftly

Description: This important component of the department's environmental stewardship goal is to ensure that corrective actions related to environmental commitments for construction projects are resolved within a seven-day window. Speed of resolution is key to maintaining compliance.

Purpose: To ensure that the department is performing timely corrective actions and tracking the compliance information necessary to deliver appropriate environmental training to staff and contractors.

Goal: 100% of corrective actions completed within seven days.

Outcome: In 2019, 71% of corrective actions were completed within seven days and 99% were completed within 30 days.

FEATURED STRATEGY

Update on NDOT's Categorical Exclusion (CE) Assignment Program

During the worst flood response event in Nebraska history, the Federal Highway Administration (FHWA) and NDOT conducted the first monitoring of NDOT's Categorical Exclusion (CE) Assignment Program under 23 CFR 326. Categorical exclusions are a category of actions that do not have a significant effect on the human environment and which, therefore, do not require an environmental assessment nor an environmental impact statement. Under the assignment program, NDOT has assumed environmental review responsibilities for federally funded Categorical Exclusion transportation projects in Nebraska.

Approximately 90% of Nebraska's federally funded projects are reviewed and approved by NDOT's CE Assignment Program. After FHWA's review of NDOT's CE program project file and personal interviews with various NDOT staff, stakeholders and Environmental Resource agencies, FHWA found that NDOT's program was "in compliance" with the 23 CFR 326 Memorandum of Understanding (MOU) that was signed on September 5, 2018. The FHWA review team identified many processes and procedures that were efficient and effective, even mentioning several that they would like to see brought to other NEPA Assignment states. The FHWA review team also made note of several processes and procedures that were compliant, but made recommendations for modifications that may result in further efficiencies for the program should NDOT choose to adopt them.

ENVIRONMENTAL STEWARDSHIP HIGHLIGHT

Relocation of DAR Monument for Construction of Lincoln South Beltway

As one of the first Lincoln South Beltway construction activities, NDOT successfully relocated the Daughters of the American Revolution (DAR) Territorial Road Monument. The monument marked the location ("near this spot") where the Nebraska City to Fort Kearny Road, established by Act of the Territorial Legislature in 1861, crossed Lancaster County. The Territorial Road, part of the Oregon Trail system, was known by various names and is described on the dedication plaque as being the "The Great Central Route to the Gold Fields."

The monument relocation was coordinated by NDOT Environmental and Legal staff, but the heavy lifting was done by the NDOT Salt Valley Yard maintenance staff. NDOT coordinated with the DAR St. Ledger Chapter and the City of Lincoln to find a new home for the monument that needed to be moved due to construction of the new Lincoln South Beltway west system interchange that will connect the South Beltway to existing U.S. Highway 77, carrying beltway traffic north toward Interstate 80. The monument found a new home at the Jamaica North Trailhead access area located approximately three-quarters of a mile to the east, just off Saltillo Road in Wilderness Park.

The building of that original Great Central Route, which had "every stream bridged, no fords or ferries," was a major accomplishment when Nebraska was not yet even a state, as the South Beltway will be for the 21st century. It's interesting to consider the differences of the two major accomplishments: The pace of travel would have been much slower, dirty, rough and exposed; yet the Great Central Route was a massive improvement over previous options. Both were/will be milestone achievements when complete; and while they are vastly different in their physical presence, they still occupy portions of the same footprint while accomplishing the goal of improving interstate transportation efficiency.

The DAR Monument, consisting of a one-ton boulder and commemorative plaque, was originally erected by the Daughters of the American Revolution St. Ledger Cowley Chapter, and was dedicated on November 11, 1934. The monument was located under two pine trees south of the intersection of South 14th Street and Saltillo Road near Major Oil.

PROJECT DELIVERY

Use Known State and Industry Best Practices, New Technologies and Creativity to Continually Improve and Deliver Well-Designed, High-Quality Projects, Products and Services

The department's goal is to continuously improve project delivery. Project delivery refers to the steps taken to progressively develop plans that define how each highway project will be built. Project delivery teams are responsible for developing these plans and must predict, minimize or prevent negative impacts to the environment, project costs and construction schedules for stakeholders.

The department strives to:

- Continuously enhance our expertise in laws and regulations that affect highway projects
- Lead efforts to streamline complex processes
- Implement creative, efficient and flexible solutions to expedite project delivery and construction

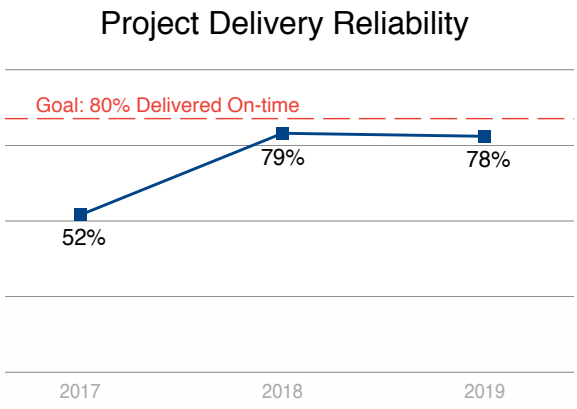
Project Reliability

Description: Measurement of the department's reliability in delivering construction projects in the one-year construction program to letting on time.

Purpose: This measurement reflects how accurately NDOT predicted in advance, which letting each project would be advertised in during the upcoming year.

Goal: To deliver 80% of projects on time.

Outcome: This measurement began in 2017, when 52% of projects were on time. NDOT has implemented many changes to improve reliability. By FY-2019, reliability has increased to 78% of projects delivered on time.



1-Year Program Projects Delivered to Letting

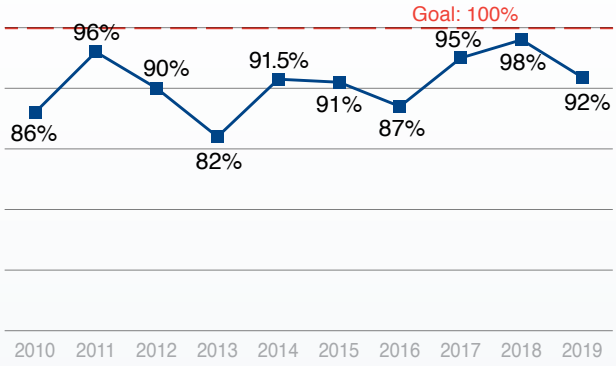
Description: Measurement of the ability to let projects which are identified in the department's one-year schedule of highway improvement projects (1-Year Program).

Purpose: This measurement monitors the delivery of projects to the public. Our performance reflects how well we keep our promises to the public.

Goal: To deliver 100% of projects.

Outcome: 92% of projects identified in the department's one-year schedule of highway improvement projects were delivered to letting in 2019, compared to 98% in 2018.

Percent of Projects
Delivered in the 1-Year Program



Fiscal Year	1-Year Projects[1]	Projects Delivered
2010	160	138
2011	144	138
2012	142	128
2013	135	111
2014	152	139
2015	153	139
2016	110	96
2017	95	90
2018	100	98
2019	110	101

[1] *Projects from the Nebraska Surface Transportation Program not included are those counted in the previous fiscal year, projects withdrawn, and projects built by entities other than the State of Nebraska.*

5-Year Program Projects Delivered to Letting

Description: Measurement of the success in delivering projects that were, for example, displayed in the 5-Year Planning Program in 2014, and include a five-year projection for 2015-2019.

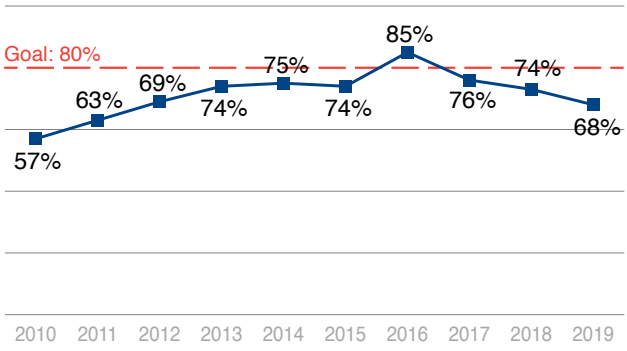
Purpose: This measurement monitors the delivery of projects to the public. In 2019, for example, we are assessing how many projects in the 5-Year Planning Program in 2014 were actually let between 2015 and 2019.

Goal: To deliver 80% of projects in the 5-Year Program on time.

Outcome: 68% of projects identified in the five-year schedule of highway projects in 2014 were delivered to letting by 2019, compared to 74% in 2018.

Program Period	5-Year Projects	Projects Delivered
2006-2010	347	197
2007-2011	342	215
2008-2012	319	221
2009-2013	270	200
2010-2014	376	283
2011-2015	428	316
2012-2016	410	349
2013-2017	395	300
2014-2018	428	318
2015-2019	450	307

Percent of Projects
Delivered in the 5-Year Program



FEATURED STRATEGY

Overcoming Uncertainties to Deliver for Nebraska Project Delivery in a Year of Extreme Challenges

Each year poses new challenges for transportation departments across the nation as they work to become more reliable for their industry partners, as well provide more certainty for the traveling public. While most challenges are easily identifiable, 2019 presented historic challenges, not only for Nebraska, but for most of the Midwest.

The bomb cyclone hit in early spring, just as NDOT began to prepare for the usual construction season. The tireless work NDOT teammates put into quickly repairing flooded roadways and structures was extraordinary. While work began in the field to restore mobility, staff within NDOT Central Headquarters were working through how to balance recovery while also evaluating how the flood would impact the 2020 construction program. Through balance and constant analysis, NDOT continues to work through the impacts of the flood, both construction-wise and fiscally

In 2016, the department began measuring its effectiveness in providing communities and stakeholders better planning reliability around the projects they can expect NDOT to undertake. Progress was steady in 2017 and 2018, however, with the challenges of 2019, including the closures of over a third of Nebraska's state highway system and $200 million in damages, a slight decline was to be expected. Despite the challenges of 2019, 78% of projects in the 1-Year Construction Program were delivered to letting on time, a significant accomplishment.

The scope of work between the planned program, coupled with recovery from the spring flooding was, at times, overwhelming. However, through dedicated collaboration within NDOT, as well as with local public agencies, consulting and contracting companies and federal regulatory agencies, the unachievable was realized.

While flood-related repairs consumed many resources, NDOT remained committed to the progress of ongoing projects such as the US-30 Rogers to North Bend project, already under construction when the flood occurred.

US-30 is key to statewide connectivity throughout Nebraska and part of the priority commercial system that carries higher traffic volumes, including commercial vehicles. The Rogers to North Bend project is the second of three recent projects that create a four-lane expressway corridor from Columbus to Fremont.

Despite historic flooding, and construction being hampered by the effects of area flood damage, both along the project route, and by damage to a bridge on N-15 south of Schuyler, and to US-30 west of Arlington, NDOT remained committed to moving forward with this vital project. Through the work of NDOT teammates and our partners, project completion was delayed less than nine months and is anticipated to be completed in summer of 2021.

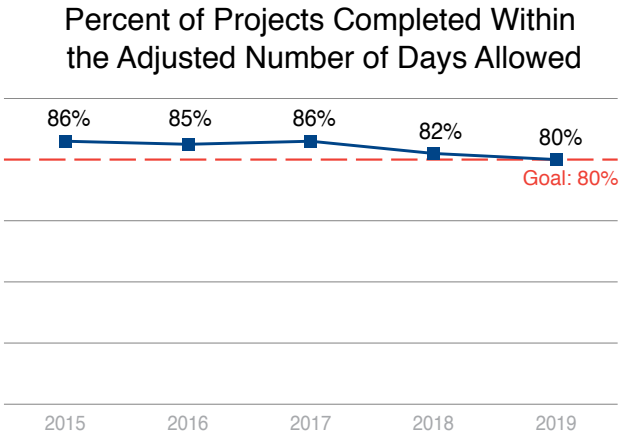
Construction Projects Completed Within the Adjusted Days Allowed

Description: Measurement of estimated time to complete a project.

Purpose: This is a measure of our ability to accurately estimate the amount of time necessary to complete a construction project (contract time allowance).

Goal: 80% of calendar year projects completed within the current contract time allowance.

Outcome: 80% of projects were completed within the number of days allowed in 2019, meeting the goal.



Number of Projects Completed	
Year	Projects
2015	220
2016	185
2017	151
2018	118
2019	120

FEATURED STRATEGY

US-34/75 Plattsmouth to Bellevue Freeway Completed

On July 30, 2019, the Nebraska Department of Transportation announced that, after nine years of continuous construction, the freeway on US-34/75 from Plattsmouth to Bellevue, along the state's eastern border, was substantially complete.

The construction of this highway segment began in 2011 and was completed in three separate projects with multiple phases. It consists of three new interchanges, new four-lane pavement, eight new bridges, and numerous county road and municipal street realignments and cost approximately $125.9 million.

The freeway now continues from Omaha through Bellevue to the north side of Plattsmouth and is the northern part of the Omaha to Nebraska City expressway system. The next expressway phase of construction, Murray to Plattsmouth, is funded and expected to begin in 2021. The final two projects – Nebraska City to Union and Union to Murray, are funded for design.

The Nebraska Expressway System was adopted into law in 1988 to finish a 600-mile network of four-lane highways to boost the economy, promote public safety and ease commutes between major cities. Additional funding was approved through the 2011 Build Nebraska Act (BNA) which reassigned, for 20 years, one-quarter cent of state general sales tax receipts to finance expansion and completion of the Expressway System and other highways. The 2016 Transportation Innovation Act established a transportation infrastructure bank funded from the state's rainy day fund and a portion of gas tax revenue, for a period of 20 years.

PROJECT DELIVERY HIGHLIGHT

Accelerating to Deliver:

An innovative approach to financing the Lincoln South Beltway

After decades of planning, construction on the Lincoln South Beltway, one of the largest capital improvement projects undertaken by NDOT in recent years, began in May 2020. It will cost over $350 million and will serve as the primary route between US Highway 77, west of Lincoln, and Nebraska Highway 2 east of Lincoln. The Lincoln South Beltway will improve safety and east-west connectivity for regional and interstate travel.

Typically, NDOT would undertake a project this large using multiple construction contracts as annual funding permitted, likely over a period of eight years, much too long if innovative funding approaches can be applied to accelerate completion. For the Lincoln South Beltway, the department will use an innovative approach, the issuance of Deferred Contract Payment Certificates (DCPC), to allow completion of the project in only three years.

As the contractor earns amounts for work completed, NDOT will issue the contractor Deferred Contract Payment Certificates, obligating the Department to pay for the completed work. NDOT will provide a maximum quarterly payment of up to $7.5 million or $30 million per year. The quarterly payments to the contractor will continue until payment of all obligations is complete. For each DCPC issued, the contractor will identify the financing partner to whom the DCPC amount has been assigned. Payment of the quarterly amounts is dependent upon the Nebraska Legislature appropriating the needed funds.

Deferred Contract Payment Certificates are not the only innovative funding approach being applied to this project. Two other statutes adopted in recent years are also providing funding for the project.

The Build Nebraska Act (BNA) and the Transportation Innovation Act (TIA) have been critical in expanding NDOT's ability to deliver important capital improvement projects on Nebraska's transportation system. Enacted in 2011, the BNA dedicates ¼ of one percent of general sales tax receipts for expansion of Nebraska's Expressway System and federally designated High Priority Corridors, and preservation of the existing transportation system. The Act dedicates 85% of the revenue generated to state projects and 15% to local roads and streets. Estimated total revenue for NDOT projects will be $1.2 billion before the Act sunsets in 2033.

The Transportation Innovation Act, adopted in 2016, created the Transportation Infrastructure Bank (TIB) that received a one-time transfer of $50 million from the state's Cash Reserve Fund. In addition, the TIB receives annual revenue from State fuel taxes, for which the rate increased from 7½ cents per gallon in 2015 to 9½ cents per gallon in 2019, in accordance with legislation adopted in 2015 (LB610). The fuel tax revenue will generate an estimated $400 million for infrastructure investment before the Act sunsets in 2033.

ASSET MANAGEMENT

Operate, Maintain, Upgrade and Expand Physical Assets Effectively Throughout Their Life Cycle

Performance measures have been developed to monitor the condition of Nebraska's roadways, bridges and fleet. Various strategies are used to meet goals and objectives to preserve, rehabilitate and replace major assets managed by the department.

Pavement Condition of Nebraska Highways

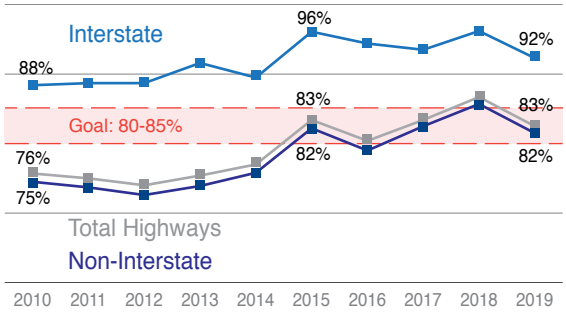
Description: Measurement of the pavement quality of the state highway surface.

Purpose: This is a measure of the pavement condition of the state's 10,000 miles of highways. Pavement condition ratings are based upon annual automated and visual inspections and are rated according to the Nebraska Serviceability Index (NSI). Highway pavement sections are rated on an NSI scale of 0-100 with any section rated 70 or above considered good. This information is used to help determine appropriate strategies for maintenance, rehabilitation, or reconstruction.

Goal: 80-85% of the highway system miles shall be rated at least good (NSI rating ≥70).

Outcome 83% of the highway system is rated at least good, exceeding the goal.

Percent of Miles at Least "Good" (NSI ≥ 70)



FEATURED STRATEGY

Maturity Method vs. Concrete Cylinders

The NDOT is now utilizing the maturity method in place of concrete cylinders on many projects to verify new concrete pavement has reached sufficient strength to allow construction to proceed. In the past, NDOT technicians would make two sets of cylinders for compressive testing. The cylinders would stay at the project site for two days and then be transported to the nearest NDOT Branch Lab. The Branch Lab would test the first set of cylinders at three days and if they did not meet the minimum 3000 psi requirement, the second set would be tested at four days. Once the concrete reached the minimum 3000 psi requirement, the contractor was allowed to put equipment on the newly paved concrete.

The maturity method is a technique for predicting concrete strength based on the temperature history of the concrete as it matures. As cement hydrates, the temperature and strength of the concrete increases. By correlating rising temperature with 10 cylinder strengths at the beginning of the project, maturity graphs are developed that can be used for the remainder of the project in place of additional cylinder fabrication and testing. Utilizing the maturity method reduces the number of cylinders required on a large project from 12 every day to 10 the first day and 10 at a later date for maturity graph verification. This method significantly reduces the time and effort involved with making cylinders, transporting them, and testing them. It produces faster results which leads to more efficient paving.

Smoother Roads

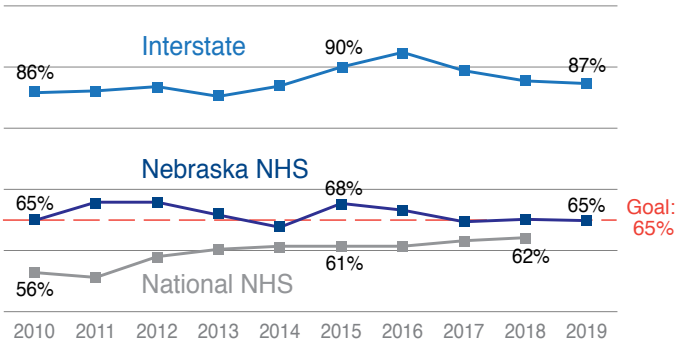
Description: Measurement of the smoothness of the roads on the National Highway System (NHS). The NHS is a subset of the highway system and includes roads that are important to the nation's economy, defense and mobility. The National Highway System is comprised of 3,655 miles of state highways and local roads.

Purpose: One measure of the smoothness of roads is the International Roughness Index (IRI). This index measures pavement roughness in terms of the number of inches per mile. The lower the IRI number, the better the ride. A smoother roadway is safer and more satisfying to the users of our highway system.

Goal: 65% of all miles on the National Highway System shall be maintained at an acceptable ride quality of "good" (IRI ratings < 95 in/mi). National data is not available for 2019.

Outcome: 65% of Nebraska's National Highway System miles had an IRI rating of good, meeting the goal.

Percent of "Smooth" Miles on the NHS (IRI < 95)



FEATURED STRATEGY

Replacement of Nuclear Density Gauge with Light Weight Deflectometer

The assurance of properly placed earthwork materials is essential to ensuring NDOT roadways perform as designed. In the past, NDOT used nuclear gauges with a radioactive source to measure in-place density and moisture characteristics of roadway embankment and subgrade materials as part of its quality assurance procedures. Although the nuclear gauge is a standard test method that is used widely across the nation, there are strict licensing and regulatory requirements for operation of the gauge. In addition to the annual licensing fees ($18,000/year), monitoring programs ($8,500/year), and training requirements, the gauges also required dedicated storage facilities with appropriate shielding to prevent radiation exposure and carried stringent requirements for transportation to the project site. Each year the 87 gauges had to be calibrated, taking approximately 700 hours, not including travel time to pick up and return them from various locations across the state.

In 2012, NDOT began evaluating the use of non-nuclear devices and fully implemented the use of the Light Weight Deflectometer (LWD) on all projects and became "non-nuclear" in 2016. LWD results have proven to be more reliable and indicative of the actual strength and stiffness of compacted soil materials and help ensure a more uniform product with the desired material strengths needed for the placement of the roadway pavement. In addition, there are no regulatory, storage or transportation requirements to operate the LWD and training can be provided by NDOT staff. From the start of implementation, NDOT has collected LWD test results from the field and comparisons have been made for each individual Nebraska Group Index (NGI) soil found in the state. As the database is built up over time, less and less field testing will be required and more lab correlations can be used to quickly determine compaction requirements leading to more efficient reporting and construction.

Nebraska Bridges in a State of Good Repair

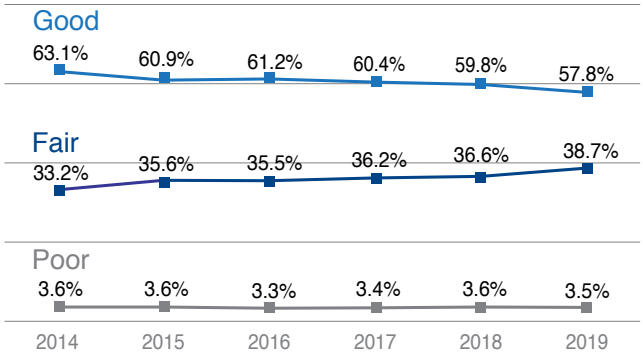
Description: Measurement of the progress towards keeping state-owned bridges in a condition of good repair.

Purpose: All bridges in Nebraska are safety inspected every two years and the condition information is stored in the Nebraska Bridge Inventory. This condition information is used by the Bridge Management Section to determine cost-effective strategies to keep the bridges in good repair. The necessary work may include preservation, repair, maintenance, re-decking, rehabilitation or replacement.

Goal: To have 95% of Nebraska state-owned bridges in good or fair condition.

Outcome: 96.5% of Nebraska's state-owned bridges are in good or fair condition.

Percent of State-Owned Bridges in Good, Fair or Poor Condition



Major Bridge Components *- bridge deck, superstructure, substructure*
Good *- major bridge components are all in good condition or better*
Poor *- one or more major bridge components are in poor condition or worse*
Fair *- all other bridges*

Year	Nebraska Bridges
2010	3,517
2011	3,516
2012	3,514
2013	3,520
2014	3,519
2015	3,517
2016	3,524
2017	3,525
2018	3,523
2019	3,524

FEATURED STRATEGY

Proposed Changes to the National Bridge Inspection Standards

A proposed update to the National Bridge Inspection Standards (NBIS) was published by the Federal Highway Administration in November 2019. The proposed changes include new requirements for how bridges are inspected, the intervals at which bridges are inspected, the qualification requirements for bridge inspectors, and the procedures for reporting and monitoring bridges. A more flexible proposed inspection interval would make it easier for Nebraska to ensure inspections are completed in a timely manner.

The NDOT Bridge Division, in coordination with other state DOTs, reviewed and provided comments on the proposed changes. The final rules are expected at the end of 2020 or early in 2021.

Once the new standards are approved and finalized, there will be an interval to prepare for implementation of the new inspection protocols. This will involve development of new software that is used in inspection data collection and reporting, updating the Nebraska Bridge Inspection Manual, inspector training, and historical inspection data conversion.

These changes will provide an opportunity to enhance the quality of bridge inspection data. Some ambiguous language from previous versions has been clarified and guidance has been incorporated for new inspection methods such as unmanned aerial systems (drones), that can make inspections safer to perform and more relevant to the decision making needs of bridge asset managers.

In Nebraska, about 200 certified bridge inspectors inspect approximately 15,500 bridges every two years. The inspection information they report is used by state and local agencies to inform investment decisions about how to keep bridges safe, serviceable and in the best possible condition at the lowest practicable cost. For inspection procedure guidance, Nebraska inspectors refer to the Nebraska Bridge Inspection Program Manual, which is based on the National specifications, but has some additions to support Nebraska agencies.

The main purpose of the NBIS is to ensure the safety of the traveling public on highway bridges by supporting uniformity of bridge inspection procedures. The most recent changes to the NBIS were minor updates in 2009, when a revised manual for bridge inspection was published and a more significant update that introduced a more detailed inspection method (element inspections) in 2013.

Deck Area of Structurally Deficient Bridges on the National Highway System

Description: To detail the condition of Nebraska bridges on the National Highway System (NHS), both at the state and local levels. It is important that the bridges in Nebraska are safe and able to carry the loads necessary to keep our economy moving forward. Because funding is not always available to maintain these structures in excellent condition, we must determine the deficiencies to measure our progress.

Purpose: To report on the overall condition of our bridges and compare that condition to the goals we have set.

Goal: Less than 10% of the total deck area of bridges on the NHS classified as structurally deficient.

Outcome: Nebraska has met the goal.

This measure reveals that 98.1% of the deck area of Nebraska's bridges on the NHS is classified as structurally sound, leaving only 1.8% of the deck area classified as structurally deficient.

FEATURED STRATEGY

Temporary Bridges – "Bridge in a Box"

The flooding began in north central Nebraska on Wednesday, March 13. The US-281 bridge over the Niobrara River near Spencer was damaged and a large portion of its southern approach on U.S. Highway 281 was washed away when the Spencer Dam upstream was destroyed by huge chunks of ice and rushing water. Later that day, as floodwaters moved further east, they seriously damaged a bridge on Highway N-12 and completely washed away another bridge near the town of Niobrara.

On Saturday, March 16, Senior Bridge Engineer Mark Traynowicz was on the phone, contacting the Acrow Corporation of America in Parsippany, New Jersey, and leaving a message to let them know that, "We've got big problems here and will probably need your help."

Acrow specializes in providing emergency bridging solutions for restoring transportation lifelines under extreme circumstances. Their bridges are able to meet emergency infrastructure needs and are deliverable under harsh conditions. Acrow has replaced bridges lost to natural catastrophes throughout the world.

Within an hour of his call, a representative from Acrow called back. Traynowicz told the Acrow representative that Nebraska would probably need two bridges, but was not sure of the length. While he didn't offer them a contract at that time, Acrow began assembling the components of potential bridges for Nebraska, so they could be delivered as quickly as possible when a contract was put out for bids.

The bridges made available to Nebraska are military-style bridges, called "Bailey Bridges." First built by the British during World War II, they can be assembled quickly and carry extra heavy loads. "They show up in crates – like an Erector Set," said Traynowicz.

The temporary bridges, rented from Acrow, were opened to traffic at the location near Spencer on July 26 and at the Niobrara location on August 13 (see cover photo). Contractors building the permanent replacement bridges are responsible for installing and maintaining the temporary bridges and will be responsible for removing them once the permanent bridges are complete and in service. The permanent bridges near Niobrara and Spencer are expected to be finished in the fall of 2020.

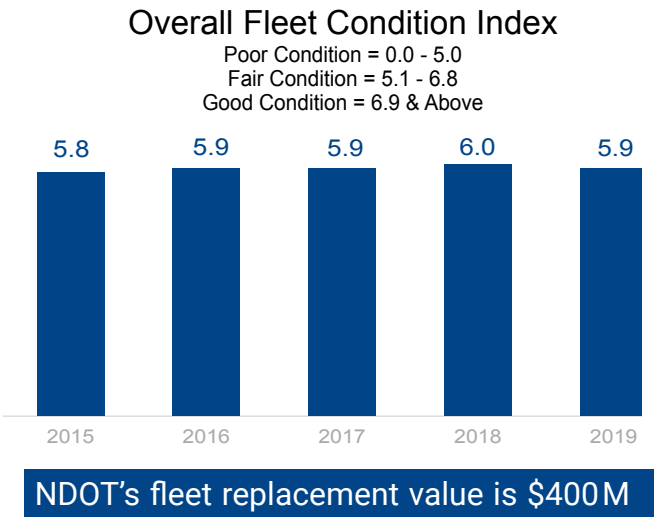
Fleet Condition Index

Description: Measurement of the current condition of the department's fleet.

Purpose: This measure is used to determine appropriate strategies for proper maintenance, repair and replacement of fleet equipment.

Goal: Achieve and maintain an overall fleet condition index of good.

Outcome: The overall Fleet Condition Index for 2019 is 5.9. The rating shows that our Fleet remains rated in "Fair Condition." Fleet data also shows us that over 55% of our core fleet is at or beyond its expected life-cycle age and unplanned repair costs continue to rise.



NDOT's fleet replacement value is $400 M

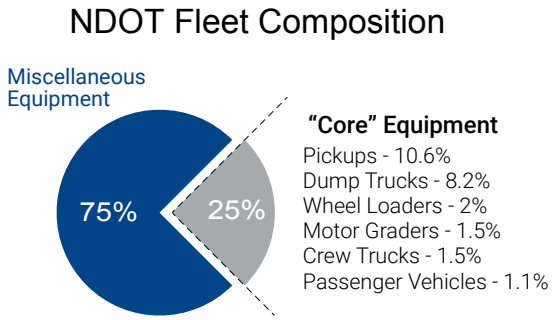
FEATURED STRATEGY

Fleet Management Program

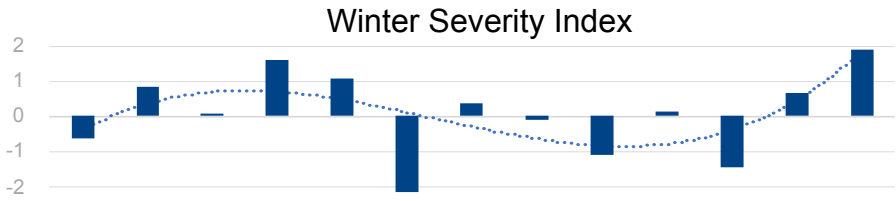
NDOT conducts fleet studies to help inform and guide decision-making related to the management and maintenance of the department's 8,700 plus pieces of equipment. Internal fleet studies were conducted in 1997, 2008 and 2018.

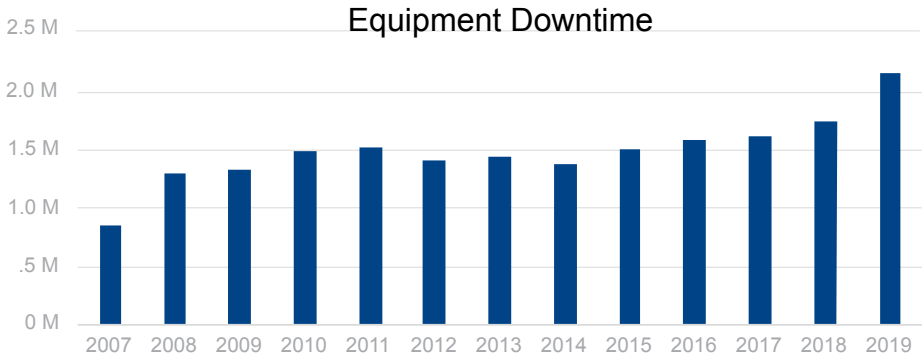
In 2008, NDOT revised and extended life cycle guidelines for multiple classes of equipment, altering the percentages and designations of funding to direct 70% to six "core" equipment categories.

In 2019, NDOT hired a professional fleet consulting firm to provide recommendations on equipment life cycles, and estimated impacts of various funding levels on NDOT's fleet replacement program. Results of this consulting project will help to inform budget preparations for the 2022-2023 biennium.



The harder we work our equipment, the greater the potential for equipment downtime.





ASSET MANAGEMENT HIGHLIGHT

More Durable Bridges Using Ultra-High Performance Concrete (UHPC)

Building bridges expected to last much longer than current structures; building them in a manner that is safer for bridge contractors, and building them more quickly—developments all nearing accomplishment through research that includes the work of two outstanding University of Nebraska researchers in partnership with Nebraska Department of Transportation engineers. These are successes made possible by the development of Ultra-High Performance Concrete, using Nebraska aggregates, in the production of "decked NU bridge systems."

Ultra-high performance concrete has been around for nearly two decades. Since the early 1990s, the French Lafarge Cement Company has marketed a UHPC product called Ductal, based on a product developed by employees of the French contractor Bougues. Its high cost, however, has discouraged widespread use of this outstanding material.

In 2009, Maher K. Tadros, PhD, PE (Emeritus) and George Marcous, PhD, PE, both members of the UNL College of Engineering faculty, published the results of research sponsored by the Nebraska Department of Transportation and the University of Nebraska-Lincoln. The general objective of the research was to "promote the use of UHPC in the construction of precast prestressed bridge girders in Nebraska." The specific objectives were to: (1) develop an economical and practical UHPC mix or mixes with a target compressive strength of 18 ksi and performance characteristics superior to those of the mixes currently used in Nebraska; and (2) to investigate the use of the developed UHPC mixes in developing an optimized section for prestressed bridge girders using the forms that are readily available to precast producers in Nebraska.

In developing various trial mixes as part of this research, Tadros and Marcous used locally available materials, that is, those found in Nebraska, "such as fine sand, limestone, and Class C fly ash," to minimize material cost.

Since the 2009 research was published, work has continued by Tadros and Marcous, among others, to bring UHPC into broader application and usage.

A recent article, published in "Structure Magazine" in April 2019, compares a conventional structure to one using UHPC: "a conventional bridge system, using eight-foot-deep beams spaced nine feet apart with a composite cast-in-place deck can span up to 180 feet. A UHPC-decked I-beam system [precast concrete girders and deck systems in one piece] with the same total superstructure depth and spacing would have a maximum possible span of 265 feet while using a fraction of the total concrete volume. Also, it may be possible to eliminate all shear reinforcement, thus greatly simplifying production."

Work is continuing to bring the decked I-beam system to production and widespread use. When the ability to produce this product on a large scale has been realized, then, according to NDOT Senior Bridge Engineer Mark Traynowicz, "we will have two companies in Nebraska capable of building this system—Concrete Industries in Lincoln and Coreslab Structures in LaPlatte." According to Traynowicz, "they have made NDOT's girders for years—this will be another product they can produce. Most bridge contractors in the state will be able to assemble these bridge systems. Construction of bridges using these girders will be safer and faster for the contractor and the traveling public. The ultra-high performance concrete is so durable, it will last much longer than traditional concrete and traditional bridges."

Perhaps surprisingly, Tadros and Marcous do not plan to patent this product or the method used to produce it. Instead, they are sharing their developments with all who want to use them to build and install safer, more durable bridges across the country and throughout the world.

MOBILITY

Improve Mobility on Nebraska's Transportation System Through Increased Reliability, Capacity and Efficiency

The purpose of the goal is to improve mobility on Nebraska's transportation system through increased reliability, capacity and efficiency. Goal objectives include reducing the duration of incident response and clearance times as well as improving the system's operating efficiency. Responding to and clearing an incident on the roadway as quickly as possible will allow traffic to return to normal conditions, thereby improving the system mobility.

Omaha Urban Freeway System	
Hwy.	**Ref. Post**
US-6	356 - 365
US-75	76 - 93
I-80	439 - 455
I-480	0 - 4
I-680	0 - 13

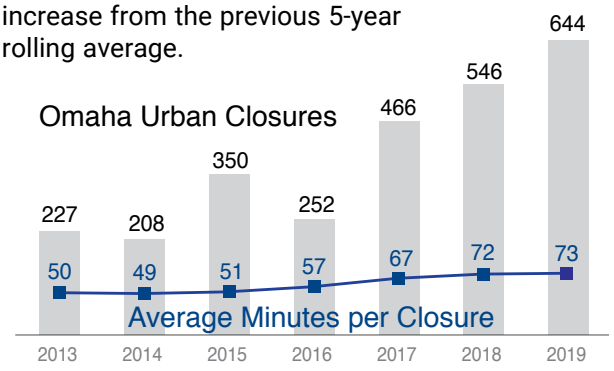
Omaha Urban Freeway Incident Clearance Time

Description: Measurement of and average response time for unplanned incidents that require the temporary closure of one or more travel lanes of the Omaha freeway system (i.e., debris on the roadway, vehicle fire on the shoulder, crashes, etc.).

Purpose: To increase awareness of the length of incident clearance times in the responder community. Through awareness and incident response traffic control training, responders can shorten certain incident response activities such as towing, quick clearance and moving accidents to the shoulder. Quick response time can help to avoid secondary incidents and return traffic to free-flow speed as soon as possible.

Goal: A 5% reduction in the 5-year rolling average of the number of minutes clearance time per incident per year.

Outcome: The 5-year rolling average of minutes per closure for 2015 to 2019 is 64.0, an 8% increase from the previous 5-year rolling average.



FEATURED STRATEGY

TIM Effectiveness

For professionals who respond to highway incidents, the risk of injury or death is constant. According to the National Traffic Incident Management Coalition (NTIMC), traffic crashes and "struck-by" incidents are a leading cause of on-duty injuries and deaths for law enforcement officers and other emergency professionals. Emergency professionals includes 911 dispatchers, firefighters, law enforcement, traffic management center staff, towing and recovery professionals, and maintenance crews. Safe and quick clearance of highway incidents reduces the exposure to harm and increases safety for all. Effective TIM keeps traffic moving and improves the safety of motorists, crash victims, and emergency responders involved with or passing by the incident.

National Traffic Incident Management (TIM) Responder Training provides first responders a shared understanding of the requirements for safe, quick clearance of traffic incident scenes; prompt, reliable and open communication, and motorist and responder safeguards.

Nebraska is a national leader in TIM training, having exceeded the FHWA's goal of 45% of respondents trained with 54% of responders trained, ranking Nebraska 11th in the United States.

In July 2019, the department presented statewide TIM training through an interactive seminar. Public agencies that had at least 60% of their members attend the TIM training received $700 worth of traffic safety devices. Eligible agencies included paid or volunteer fire departments, EMS departments, community emergency response teams, law enforcement agencies and public works departments.

Rural Interstate 80 Reliability

Description: Measurement of the number of complete closures[1] and the average minutes per closure on Interstate 80.

1 Closures are defined as complete closure of all lanes eastbound or all lanes westbound, closures due to construction (planned closures) are not included. The average number of minutes per closure is measured from the time the department is aware of the closure to the time the Interstate is open to traffic.

Purpose: To track the incident response and mitigation of one of Nebraska's main arteries in an effort to improve and enhance the reliability of the highway system. This purpose helps achieve the department's long-range transportation plan objective to improve and expand the transportation system to increase capacity and reliability and enhance operations.

Goal: A 5% reduction in the 5-year rolling average of the number of minutes per closure per year.

Outcome: From 2015 through 2019, the 5-year rolling average of minutes per closure due to incidents was 143.6 minutes, a less than 1% increase from the previous 5-year rolling average.

From 2015 through 2019, the 5-year rolling average of minutes per closure due to weather was 394.2 minutes, a 0.9% decrease from the previous 5-year rolling average.

I-80 Complete Closures

Year	Incidents	Avg. Minutes Per Closure
Due to Incidents		
2013	9	227
2014	29	147
2015	28	124
2016	63	129
2017	39	138
2018	33	179
2019	55	148
Due to Weather		
2013	6	702
2014	2	599
2015	1	192
2016	10*	443
2017	1	108
2018	3	832
2019	8	396

** Four of weather closures were due to Wyoming closing.*

FEATURED STRATEGY

Moving Wind Towers Across Nebraska

Massive components comprising the increasing number of wind towers in wind farms, throughout Nebraska and across the nation, must be transported from factories to final destinations, on Nebraska's highways, including Interstate 80 and others. Sometimes, when components enter the state, they are going directly to their final destination. Other times, they go to a staging area to be stored before being moved to their final destination. And sometimes, they are just passing through Nebraska to another state.

For each wind tower built, there are at least eight components: three tower pieces; three wind blades, one hub, and one nacelle that houses electrical equipment. Each of these components is transported on a separate truck. During January through April 2020, an average of 590 trucks per month, each carrying one piece of a wind tower, passed through Nebraska.

Transporting these components requires submission of a route survey to the NDOT Motor Carrier Permits office and approval of that plan by NDOT. Every route survey must show the functionality of the intended route: (1) the truck will remain on the paved surface of each road and intersection on the route through Nebraska to its destination; (2) the truck will not drive over a median; and (3) the truck will never head into oncoming traffic. Whether on I-80 or other state highways, the route survey is sent by the Motor Carrier Permits Office to the NDOT District Engineer in charge of the roads over which the truck will travel. The District Engineer reviews the route plan to assure that it is feasible for a truck carrying wind turbine components to complete the route outlined in the route plan without violating the three requirements.

An approved route survey is good for 30 days and can be used as many times as the carrier chooses within that timeframe. NDOT tries to be as accommodating as possible, but carriers must be diligent in complying with the terms of the approved plan. This includes being careful not to damage roads, shoulders and medians and properly replacing signs that are removed to accommodate passage.

MOBILITY HIGHLIGHT

Lane Closure Performance Measure

On many of NDOT's construction projects, work zones are set up for the purpose of warning drivers and protecting workers. In many cases, travel lanes are closed to provide the contractor with greater freedom of movement to perform the necessary work. In addition, contractors are given the flexibility to set up and maintain work zones to suit their operational preferences. The contractor community has informed the NDOT that this flexibility is something contractors rely on to keep their bid prices low.

The traveling public, however, often views lane closures as a hindrance to their trip, especially when the driver sees little to no work being performed in the work zone. As such, the NDOT is faced with the competing interests of work zone flexibility for contractors and maximizing the free flow movement of travelers.

To understand this relationship better, the NDOT Construction Division set out to study whether various specifications in the contract, such as lane rental, would reduce the expected duration of lane closures during construction projects. Lane rental means that a contractor must rent a lane in order to close it. This creates an incentive for the contractor to be innovative and minimize the duration of lane closures.

In 2019, the Construction Division, in partnership with the Districts, added lane rental specifications to five projects. Subsequent data collection and estimating methods were developed to compare lane closure duration for these projects and for a few other projects without lane rental specifications.

The results of this study found that projects with a lane rental specification resulted in fewer lane-miles of closure when compared with similar projects without the specification. The study results seem to indicate that lane closure specifications may be effective in reducing lane closures experienced by the driver during construction projects.

But what about the project awards? Contractors have historically told the NDOT that greater flexibility related to lane closures allows them to give better bid prices on projects. In the case of these five projects, however, data analysis determined that the five project awards were not significantly higher than similar projects that did not have lane closure specifications.

Overall, the study found that lane rental specifications may be effective in reducing the duration of lane closures on certain construction projects without significantly increasing the award price. It should be noted that the sample set for this study was small and lane rental specifications can only be used in certain situations. For this reason, the study should not be considered conclusive. NDOT will continue to study the effectiveness of various contracting specifications related to lane closures.

COMMUNICATION, COORDINATION, COLLABORATION & COOPERATION (4Cs)

Collaborate with Stakeholders to Maximize the Value of Nebraska's Transportation Investments

FEATURED STRATEGY

New Roadside Memorial Policy

To balance safety considerations and sensitivity to families wishing to memorialize their loved ones, the Nebraska Department of Transportation issued a new policy in 2019 governing the placement of roadside memorials.

Before the new policy was implemented, it was common for family or friends of a person killed in a crash on a Nebraska state highway, to build a memorial of flowers, signs, and sometimes other items, on the roadside, at the location where the crash occurred. Until now, there has been no official policy regarding these memorials, which are, technically, illegal.

The absence of a formal policy related to roadside memorials sometimes resulted in memorials that could be distracting to drivers, obstruct visibility, create a hazard for a vehicle that left the roadway, or become unsightly if left untended.

The new policy, adopted in November 2019, allows for a meaningful memorial, but establishes limits on its structure and appearance, and limits the time the memorial can be in place.

Under the Roadside Memorial Policy, a member of the deceased's immediate family can apply for a Memorial Sign within ten years following the date of the crash in which the victim was killed. Any person killed as the result of a motor vehicle crash on the State Highway System is eligible to have a sign erected unless the person was a driver involved in the crash who had a blood alcohol content equal to or above the legal limit or who was impaired by an illegal substance.

The permitted memorial, designed by NDOT, is a sign with a blue background and white letters. It includes a safety message and the recipient's name. Each Safety Message sign, 24 inches square, features one of a choice of five safety messages, including:

- Please Drive Safely
- Seat Belts Save Lives
- Don't Drink and Drive
- Don't Text and Drive
- Don't Drive Impaired

The names of either one or two persons who perished may be placed beneath the safety message on a sign that reads "In Memory of" and the name or names.

The memorial sign is placed, by the Department of Transportation, near the highway, as close as possible to the requested location. The signs will not be placed on Interstate highways or within municipalities. When a memorial sign is placed, it will stay in place for two years, then be removed by NDOT. Once the sign is removed, the family will be notified and the memorial plaque will be made available to them.

WORKFORCE DEVELOPMENT

Support and Facilitate the Development of a Skilled Workforce that Enhances Workplace Productivity and Increases Opportunities for Employees to Learn New Skills

FEATURED STRATEGY

Training Gets Strategic

In 2019, each NDOT division head and district engineer was asked to develop training plans that included training necessary to be completed for each job in their district or division. These plans were used in developing the NDOT Strategic Training Plan.

The purpose of the NDOT Strategic Training Plan is to strategically identify and budget for training needed by staff over the course of the next year. Some divisions and districts were very ambitious in their lists of training and the Human Resources Division is doing its best to accommodate those requests.

Currently, HR Workforce Development's Training Coordinator, is busy working with the divisions and districts to identify the top three training priorities and ensure that the training is made available to staff, either as online or classroom offerings. By coordinating this effort, the number of times a course is offered can be reduced, reducing costs and ensuring the classroom is filled as close to capacity as possible.

NDOT employees are encouraged to work with their supervisors to participate in available training that is valuable or critical for performing their jobs.

A list has been compiled of over 200 courses needed by NDOT staff. These courses may be available online, in the classroom, or as hands-on learning such as equipment training.

FEATURED STRATEGY

NDOT's First Boot Camp – For Supervisors

Fundamentals of Supervision is a new 2½-day course dedicated to the induction of new supervisors into the role of supervision. This course, fondly referred to as "Supervisor Boot Camp," includes three parts:

Part 1 consists of a series of online courses relating to the changing role of a teammate as he/she takes on the additional role of supervisor.

Part 2 is a jam-packed 2½ days of classroom training dedicated to understanding how the role of supervisor differs from that of an individual contributor, as well as critical insight into setting expectations, monitoring progress, giving feedback, and completing performance evaluations accurately. Additional topics include Workplace Motivation, Workplace Harassment and Situational Leadership. Participants spend quite a bit of time talking about equal and fair supervision techniques and consistent policy enforcement.

Part 3 consists of a final series of online courses including Effective Coaching, Building Accountability and Setting Goals for Teammates.

The benefit of having a blended learning approach with both online and classroom training allows for less time in the classroom, and the flexibility for participants to complete portions of the training as they have time, rather than being limited to when the training may be scheduled.

The original intention was to have the target audience consist of new supervisors within their first year of supervision. Ideally, they would be within their first few months for the greatest impact. The unexpected response was the overwhelming support received from more experienced supervisors who wanted to attend themselves. For this reason, any supervisor is being welcomed who wishes to expand their knowledge and experience as a supervisor.

A future development may include a course specifically geared toward the experienced supervisor for further advancement of skills.

Feedback on the Supervisor Boot Camp has been very positive.

- *"Great Class"*
- *"The team was on point with information and bouncing ideas and responses off of each other to help the learning process ... A+"*
- *"I am thankful NDOT has classes like this to assist supervisors into their roles."*
- *"The most useful was seeing how the progression of workers move as they become more familiar with the job—how to help keep people motivated and trusting in you."*
- *"The information and experiences that were included in this class will help considerably in this journey."*
- *"The four points I took away from the class were to be decisive, set expectations, train employees according to their needs, and reinforce expectations equally."*

WORKFORCE DEVELOPMENT HIGHLIGHT

ALL ONBOARD!!

NDOT's Human Resource Division has developed and rolled out a new Teammate Onboarding Program designed to provide an organized, professional plan to welcome new teammates to the agency.

Statistics show that more than half of employees who leave their job, do so within the first year of employment because of a lack of training, engagement or introduction to the position/organization. An effective onboarding program is essential in reducing this initial turnover as well as in keeping teammates engaged as they move forward.

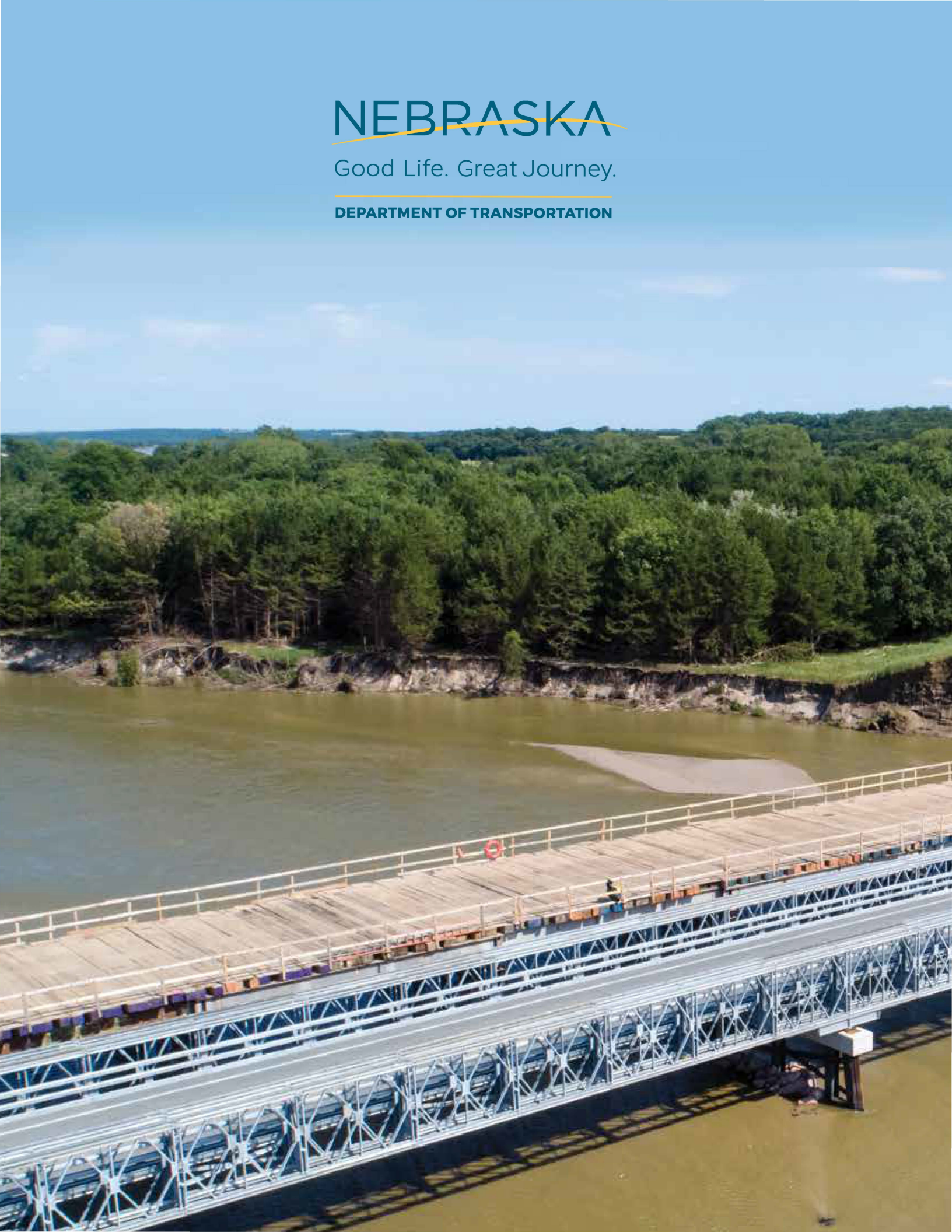
The NDOT onboarding program is not intended to require additional work for hiring supervisors. Instead, it provides an organized approach to tasks supervisors are already responsible for, welcoming new teammates and bringing them into the NDOT fold.

Two guides are available to assist in onboarding: a "New Teammate Welcome Packet" and a "Supervisor's Guide." Each guide is full of helpful checklists and guidance on important topics a new teammate will want to know, including training, introduction to the team, and supervisor expectations. The guides provide for general training needs, as well as opportunities for the supervisor to discuss specific training needs of the position.

It is important to welcome new teammates in the right manner. For this reason, NDOT's Human Resources staff is asking supervisors to always utilize this process – to print the guides and use them to guide their process of bringing a new individual into their existing team.

- Builds NDOT's reputation for being a great employer to work for, with great training, clear leadership and a strong organization.
- Helps retain staff members and reduces high turnover costs.
- Increases staff engagement and productivity.
- Builds a cohesive team and fosters collaboration.

NEBRASKA

Good Life. Great Journey.

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