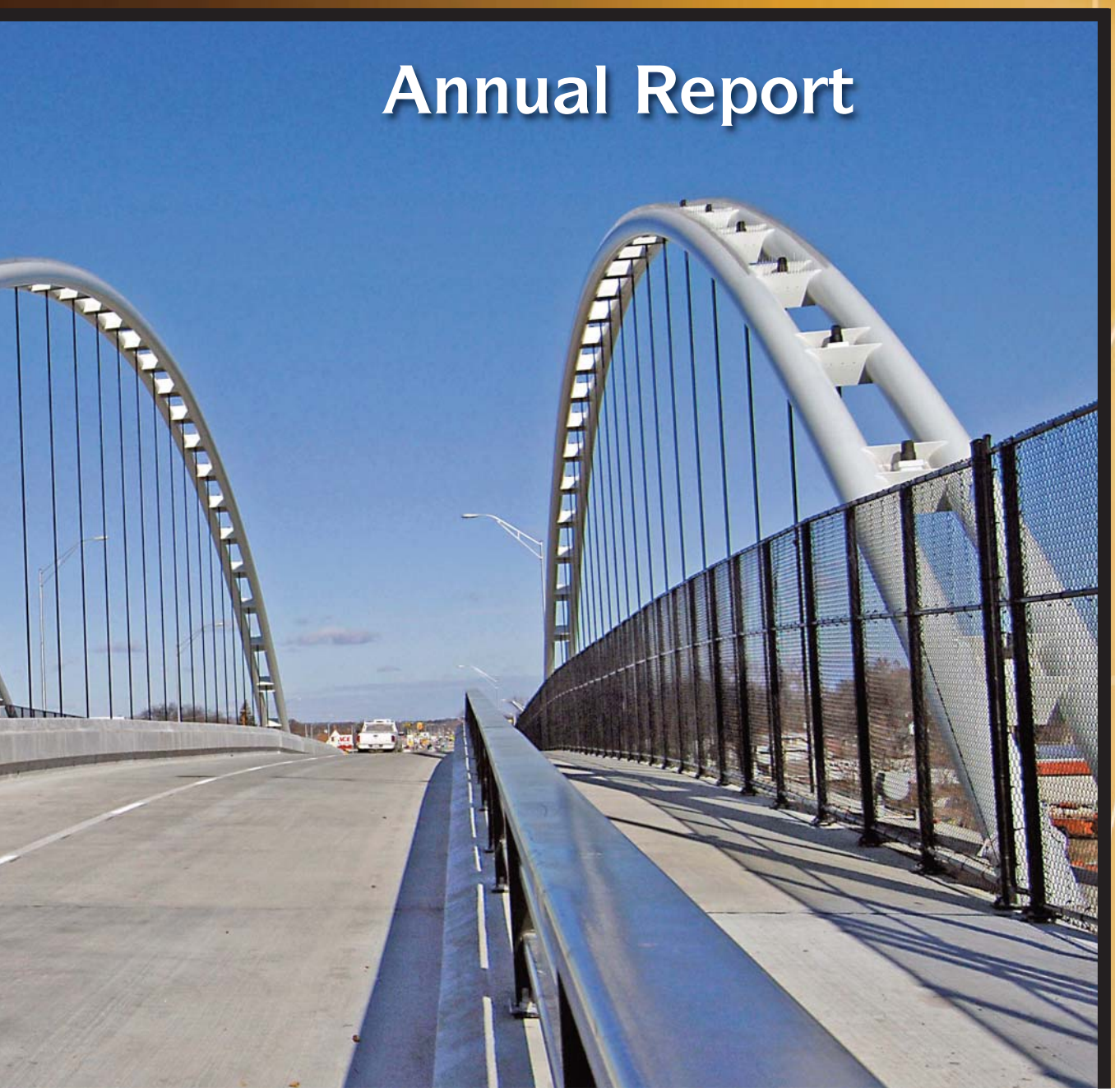
Partners in Transportation

Nebraska Department of Roads

Annual Report



2009

Our Mission

We provide and maintain, in cooperation with public and private organizations, a safe, reliable, affordable, environmentally compatible and coordinated statewide transportation system for the movement of people and goods.

Our Values

Safety

Public safety and service.
Employee safety.

Integrity

Trust of employees, industry partners, public, and elected officials.

Quality

Build quality products.
Provide quality service.
Hire quality people.

A scenic view traveling west on Highway 92 near the intersection with Highway 79 in Saunders County.

We Work to Provide

By Monty W. Fredrickson, P.E.
Director – State Engineer

Monty Fredrickson

Throughout 2009, the Nebraska Department of Roads worked diligently to put all Federal stimulus funds to work improving roads and creating jobs. We worked to ensure safer roads, monitor traffic, weather, and pavement conditions, and provide travel information to state highway motorists.

Facing uncertainties in transportation funding and challenges around every corner, we continue to study, revaluate, plan with options, and revisit our priorities. The Nebraska Department of Roads works to provide the best value for the dollars we invest to provide a safe, reliable transportation system. This we do in cooperation with our public and private partners. Using Global Positioning Systems (GPS), Information Technology Services (ITS), Environmental Management Systems (EMS), steel, asphalt or concrete, we work together to get a multi-purposed motoring public on their way to another day.

Our programming priorities reflect the needs of the highway system and its users. We must protect the state's investment. System preservation, high priority bridges and finishing the six-lane Interstate system between Lincoln and Omaha are the primary objectives. We continue to plan for capital improvement projects in our future.

Although the challenges seem many and grew during 2009, including the severe snow storms in December, this agency pledges its continued efforts to deliver a safe and reliable statewide transportation system for a diversity of residents, businesses and highway users.

Highlights

Nebraska Office of Highway Safety Moves to Roads Department

The Nebraska Office of Highway Safety made a mid-year move to the Nebraska Department of Roads. The office became a part of the Traffic Engineering Division, which currently includes an accident records and highway safety section along with its engineering, traffic control and analysis duties.

The primarily federally funded Nebraska Office of Highway Safety had been a division within the Department of Motor Vehicles (DMV). The 2009 Nebraska State Legislature passed LB 219 which transferred the responsibility of the highway safety program to the Department of Roads. Certain program responsibilities, including the child passenger restraint and occupation protection systems information and education, will be continued by the Nebraska Office of Highway Safety.

Memorial Display Honors NDOR Highway Workers

In May, a memorial honoring NDOR employees who died while working on road projects was displayed in Lincoln at the AAA Nebraska office. Fifty-five construction cones, each featuring the name and date of the death of the Roads Department employee and bearing a United States flag, lined the AAA grounds adjacent to "O" Street.

Photo courtesy of AAA Nebraska

Fifty-five construction cones were on display May 13-14 at the AAA Nebraska office in Lincoln, honoring the NDOR employees who died while working on road projects.

The cones had been on display at NDOR's central headquarters during National Work Zone Awareness Week in April and were also a part of the Governor's "Memorial Day Holiday Safe Travel" news conference.

The cones featured a name for every individual who, since 1943, lost their life while working on the highways for the Nebraska Department of Roads. No NDOR employee has been killed while working in a highway improvement work zone since 1999.

The year of death is included on the sleeves that slip over the top of each cone. The cones traveled to each highway district for their Recognition and Safety Stand Down Day events.

Tribal Relationships Update

The Nebraska Department of Roads participated in the Annual Tribal Transportation Conference hosted by the Bureau of Indian Affairs (BIA). Other participants included representatives from the Omaha, Winnebago and Santee Sioux Tribes, Knox County, the Federal Highway Administration, the Nebraska Local Technical Assistance Program (LTAP), the Northern Plains Tribal Technical Assistance Program (TTAP), and the Nebraska Congressional Delegation. The event took place October 22, 2009 in South Sioux City.

The NDOR portion of the agenda covered the District 3 Annual and Five-Year Program and the State Transportation Improvement Program (STIP), state and federal funding constraints, Local Public Agency procedures, and the impact of Nebraska's Preference Prohibition Constitutional Amendment on tribal preference programs administered by the Department. Other presentations addressed the BIA-administered Transportation Program in Nebraska, including each Tribe's Transportation Improvement Program (TIP), and highlights of the Nebraska LTAP's and the Northern Plains TTAP's activities.

The exchange of information, ideas and concerns proved valuable, as did the opportunity to extend contacts and to build relationships and trust. The Department's delegation included representation from District 3, Local Projects Division, Planning & Project Development Division, Right-of-Way Division, Roadway Design Division, Legal Division (Attorney General's Office–Roads Section) and Government Affairs Office.

Yankton Bridge spans the Missouri River between Nebraska and South Dakota.

Yankton Bridge Receives National Recognition

The new U.S. 81 Yankton Bridge, spanning the Missouri River between Nebraska and South Dakota, received two national awards in 2009.

In July, the new bridge received an "America's Transportation Award" and was later named to ***America's Transportation Award-Top 10***. Competition recognized outstanding transportation projects in categories including: "On Time," "On Budget," and "Innovative Management." NDOR's project was on time and on budget.

The $24 million, four-lane, steel girder bridge crosses the Missouri River over five piers and has 14 decorative 50-foot-tall spires that are wired for lighting. It is the first time the tower design has been used on a bridge.

The Yankton Bridge replaced the old Meridian Bridge, which was built in 1924 and served as a link between Nebraska and South Dakota for 84 years. The old bridge will be converted by the community of Yankton into a pedestrian and bicycling path.

Completion of the Yankton Bridge is the culmination of nearly 20 years of efforts by community members from both states. Noted accomplishments are: four lanes of traffic on a newly aligned roadway that provides more efficient, reliable traffic movement; enhanced environmental habitat and improved water conservation measures; a renewed pride by the area citizens in their safer, visually impressive and sleek new structure with its accommodating route.

The competition for the award recognized the nation's outstanding transportation projects and was sponsored by AASHTO, in conjunction with national safety transportation and business associates.

American Recovery and Reinvestment Act Sparked More Projects

The Nebraska Department of Roads (NDOR) was charged with administering significant levels of funding under the American Recovery and Reinvestment Act (ARRA), which President Obama signed into law February 17, 2009 (Public Law 111-5).

The two specific types of ARRA funding for which NDOR is responsible are:

Highways, Roads, Streets and Transportation Enhancements: $235,589,279
(through the Federal Highway Administration, FHWA)

Half of the funds had to be obligated by June 29, 2009, with all of the funds obligated by March 1, 2010. All funds must be expended by September 30, 2015. These funds include the following sub-allocations:

- $157,844,817 for the State Highway System
- $23,240,085 for streets in Omaha and the Metropolitan Planning Area (MAPA) Transportation Management Area (TMA)
- $9,358,051 for streets in Lincoln and the Lincoln-Lancaster County TMA
- $28,088,326 for streets in First Class cities (general population 5,000 – 200,000)
- $9,990,322 for County roads and streets in Second Class cities and villages
- $7,067,678 for Transportation Enhancements (trails, historical facilities, etc.)

On February 24, 2010, a total of 120 projects had been obligated. The Department, along with the FHWA Nebraska Division, counties and municipalities worked together aggressively to meet the March 1 deadline for obligating Nebraska's ARRA funds.

That cooperation actually began in the fall of 2008, in anticipation of, and preparation for, a possible stimulus program from the federal government. All parties understood the challenge to identify projects that could be readied very rapidly, with increased compliance and transparency requirements, the details of which would only be known in the enacted legislation.

NDOR published a list of candidate "Ready to Go" projects on the State Highway System in December 2008, followed by updates of that list in March and May 2009. NDOR published a statewide list of candidate Transportation Enhancement projects in May 2009, followed by an update in November 2009.

Once the statutory criteria were known (February 2009), the Department undertook the following prioritization, in descending order for State Highway System projects:

1. Projects that can be completed in three years.
2. Projects that can be obligated within 120 days and are in Economically Distressed Area (EDA) counties.
3. Projects in other counties that can be obligated within 120 days.
4. Projects that can be obligated within one year and are in EDA counties.
5. Projects in other counties that can be obligated within one year.

The League of Nebraska Municipalities (LNM), the Nebraska Association of County Officials (NACO), and the TMAs likewise developed and published their project selection and prioritization processes. Following further consultation with FHWA and local entities, the Department also decided to advertise, let, award, and maintain administrative oversight of all local public agency (LPA) ARRA projects.

Transit Capital Assistance: $9,811,054
(through the Federal Transit Administration, FTA)

These funds are administered by NDOR for rural programs, meaning transit agencies outside of Nebraska's metropolitan areas. In addition, Omaha/Metro Area Transit (MAT), Lincoln/StarTran, and the South Sioux City portion of Sioux City Transit, collectively received $13.9 million in ARRA funds directly from FTA (no involvement from NDOR). These funds are for purchasing new buses, building bus facilities, purchasing computer hardware and technology for more efficient transit operations, and for employing mobility managers to coordinate transit services.

In June 2009, NDOR announced a first round of ARRA Rural Transit applications totaling $5.3 million in obligated funds. As of January 31, 2010, 29 transit vehicles had been ordered. Work had started on three transit facilities. The NEPA process has been completed for all of the transit facilities being funded by ARRA. One hundred percent of NDOR's ARRA transit funding was obligated by March 5, 2010.

Tiger Grant Program

The Department also applied for discretionary ARRA funding known as TIGER Grants (Transportation Investment Generating Economic Recovery). NDOR submitted five project applications and joined with Iowa for a sixth project application as part of a nationwide competition in September 2009.

The TIGER grant criteria, published in May 2009 by the U.S. Department of Transportation, stipulated that:

- projects must have a significant impact on a metropolitan area, a region or the nation;
- projects must have an estimated cost of between $20 and $300 million;
- projects must be capable of being funds obligated by September 30, 2011, and of completion by February 12, 2012;
- projects only requiring ARRA funds in order to complete the overall financing package will receive priority; and
- the nationwide mix of awarded projects should reflect equitable geographic distribution, including an appropriate balance between urban and rural areas.

Following the September submittal deadline, US DOT announced it had received 1,380 applications, totaling $56.5 billion, for the $1.5 billion appropriated for ARRA TIGER grants. Nebraska's TIGER grant nominations included:

1. New Missouri Bridge, new US-34 Connector between I-29 and US-75, and US-75 Expressway north of the Platte River to Bellevue (Sarpy Co. and Mills Co., IA)
2. US-75 Expressway, Plattsmouth to north of Platte River (Cass Co. and Sarpy Co.)
3. Reconstruction of I-80, Roscoe to Paxton (Keith Co.)
4. I-80 Six Lanes, 56th St. to Waverly (Lancaster Co.)
5. N-133 improvements, north of N-36 (Douglas Co. and Washington Co.)
6. N-370 improvements, Gretna East (Sarpy Co.)

To prepare Nebraska's submittals, NDOR mounted an unprecedented interdisciplinary effort led by Measurements and Long-Range Planning Section in the Planning and Project Development Division. *Unfortunately, no Nebraska projects were selected.*

ARRA also requires extensive public disclosure and reporting, in addition to added reporting to the federal funding agencies. NDOR is required to make various filings and periodic reports to the Office to the Secretary of Transportation, the Federal Highway Administration, the Federal Transit Administration, the Transportation and Infrastructure Committee of the U.S. House of Representatives, and FederalReporting.gov/ the Recovery Act Transparency Board (RATB). Those certifications and most of those reports are available to the public at one or more of these websites:

- www.recovery.gov (federal site featuring quarterly reports on each project of all ARRA recipients nationwide, including NDOR)
- http://testimony.ost.dot.gov/ARRAcerts/ (federal site featuring all states' ARRA transportation infrastructure certifications, including Nebraska)
- http://recovery.nebraska.gov (state site featuring all Nebraska ARRA activities, including NDOR data)
- http://www.transportation.nebraska.gov/ARRA/index.html (NDOR ARRA website).

Road Concerns Expressed During 2009 Statewide Surface Transportation Meetings

Annually, the Department and the Highway Commission holds meetings in each of Nebraska's eight highway districts to discuss statewide surface transportation needs. A variety of information is presented and made available, including information concerning the Statewide Transportation Improvement Plan (STIP). The main emphasis is to receive comments from local officials and interested persons regarding their surface transportation concerns. Public comments are encouraged to let the Department and the Highway Commission know what they would like to see in future roads programs.

At the meetings, newly appointed Director-State Engineer Monty Fredrickson, spoke of the expenditure of tax dollars and the ***major priorities*** established as the Department continues to face great challenges with its highway program.

The ***first*** priority is routine maintenance of pavements, shoulders and bridges, as well as snow and ice removal for the 10,000 miles of highways. The ***second*** priority is directing funds to critical bridge rehabilitation and replacement. ***Third*** is preserving and rehabilitating the existing system of pavements, shoulders and bridges, which will require most of the Department's construction money to accomplish. Completing the six-lane Interstate construction from Lincoln to Omaha is the ***fourth*** priority. Building new facilities and expanding existing highways where traffic volumes dictate when funds are available ranked as the final priority.

Safety

"Move Over" Law Takes Effect

Signs were posted across the state informing drivers of a new law, approved by the State Legislature, which became effective August 30, 2009. The new "Move Over" law requires motorists to move over one lane when approaching first responders with flashing lights providing service alongside high-speed multi-lane highways. Motorists unable to move over due to weather, roadway conditions or traffic congestion must reduce speed when approaching and passing first responders providing assistance.

The law was passed to protect first responders from serious work-related injuries. First responders include: law enforcement vehicles, fire and rescue vehicles, motorist-assistance vehicles, Department of Roads vehicles, and tow trucks or other emergency vehicles stopped by the side of the road. Drivers who fail to move over could be fined up to $100 for a first offense. A second or subsequent offense would carry a penalty of up to seven days in jail and a $500 fine.

Governor Heineman unveils new highway signs.

Interagency Safety Committee Hosts Fifth Safety Summit

In April, highway safety advocates from across the state gathered in Kearney, focusing on the five Critical Emphasis Areas identified in the 2007-2011 Nebraska Strategic Highway Safety Plan (SHSP). The emphasis areas are occupant restraint, impaired driving, younger drivers, intersection crashes and lane departure crashes.

The theme for the event was "Toward Zero Deaths." It was hosted by the Interagency Safety Committee (IASC) of which the Nebraska Department of Roads is a member. Topics presented were: (1) Roundabouts to address intersection safety; (2) How brain development and alcohol affect teenage drivers; (3) Airbag technology and safety concerns for EMS responders; (4) Driver's education and graduated licensing; and (5) Countermeasures for reducing DUI offenses.

Attendees received an opportunity to view or participate in a variety of safety demonstrations. The Nebraska State Patrol's rollover equipment demonstrated what happens in a rollover accident when occupants are restrained and unrestrained. Volunteers were strapped into a "Seatbelt Convincer" to feel the impact of a 5 mph crash. Central Community College's mobile simulator unit gave participants an opportunity to feel what it is like to be behind the wheel of a semi, a fire truck, and a snow plow. The Cooper Racing race car, a partner in the MADD Race Against Drugs, was offered as an educational tool to educate youth and the public on the dangers of drugs, alcohol and impaired driving.

A ceremony recognized the 15 winners of the first annual Governor's Transportation Safety Challenge awards. Winners from the 4 E's – enforcement, engineering, education and emergency were selected based on projects/programs done in 2008 addressing the five Critical Emphasis Areas.

The State Patrol's Seatbelt Convincer gave buckled-up volunteers an opportunity to feel the impact of a 5 mph crash.

Nebraska One of Three States Honored for Leadership to Improve Highway Safety

In October, the 2009 American Association of State Highway and Transportation Officials' (AASHTO) Safety Leadership Award was presented to the states of Colorado, Nebraska and Nevada at the AASHTO Annual Meeting held in California.

The three states selected for the award utilized varied programs and approaches. Each of them demonstrates strong leadership and support of behavioral approaches to improve highway safety through flexing Highway Safety Improvement Program funds, and saw success in reducing highway fatalities and serious injuries.

Highlights of Nebraska's programs are:

- Nebraska sustained its trend in lowering fatalities, from 2005-2008, in part through significant investment in safety projects, including high risk rural road safety improvements. Also, nearly all counties (84 of 93) have participated in a statewide horizontal curve signing initiative.
- In October 2004, the Governor of Nebraska requested the directors from the Nebraska Department of Roads, the Nebraska Department of Motor Vehicles, the Nebraska Health & Human Services, and the superintendent of the Nebraska State Patrol to develop and implement the state's first comprehensive highway safety plan. The four agencies joined forces with the Nebraska Association of County Officials and the League of Nebraska Municipalities to form the Nebraska Interagency Safety Committee (IASC).

  The IASC implemented the state's first Comprehensive Highway Safety Plan in 2006 followed by the current 2007-2011 Strategic Highway Safety Plan (SHSP).
- Nebraska was one of the first states to hold a highway safety summit using a format of speakers combined with breakout sessions to address highway safety concerns. In addition to summits held in 2001, 2003 and 2005, the IASC used the successful summit format for a Critical Strategies Workshop in 2006 to identify strategies for the top five Critical Emphasis Areas (CEA) in the 2007-2011 Strategic Highway Safety Plan.

NDOR Director Monty Fredrickson congratulates Interagency Safety Working Committee Chair Dan Waddle, holding the award.

- The NDOR has taken a unique approach in implementing a "High Risk Rural Roads Program" (HRRRP) by partnering with the Nebraska Local Technical Assistance Program (LTAP), the Nebraska Highway Superintendents Association (NHSA) – an affiliate of the Nebraska Association of County Officials, as well as the Federal Highway Administration, Nebraska Division. Representatives meet monthly to review crash data, develop safety projects and review project proposals from counties.

"The Nebraska Department of Roads, along with our partner agencies in highway safety, emergency responders and motorist education advocates continue to work hard to make safety of our employees, contractors and the traveling public a top priority for all Nebraskans," said Monty Fredrickson, Director – State Engineer of NDOR.

For more information about Nebraska's Strategic Highway Safety Plan go to www.dor.state.ne.us/highway-safety/docs/strat-hwy-sfty-plan.pdf.

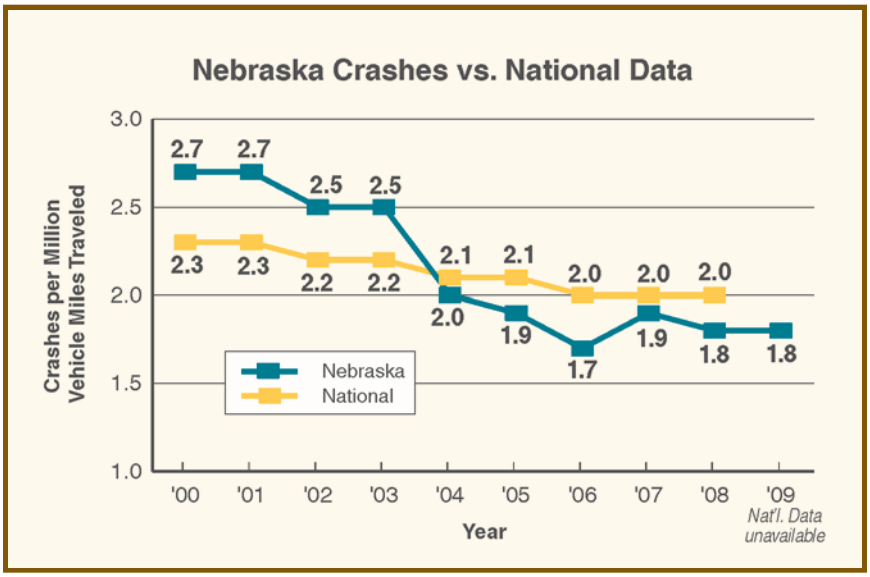
Highway Safety a Top Priority

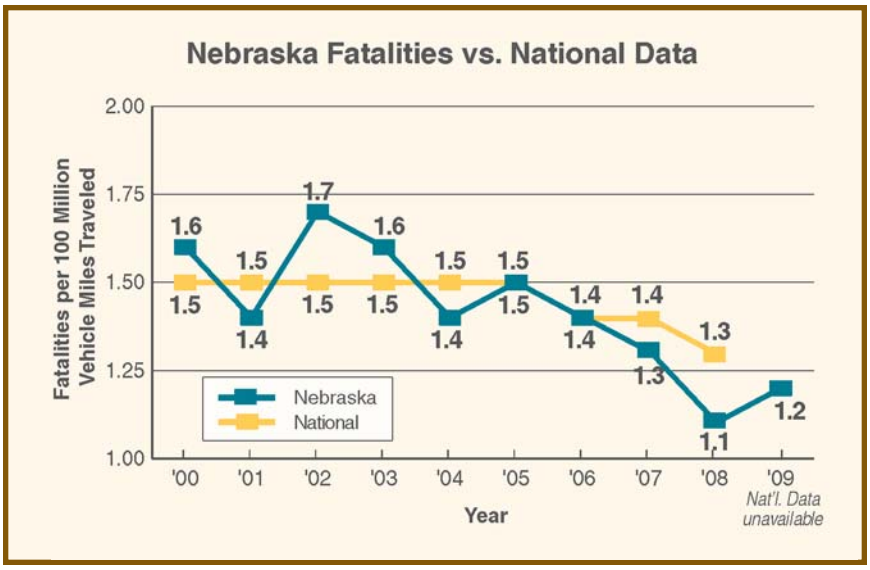
As stewards of the State Highway System, the Roads Department continues to make safety of employees, contractors and the traveling public its top priority. Strong efforts continue to be made to reduce injuries, deaths and economic losses from motor vehicle crashes on Nebraska roads.

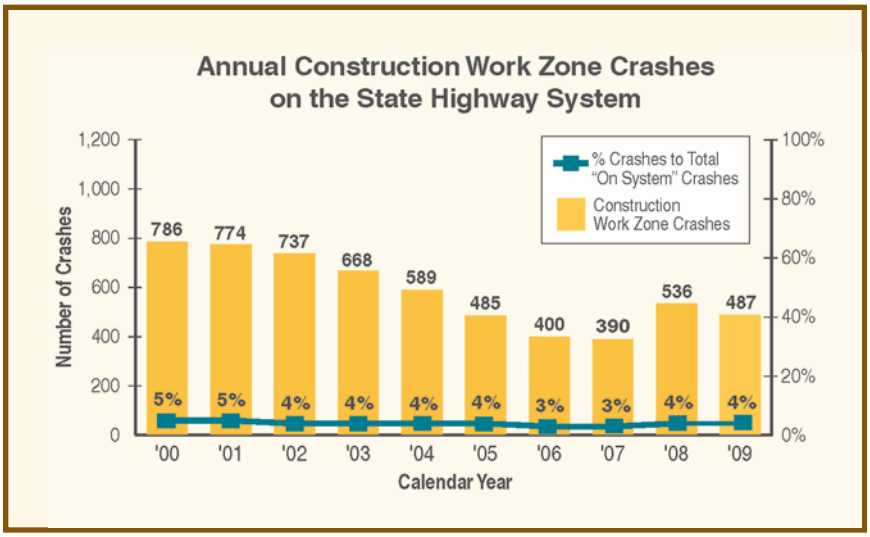
In 2009, there were 19.147 billion vehicle miles of travel on all roadways in Nebraska, an increase of .283 billion from 2008. Efforts continue to minimize crashes and fatalities as highways and bridges are built based to safety standards. The use of advanced traffic devices and evaluation of centerline rumble strips usage are among the efforts to improve safety features.

Reduction in the number of highway fatalities remains a top priority in Nebraska and nationwide. News from the National Highway Traffic Safety Association's report shows motor vehicle fatalities to be at historic lows. Figures show that national motor vehicle fatalities declined from 41,059 in 2007 to 37,261 in 2008. An early estimate predicts 2009 motor vehicle fataities to be 33,963.

In Nebraska, the total number of fatalities for 2009 was 223 compared to 208 in 2008. The fatality rate for 2009 was 1.17 deaths per hundred million vehicle miles traveled, which, except for 2008, was the lowest rate ever recorded in Nebraska.







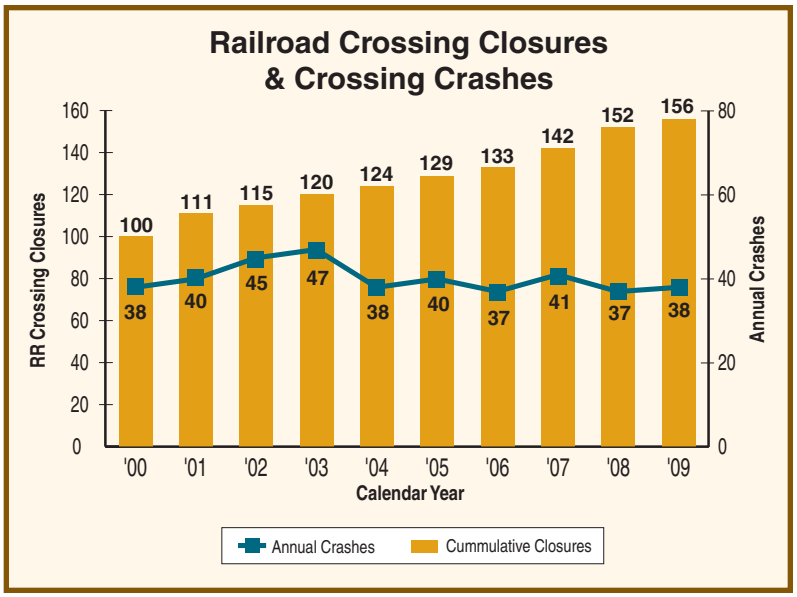
Rail-Grade Crossings

Some highway/railroad crossings in Nebraska have more train traffic than any crossing in any other state. Nebraska has a total of 5,796 railroad crossings:

- 3,119 public crossings
  (230 on state highway system and 2,889 on local roads)
- 2,677 private crossings

Of the 3,119 public crossings, 717 carry more than 40 trains per day.

NDOR's goal is to reduce at-grade railroad crossings and reduce train-motor vehicle crashes and fatalities. Over the past decade, 4 percent of the public railroad crossings have been closed.

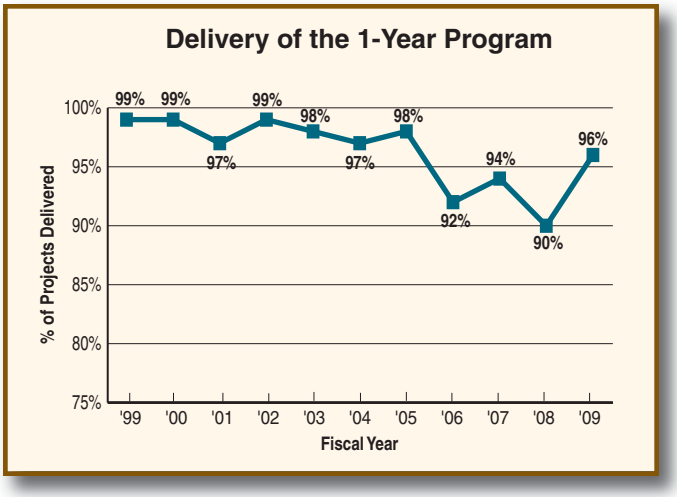


Tracks and new viaduct in Columbus.

Mobility

FY-2010 Surface Transportation Program Plans Announced

The Fiscal Year 2010 Surface Transportation Program, released by NDOR Director Monty Fredrickson, reflects how the Roads Department allocates the taxpayer's highway user dollars to provide the best statewide highway system possible for all Nebraskans and the traveling public.



In his introductory statement releasing the program, Fredrickson stated, "The importance of our state's surface transportation system, not only to Nebraska, but to the entire nation, is an issue greatly appreciated by the Department of Roads. Our economy and quality of life depend upon a well-functioning transportation system. To ensure mobility and reliability, preserving and operating our statewide system has become the NDOR's priority."

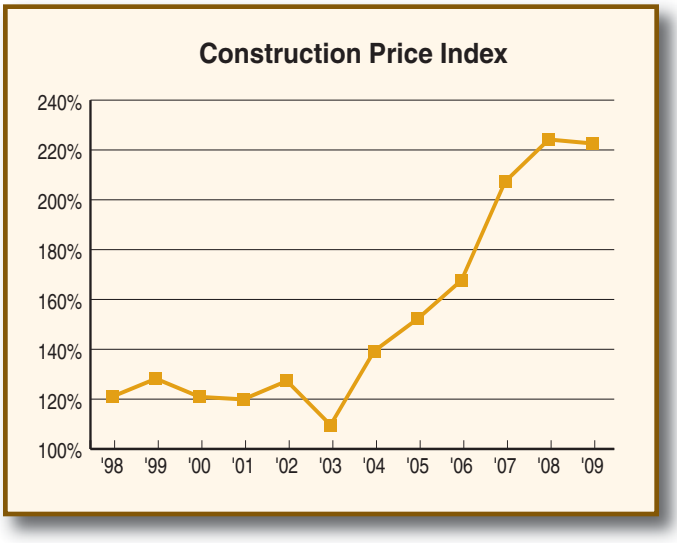
The 2010 Program is published at $487 million and is funded from state and federal highway user fees and included $162 million of federal funds made available by the American Recovery and Reinvestment Act (ARRA) of 2009. The local system program for city streets and county roads totals $327 million and is funded with state, federal and local highway user revenues and included $74 million of ARRA funds.

A total of 152 new projects will be let to contract on the state highway system during FY-2010 (July 1, 2009 through June 30, 2010). Projects throughout the state will range in size from small projects for crack sealing, joint sealing, fog sealing, bridge repair and rehabilitation, traffic signals, intersection modifications and lighting, to large projects such as two- and four-lane grading, resurfacing, surfacing and viaducts to a continuation of six-laning the Interstate system between Lincoln and Omaha and large Missouri River, high priority bridge projects. The complete program book is available at www.transportation.nebraska.gov/hwy-pgm/.

Statewide Construction Price Index

The Statewide Construction Price Index is comprised of eleven categories of construction items that are representative of all phases of highway construction. These categories account for 41.27 percent of the total contract costs awarded during 2009. The base for the index is the 1997 calendar year construction prices being equal to 100 percent in the index.

The index remained relatively stable from 1998 through 2003. From 2003 through 2008 there was a rapid increase in the index and the cost of highway construction in Nebraska. In 2009, there was stabilization in construction costs and the index. The supply and demand for raw materials worldwide has had a direct and dramatic affect on the price we have to pay for highway construction in Nebraska.



Roadway Asset Management Continues Essential Role in System Performance

The Roadway Asset Management Section of the Materials and Research Division has four broad areas of responsibility: **Highway Inventory, County Road Inventory, Pavement Management, and Digilog (Mandli)**. Information maintained by the Roadway Asset Management Section is submitted annually to the Federal Highway Administration (FHWA) on the extent, condition, performance, use, and operating characteristics on all public roads within the state.

2009 Pavement Conditions

Ratings	Interstate System	Non-Interstate System	Total State Highway System
Very Good Miles	179	2,984	3,162
Good Miles	268	4,322	4,590
Fair Miles	27	1,840	1,867
Poor Miles	0	210	210
Very Poor Miles	0	14	14
Total	474	9,370	9,844

All roads open to public travel are reported in the Highway Performance Monitoring System (HPMS) regardless of ownership including federal, state, county, and city roads. HPMS is the official source for this information within the FHWA. The HPMS data are used extensively in the analysis of highway system condition, performance, and investment needs on a national level. The HPMS data is used in the biennial Condition and Performance Reports to Congress. Congress uses these reports in establishing authorization and appropriation legislation, activities that ultimately determine the scope and size of the Federal-aid Highway Program, and determines the level of federal highway taxation. HPMS is a nationally unique source of highway system information that is made available to those in the transportation community for highway and transportation planning and other purposes through the annual Highway Statistics and other data dissemination media.

Knowing that there are changes in needs and capabilities over time, FHWA initiated a reassessment of the HPMS several years ago. The mission of this reassessment was for HPMS to meet the transportation community's data needs in 2010 and beyond. The mission was to respond to current and future business needs, address new data needs in SAFTEA-LU, capitalize on changing technology and, where possible, address resource constraints and institutional changes.

This latest reassessment of the HPMS has been completed. As part of the reassessment, several regional workshops were held across the country to receive input from the states with Roadway Asset Management staff hosting one workshop in Nebraska. Staff participated in several FHWA webinars resulting in the completion of specific problem-solving reports and the development of the Recommendation Report. Roadway Asset Management staff also served on the task force charged with rewriting the HPMS Field Manual.

One measure of the smoothness of roads is the International Roughness Index (IRI). A smoother roadway is safer and more satisfying to the users of our highway system. Our goal is 84 percent of all miles on the highway system will be maintained at an acceptable ride quality of at least "good" or "very good" IRI ratings.

Smoother Pavement

Calendar Year	Interstate System (482 miles)	Non-Interstate System (9,425 miles)	Total Hwy. System (9,907 miles)
2000	90%	80%	81%
2001	94%	84%	84%
2002	94%	84%	84%
2003	92%	84%	84%
2004	92%	85%	85%
2005	95%	86%	87%
2006	96%	90%	91%
2007	97%	90%	91%
2008	99%	91%	92%
2009	99%	91%	91%

In 2009, 91 percent of the total percent of Highway System Miles (see chart) exceeded acceptable Ride Quality IRI ratings. Road smoothness is a performance measure tracked and recorded in data bases maintained by the Materials and Research Division and with the Districts as the activity mangers.

The **Integrated Highway Inventory (IHI)** database was updated with information from 70 construction projects. This data included new roadway geometrics, physical features and reference post information. Lane mile reports and annexation ordinances received from municipalities were used to update corporate boundaries, roadway geometrics and mileage data. This information is used to update and maintain the data relating to the 96,000 miles of roads and streets within the state. A new ramp database in IHI using the Road Global Positioning System (GPS) and construction plans is nearing completion. The database includes roadway geometrics, classifications, locations

and mileage data. This additional data will provide a more complete database for lane mile and mileage reports, along with uses for applications such as allocations of equipment funds for the districts.

The **Local Roads System Database** in IHI continues to be updated with 60 of the 93 counties completed. With each local road/street being identified individually, updating data received from new inventories and local entities will be simplified creating more complete and accurate data. This local road data is used in the State Highway Allocation Fund formula, FHWA allocation (HPMS) and various other reports and requests.

The pavements on the approximately 10,000-mile state highway system were rated, profiled, and perspective photos were taken in order to evaluate its overall condition. Factors such as the extent of pavement cracking, severity of pavement cracking and ride quality are used to complete this pavement condition evaluation of the system. This pavement condition data, along with other pertinent roadway data, can be accessed through the Department's **Pavement Optimization Program** (**POP**). POP also has a life cycle cost module which identifies the 20-year pavement preservation needs. This process includes benefit/cost ratios and annual deterioration rates which are used to calculate the cost to maintain the state highway system at a specified condition level. Candidate maintenance and resurfacing projects are developed through this process and are sent to the district engineer for review. POP is also used to calculate the allocation percentages for the district's annual construction budget. Additional essential statistics are provided for decision making and corporate measures throughout the Department.

Plans are in the final stage for merging the **Digilog System** (**Mandli**, the system that enables individuals to view a highway from their desktops) with the pavement profiling process.

Federal-Aid Local Projects Require Increased Involvement

In April 2009, Local Projects Section was elevated to Division status. The Local Projects Division has worked feverishly, in cooperation with local agencies and the FHWA, to produce over 80 projects valued at approximately $77 million, funded with Federal stimulus money provided by Congress (PL 111-5), the American Recovery and Reinvestment Act (ARRA).

The Local Public Agencies Guidelines Manual for Federal-Aid projects was declared complete on May 20, 2009. A work team comprised of Roads Department personnel and FHWA Division representatives, met often, in lengthy, arduous sessions to hammer out the manual that would be the reference for LPA answers to what, when, how to and what next? www.transportation.nebraska.gov/gov-aff/lpa/lpaguidelines.pdf.

Five training sessions were held for the Responsible Charge (RC) positions during 2009. With NDOR and FHWA assistance, 133 RCs were qualified thru this process. According to Division Head Jim Wilkinson, "It is an absolute necessity for projects involving federal funds to follow the Uniform Relocation Assistance and Real Property Acquisition Policies Act," and that the environmental process needs extra attention as well. "The challenge is to completely address environmental issues while delivering quality projects in a reasonable amount of time."

The year 2009 saw many new procedures, policies and processes being introduced for Federal-Aid transportation projects .

The Department of Roads is actively working with the local public agencies, resource agencies, FHWA and consulting engineers to provide and preserve the transportation infrastructure Nebraskans rely on.

Technology Has Big Role In Efficient Highway System

The Nebraska Department of Roads has been deploying Intelligent Transportation System (ITS) devices for over ten years. We have developed eight District Operations Centers and implemented several forms of ITS technologies across Nebraska. Roadside installations include traffic cameras, bridge anti-icing

Existing ITS Infrastructure

Infrastructure	Omaha	Lincoln	Greater Nebraska
Closed Circuit TV Cameras (49)	22	13	14
Snapshot Cameras (46)	0	14	32
Overhead DMS (46)	17	9	20
Portable DMS (138)	33	29	76
Roadway Sensors (100)	80	20	0
RWIS (60)	4	10	46
Automated Gates (4)	2	0	2
AVL on Vehicles (pilot) (8)	0	0	8
Bridge De-icing Systems (4)	0	0	4

Outside of the portable message signs (DMS) and the Roadway Weather Information System (RWIS) sites, almost all of these devices have been deployed along the Interstate.

systems, overhead electronic message signs and traffic sensors. These roadside installations communicate to their respective District Operations Centers.

More than 90 video cameras have been activated across Nebraska to allow dissemination of data and video imagery from the state system as widely as possible. Via internet, the general public has access to statewide video imagery. Several benefits accrue from this implementation, including:

- Crash reduction
- Informing the public
- Facilitating route choices
- Facilitating the provision of additional traveler information services

Nebraska was the first state to offer travelers advanced road and weather information in segments on a statewide basis when the 511 traveler information number was activated during the winter of 2002. Since that time, travelers have been able to get information on highway surface conditions, site specific weather casts, road closures and restrictions resulting from accidents, incidents of various types, construction work zones and AMBER alerts. The information is available at www.511nebraska.org.

Over the past year, our ITS section has been working to complete and implement the final version of the software product NETworks, used by our District Operations Center personnel. Approximately 240 field operators were trained to use the software for viewing cameras, to post and clear messages from fixed DMS and portable message boards, and to view the information from Roadway Weather Information Systems (RWIS).

Over the next five years the Department has plans to add 20 closed circuit cameras and nine snapshot cameras, replace several message boards, install more roadway sensors, and conduct a pilot test on Highway Advisory Radio (HAR).

As part of our ongoing measures to improve traffic management strategies, RWIS stations are used to measure environmental conditions such as wind speed and direction, air and pavement temperature, and detect types of precipitation. Other technology used are bridge de-icing systems, automated gate closures, automated vehicle locators (AVL), and roadway sensors which monitor speed of traffic flow. Data collected is used to compute travel time, and volume and classification data is for planning and traffic engineering studies.

Overhead Dynamic Message Sign displays an Amber Alert.

Software Meets Business Needs

In 2006, 50 percent of the Department's Automated Right-of-Way Management System (ARMS) was in place. The system, created in 1997, greatly enhanced right-of-way activities through the automated processing of right-of-way design, appraisal and negotiations. Long-term goals are: automated relocation information, automation of payments, developing an excess land inventory, integrating access control and signs system into the ARMS system, and translating data from outside vendors and consultants into the system.

Trns•port (pronounced trans'-port) software is another of NDOR's information system tools for managing Nebraska's Highway Program. Trns•port is an 'off the shelf' transportation management solution with customizable features allowing the software to be specifically designed for NDOR's business needs. This results in a highly integrated system enhancing NDOR's operational efficiency. The Trns•port suite of modules begins with planning and estimation and carries through the development of bidding documents, letting and contract award, and management of construction operations. The software also provides a database of historical capabilities and ad hoc reporting.

Essentially, Trns•port provides a 'cradle to grave' solution for the management of highway construction contracts. The application and the data collected are used in every division throughout the Department and also by many external customers such as the FHWA, contractors, city/county agencies and consultants.

NDOR Districts Using "High-Tech" to Monitor Traffic Conditions

The 2009 year saw the completion of District Operations Centers (DOCs) in each of the Nebraska Department of Roads eight highway districts. Each district can use high-tech equipment to track and monitor weather and travel conditions, providing timely information to emergency workers and motorists.

The DOCs are designed for the safe and efficient movement of vehicles on the highway system. They also are used as emergency operations centers for natural disasters.

While operations centers are relatively new for NDOR, the function has always been performed in each district to some degree. Each district operates differently, depending upon location and population—urban or rural. With the exception of District 2, which operates around the clock, DOCs are activated only when needed and remain open around the clock until the event or emergency is over.

Using projection screens, LCD flat screen and plasma TVs, dynamic message signs, satellite and cell phones and road and weather information system sites, it is possible for each district to orchestrate designated activities for their respective regions.

District 1, in Lincoln, has an operations center equipped with four 42-inch LCD flat screen TVs and a large 6-foot projection screen for viewing camera shots of current travel conditions.

The statewide system of DOCs was designed to enhance communication between the districts, headquarters, other agencies and the public. With this capability, the DOCs will continue to utilize the latest in technology to accomplish NDOR's main goal of moving people and goods as safely and efficiently as possible.

Communication Transportal Takes Users to Source

Nebraska 511 Traveler Information

The 511 system provides information on highway surface conditions, closures and restrictions resulting from accidents, incidents of various types, construction work zones, planned events, AMBER Alerts and timely site-specific weather forecasts.

511 Phone

Total calls recorded into Nebraska's 511 phone system from January 1, 2009 through December 31, 2009 were 807,606. The peak usage day for the 511 phone system and website was December 26. On that Saturday, 108,363 calls came into the Nebraska 511 System, 187,081 unique visitors and 21,353,718 hits on the website were received.

511 Web

On average, 25 percent of visits to the NDOR's website are from people seeking travel information. In a normal month, with no extraordinary weather events, the 511 website averages 14,000 visits. When inclement weather threatens, there is an immediate spike in the number of specific visits to travel.

NDOR's 511 website saw the largest usage in its history in 2009. Over 1,300,000 people visited the 511 website to find current travel conditions. In December, winter storms and blizzard conditions prompted over 700,000 visits, more visits to the 511 web page than in all of 2008.

Note: **VISITS vs. Hits …** We use VISITS instead of "Hits" as it provides a more accurate view of usage. "Hits" count anything that is pulled up to display on the web page. Example: If a person views our 511 page and it has 100 icons on it, the count would show as 100 hits, but only during one VISIT.

Highway Cams

An example of NDOR's highway camera viewing by the public—the week of December 19-27, 2009, showed a little over 114,000 visits.

Twitter

NDOR began using Twitter in March 2009 as another means to steer people to areas on our website for specific information. NDOR Communication tweets timely safety reminders to users who have signed on to NDOR Twitter. Tweets always include a link to a specific area of the website, such as 511, the cameras, our map library, road report for construction sites or other seasonal information.

As handy as it can be for some, Twitter alone is not (technically) reliable enough at this time to be a sole source for information. It is another tool for generating public awareness and providing timely information.

Quick Clearance Road Signs Appear

Motorists on major interstates in the metro Omaha are seeing the appearance of new quick clearance road signs. In an effort to safely expedite the investigation of minor crashes, the Nebraska State Patrol, in conjunction with the Nebraska Department of Roads, will oversee the installation of the new signs.

Quick clearance is the practice of rapidly and safely removing vehicles in non-injury, low damage crashes. The signs, which have been placed along Interstate 80, 680 and 480 corridors will inform motorists to "Move All Accidents to the Shoulder." Besides reducing the probability of a second crash, quick clearance practices are also designed to reduce the time and length of any potential traffic backup, and to increase the safety of incident responders and victims by minimizing their exposure to adjacent passing traffic.

Signs erected along the Interstate in Omaha tell motorists to move minor crashes off the busy roadway.

District Highlights

District 1

Bridges 694
Highway System Miles... 1,575

Maintenance Costs		Construction Costs	
System Preservation	$7,667,118	Interstate	$36,742,000
Operations	6,647,185	Other Highways	50,187,000
Pavement Striping	895,942	**Total Let**	86,929,000
Snow & Ice Control	5,120,251	**Stimulus Funds**	16,106,458

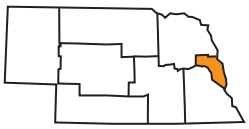
I-80: I-180 - 56th Street, Lincoln

The I-180 to 56th Street construction project is a $48.7 million contract on the northern edge of Lincoln to widen Interstate 80 to six lanes. The work consisted of removing the existing roadway and building three new lanes in each direction. Two new 3-span bridges were constructed over 56th Street. The existing I-80 eastbound bridge over Little Salt Creek was widened to accommodate the addition of the third lane. The work passed through three of Lincoln's major intersections, the I-180 Interchange, the 27th Street Interchange and the 56th St./U.S. Hwy. 77 Interchange. Traffic for the 41,000+ vehicles that use I-80 daily was maintained utilizing the old roadway, temporary pavements and the new pavement.

Work began on schedule in August 2007. The contractor completed the paving of all lanes and shoulders in October 2009 and traffic was shifted from the head-to-head configuration into their respective lanes one year ahead of the original project schedule.

As of December 2009 there are three lanes available for eastbound traffic between I-180 and 56th Street. Westbound traffic has two lanes available between 1-180 and 70th Street. Permanent pavement marking, seeding and electrical work remain to be completed in early 2010.

District 2



Bridges 429
Highway System Miles... 504

Maintenance Costs		Construction Costs	
System Preservation	$1,510,011	Interstate	$22,889,000
Operations	4,301,618	Other Highways	33,650,000
Pavement Striping	460,323	**Total Let**	56,539,000
Snow & Ice Control	4,295,805	**Stimulus Funds**	$16,486,652

Rehabilitation Projects Preservation of US-75 & N-370

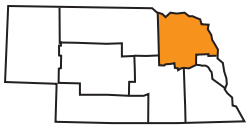
A 9-mile section of US-75 (Kennedy Freeway) between "Q" Street & Platteview Road was repaired at a cost of $1.1 million. This heavily traveled section of freeway between Omaha and Bellevue's Offutt Air Force Base presented considerable traffic control challenges during morning and evening rush hours.

Also, 9.5 miles along Highway N-370 between 26th Street & 138th Street was repaired at a cost of $1.3 million. Due to a public high school in the vicinity, Department personnel manually changed and monitored the traffic signal during school start and end times when lane closures were in the area.

The rehabilitation work for both projects included repairing damaged pavement in both lanes in each direction, diamond grinding the driving lane (right lane) in each direction, cross stitching of all cracks, sawing or routing and cleaning of all pavement joints and cracks prior to sealing and the application of wet reflective polyurea permanent pavement markings.

The US-75 project received the Award of Merit in Concrete Pavement Construction from the Nebraska Concrete Pavement Association. This project is rated the Best in Concrete Pavement Rehabilitation.

District 3



Bridges 603
Highway System Miles... 1,526

Maintenance Costs		Construction Costs	
System Preservation	$8,317,714	Interstate	$ 0
Operations	3,475,048	Other Highways	17,567,000
Pavement Striping	970,516	**Total Let**	17,567,000
Snow & Ice Control	7,302,918	**Stimulus Funds**	8,458

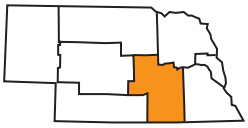
U.S. 81/.U.S. 30 Columbus Viaduct Project

The Columbus Viaduct is the second uniquely designed tied-arch structure in the world. The initial modified design tied-arch bridge was built in Ravenna in 2005. This viaduct consists of a 356′ two-span tied-arch bridge that spans 12 sets of UPRR tracks. The viaduct features three arch sections that support tie rods, tie beams and the roadway structure.

This unique structure has architectural floodlights to illuminate the bridge arches at night. The viaduct also consists of 943.5′ of secondary approach slabs, MSE walls and 10′ pedestrian sidewalks on each side of the four-lane roadway. The substructure consisted of nine drilled shafts 6′, 8′ and 10′ in diameter and ranging in depth from 40′ – 96′ in depth.

This project was bid at $12.9 million, with a contract for 601 calendar days, beginning October 6, 2008, with a completion date to open for traffic on December 5, 2009. The contractor elected to wait until February 2, 2009, when they were allowed to close highways US-30/81 to begin construction of the bridge. The contractor completed the bridge ahead of schedule and received 14 days incentive pay. The project was opened to traffic the day before Thanksgiving.

District 4



Bridges 626
Highway System Miles... 1,714

Maintenance Costs		Construction Costs	
System Preservation	$10,293,363	Interstate	$15,253,000
Operations	5,861,321	Other Highways	38,921,000
Pavement Striping	845,707	**Total Let**	54,174,000
Snow & Ice Control	3,469,985	**Stimulus Funds**	21,490,799

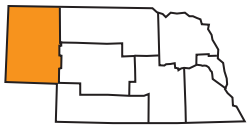
Odessa – Kearney (WB)
Pavement Construction on Interstate 80

This $11.3 million project is located on Interstate 80 from Reference Post 263+31 to 272+22. The 8.9-mile project consisted of removal of the existing asphalt overlay and concrete pavement which was replaced with 13-inch doweled concrete pavement. Crushing of the concrete removals was incorporated into the new construction as concrete foundation course. The contractor utilized a portable concrete batch plant and slip form paver to construct the new pavement.

The westbound rest area also had the existing pavement removed, new drainage structures built, new concrete pavement placed, and new sidewalk and ADA curb ramps constructed. The project was open to the traveling public in November 2009. In spring 2010, construction of rumble strips, permanent seeding and pavement marking will be done to complete the project.

Nearly 175,000 sq.yds. of 13-inch doweled concrete pavement, and 50,000 sq.yds. of 10-inch concrete pavement were slip form paved on this project.

District 5



Bridges 383
Highway System Miles... 1,248

Maintenance Costs		Construction Costs	
System Preservation	$4,372,899	Interstate	$ 3,569,000
Operations	3,807,719	Other Highways	22,977,000
Pavement Striping	737,174	**Total Let**	26,546,000
Snow & Ice Control	4,657,704	**Stimulus Funds**	16,097,019

Highway 27 – I-80 – Garden County Line

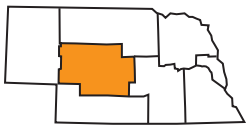
Waste not, want not, is an adage that one frugal generation passes on to the next. The asphalt industry has acted on this advice and for years incorporating recycled pavement back into Nebraska highways. Dustrol, Inc. has taken this thought process one-step further in their development of the "Hot-in-Place recycling." They have used this process extensively in neighboring states, but had not used this new version in Nebraska.

Having a new technique is only half of the equation; in order to have success we also had to select the proper project, because even the best techniques will fail if improperly applied. NDOR combined the refined process advanced by Dustrol, Inc. with the pavement on Nebraska Highway 27. The existing pavement condition, combined with the traffic volumes made this an ideal candidate for this process and provided the best opportunity for success.

The process involves a series of machines with heaters and a small mill head that removed the softened asphalt surfacing. Four of these combination heater/mills run in close series to each other along with four stand alone heaters ultimately involving the top 1.5 inches, and introduce additional oil specifically designed to rejuvenate the pliability of the material before placing the mixture into a traditional paving machine. The next steps include placing and compacting the material using traditional methods and covering with a protective armor coat.

This experimental project will determine ultimately, how cost effective this strategy is in the long term; however, the initial data is promising. This very clean and fast process does not require a plant site or mountains of additional aggregate and large volumes of other raw materials. It is encouraging to see companies viewing today's uncertain economy as an opportunity to be innovative and provide its customers with a quality service that is competitive with more traditional methods.

District 6



Bridges 352
Highway System Miles... 1,292

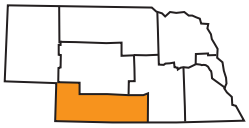
Maintenance Costs		Construction Costs	
System Preservation	$6,457,505	Interstate	$ 2,913,000
Operations	4,954,124	Other Highways	32,489,00
Pavement Striping	840,047	**Total Let**	35,402,000
Snow & Ice Control	2,945,187	**Stimulus Funds**	15,980,636

State Farm Road North, North Platte

This System Preservation project consisted of removal of the existing concrete pavement and asphalt shoulders from I-80 intersection to just north of intersection of State Farm Road and replacement with 9" doweled concrete and 9" concrete shoulders. This four-lane section of concrete pavement on US-83 had served the traveling public well for more than 35 years. The project consisted of grading, concrete pavement, culverts, bridge remodeling, electrical and general items at a cost of $3.6 million.

Improvements included construction of 45,760 sq.yds. of 9" doweled concrete pavement with 10,631 sq.yds. of 9" concrete tied shoulders. Drainage structures were installed in and around the intersections to improve water runoff issues. The placement of permanent street lighting from Walker Road to State Farm Road and the addition of turning lanes were great public safety improvements. Upgrading the traffic signals, permanent pavement marking, grading, erosion control and miscellaneous items were also a part of the overall project improvements.

District 7



Bridges 289
Highway System Miles... 1,029

Maintenance Costs		Construction Costs	
System Preservation	$5,055,094	Interstate	$ 0
Operations	2,968,855	Other Highways	10,122,000
Pavement Striping	420,215	**Total Let**	10,122,000
Snow & Ice Control	1,356,185	**Stimulus Funds**	0

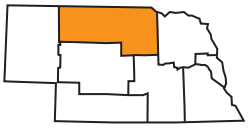
U.S. 34 – Stratton to R-44B

This $3.6 million project on US-34 began at the east edge of Stratton and extended 8.5 miles east to the intersection of R-44B (the road across the Trenton Dam). The project began in June and finished in October.

The existing asphalt surface was recycled using a cold-in-place strategy. With this strategy, the existing pavement is removed, processed with hydrated lime slurry, and replaced to make a four-inch base course material for the new pavement. Then three inches of SP-4 asphalt was applied. The project also replaced an expansion joint at the Camp Creek Bridge and updated guardrail on the project.

Traffic was maintained during construction utilizing flaggers and pilot car. The project was completed eight days sooner and for $469,000 less than the original contract.

District 8



Bridges 136
Highway System Miles... 1,062

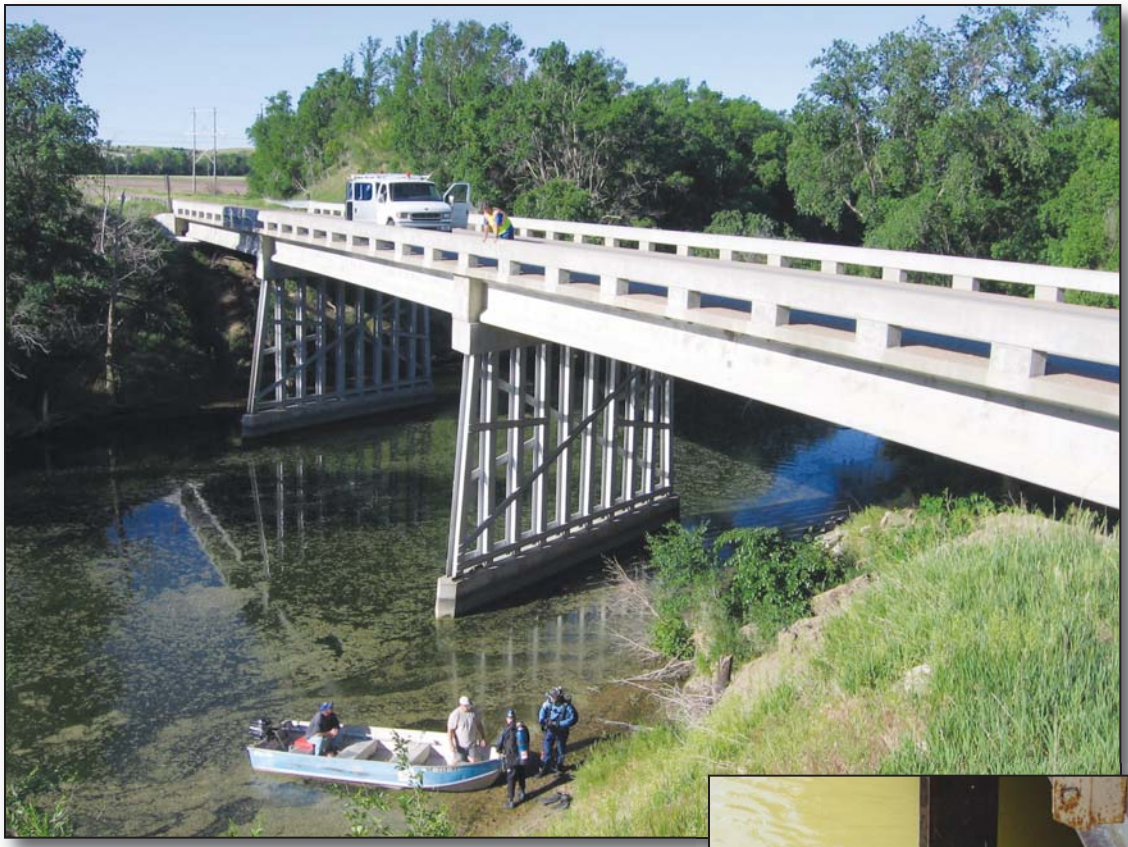
Maintenance Costs		Construction Costs	
System Preservation	$4,768,532	Interstate	$ 0
Operations	2,644,049	Other Highways	8,472,000
Pavement Striping	1,417,332	**Total Let**	8,472,000
Snow & Ice Control	1,975,817	**Stimulus Funds**	2,135,795

U.S. 281 – Chambers Jct. North

This $6.9 million project is located on Hwy. 281, south of O'Neill. The project consisted of 10 miles of asphalt paving that included the addition of 8' surfaced shoulders, 17 roadway culvert pipes were replaced with concrete pipe, a shoofly to maintain traffic during the construction of a new 110' IT-concrete girder bridge and a triple 10'x8' concrete box culvert, 7,000 cu.yds. of composted manure was partially incorporated into the earth shoulders 6' to 8' wide to promote vegetation growth due to the sandy soil in this area, and a turning lane along with roadway lighting was installed at the junction of Hwy. 281/95.

Environmental commitments: Standard erosion control measures were implemented to comply with the project 404 Permit, SWPPP compliance, project clearing and grubbing was performed outside of the nesting season in compliance with the Migratory Bird Treaty Act. Conservation measures were enforced to protect the American Burying Beetle until the successful completion of a capture/relocation procedure in June. Twenty-nine acres of wetlands were constructed adjacent to an existing 26-acre wetlands area, which was constructed on a previous project.

Note: With the completion of this project, all 8' surfaced shoulders on the required highways in District 8 are now complete.



County bridges must get rated for load capacity.

Diver inspecting underwater bridge elements.

All Bridge Sized Structures in State Accounted For

Federal regulations require the Department of Roads to be responsible for the inspection and load rating of all bridges within the borders of the state.

Although the Department is not required to perform these activities, it is responsible to see that these activities are appropriately accomplished. As a part of this responsibility, the Department has sponsored training of local bridge inspectors to certify them as qualified bridge inspectors, as required by federal regulations.

There are 15,358 bridge sized structures in Nebraska, 3,511 on the State highway system, 11,453 on the County and Municipal system and 394 in Cities and Urban areas. All of these bridges required an updated load capacity rating and some required special, hands-on inspections or special hydraulic studies.

The Department made extensive use of consultants who were experts in the areas of bridge structures and soil erosion to supplement existing staff in accomplishing this task.

The Department of Roads' Bridge Division, in conjunction with local governments and the Federal Highway Administration, have been working on bringing Nebraska's inventory of bridges into complete compliance with federal rules and regulations. This effort included the timely inspection of every bridge in the state that is open to the public and is over 20 feet long.

As part of this process, the Bridge Division, with the assistance of consultants, have completed a comprehensive bridge inspection manual that contains policies and procedures to assist bridge owners and inspectors in properly inspecting and managing Nebraska's bridges. In addition, the Department has supplied local governments with special software to assist in the inspection of bridges and for collection of required information on each bridge.

All of this activity is aimed at ensuring that Nebraska's bridges are safe for the public. Bringing the condition and load capacity ratings of substandard bridges up to an acceptable level will be an ongoing challenge for the Department of Roads.

Environmental Stewardship

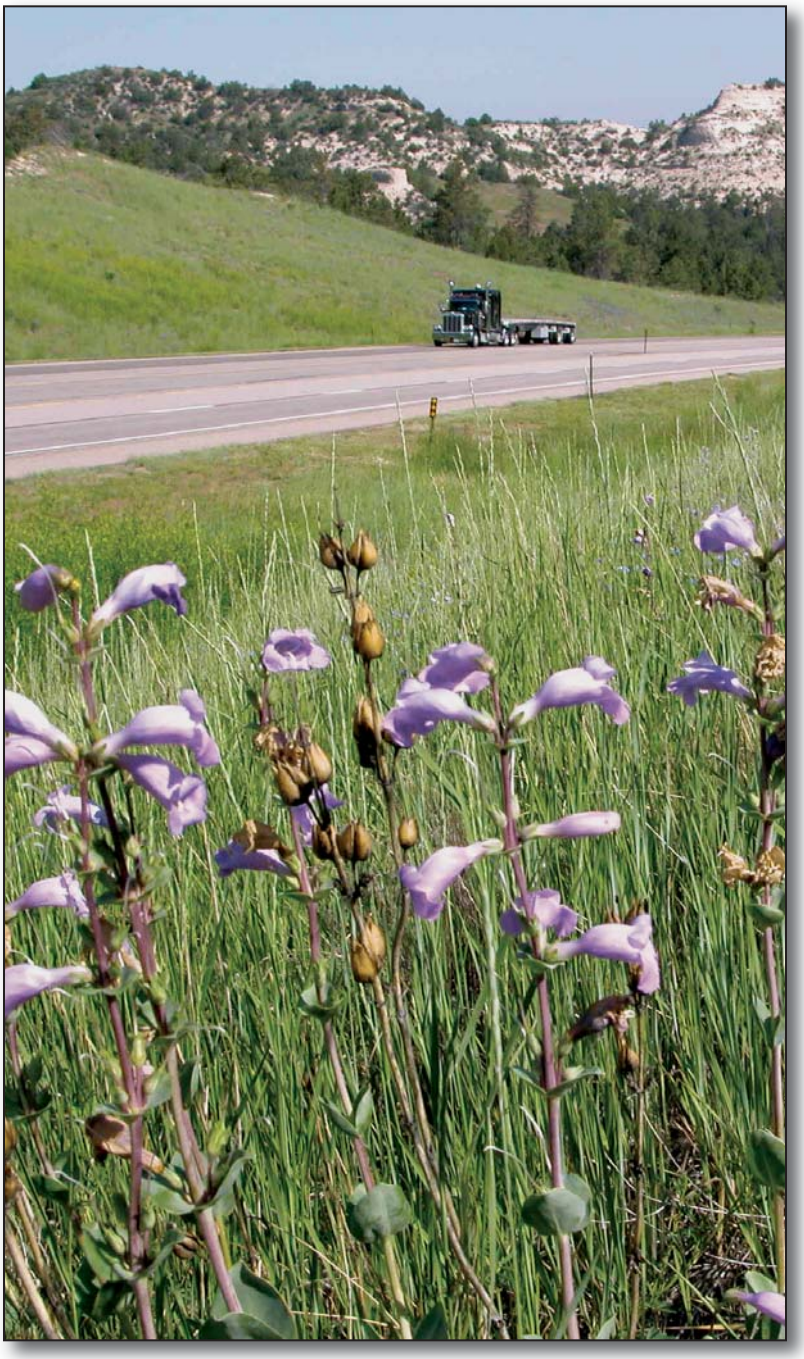
NDOR Receives Environmental Excellence Award

In September, the Nebraska Department of Roads received an award for Excellence in Roadside Resource Management and Maintenance from the Federal Highway Administration during an international conference in Duluth, Minnesota. The award recognized NDOR's Plan for the Roadside Environment, which promotes the increased use of native planting and vegetation management to provide a sustainable roadside.

The plan emphasizes the use of native planting adapted specifically to the varying climate zones across Nebraska, and contains sections for each of the six landscape regions across Nebraska. Each individual landscape section contains regional maps and summarizes a variety of ecosystem information for the region, including hydrology, climate, soil and plant communities, as well as regional history, land use and economic features.

The plan is applicable to the entire state and includes landscaping objectives for integration into transportation planning, safety, design and operation of the system. These objectives inform NDOR and natural resource agencies concerning the role of the roadside environment and how to achieve good stewardship and maintenance of a unique and sustainable "Nebraska-style" landscape.

The Federal Highway Administration's biennial Environmental Excellence Awards Program recognizes the organizations, projects and people that forge creative solutions and innovations for balancing the needs of a safe and efficient transportation network with environmental sensitivity. The program recognizes excellence in diverse categories, including Roadside Resource Management and Maintenance, Environmental Research, Context-Sensitive Solutions and Environmental Leadership.



Wildflowers adorn Nebraska roadsides.

New Roadside Flowers and Grasses Brochure Developed

The Nebraska Department of Roads Roadside Stabilization Unit developed a new brochure for distribution to the public. The "Discover Nebraska's Roadside Flowers and Grasses" brochure features color photos of flowers and grasses that are included in NDOR's seed mixtures or may be growing naturally in the state's right-of-way.

The goal of this brochure is to provide the public with a quick and colorful reference for the most commonly found plants on Nebraska's roadsides.

The new brochure replaced the "Wildflowers and Grasses along Nebraska Roadsides" brochure, which served curious travelers for a number of years. The new brochure is available for download or viewing at www.transportation.nebraska.gov/docs/flowers.

"Going Green" Efforts Part of NDOR'S Activities

With much emphasis being given to environmentally friendly "Going Green" activities, transportation agencies across the nation are doing their part in the important energy conservation, pollution reduction and money-saving program.

While global warming is generally associated with "Going Green," other broader references are made whereby there is a heightened awareness of using Earth's resources more efficiently. Conservation of natural resources is the key so that "Going Green" emphasizes reducing waste, reuse what you can and recycle what you can't.

The Nebraska Department of Roads has and will continue to be involved with "Going Green" practices. Here are examples of what's happening within the Department:

LED Cuts Costs

Traffic Engineering Division has been in the process of converting incandescent traffic signal sections to light-emitting diode (LED) sections. Twenty-five section left-turn heads, 351 pedestrian heads and 1,630 signal sections will be replaced. In theory, the signal sections are 150 watt bulbs and the pedestrian heads are 116 watt bulbs. The LED replacements average about 10-15 watts each. Electric power costs for signals will be reduced with this action.

Soy Base and a Grant

Traffic Engineering's Sign Shop is using a chemical called Methyl Ethyl Ketone (MEK) in a screen cleaning machine to remove ink from screens after printing. MEK is a very hazardous chemical that is carcinogenic. Existing methods require the use of an air make-up unit to circulate clean air into the area from outside. The screen cleaning machine will be replaced with a machine that uses a soy-based product that is biodegradable, is not carcinogenic, does not evaporate, requires less chemicals, costs less in energy consumption, and does not require the air make-up unit. To help cover the cost of the new screen cleaning machine, a grant will be applied through the Nebraska Department of Environmental Quality Office.

Reduce, Recycle, Reuse

The Sign Shop continues to recycle all capable items that can be recycled. The section is working to develop a waste reduction plan that focuses on their goal, source reduction, recycle and reuse policies, energy efficiency and training.

Recycled Pavement Pays

Optimizing Recycled Asphalt Pavement (RAP) in asphalt mixes has produced significant savings. During the 2007 construction season, using 6.85 percent RAP resulted in the use of 6,004 tons less binder and 111,178 tons less aggregate for a total savings of $3,647,750. Preliminary figures available for the 2009 construction season reflect using 26.5 percent RAP resulted in the use of 29,746 tons less binder and 550,847 tons less aggregate, with a savings of $22,612,423.

Mix Crumb Rubber

First used in 2001, the Department is using a type of asphalt-rubber overlay containing crumb rubber from recycled tires. It is commonly known as Rubberized Asphalt Concrete (RAC) and is cost efficient and an environmentally friendly alternative to traditional road paving. The United States generates 281 million scrap tires annually with 300 million in stockpiles and 498 million in processing facilities. The noted numbers are very important for use in asphalt since each tire has the equivalency of 7 gallons of oil. To date, NDOR has utilized over 5.3 million pounds of crumb rubber in its asphalt mixes.

Shingles to Shoulders

Recycled Asphalt Shingles (RAS) are also being used in the Department's SPS shoulder mix. Using RAS reduces the amount of shingles entering our landfills, thus extending the landfill's lifetime capacity. With the allowance of 10 percent RAS in the Department's SPS mix, estimated from 200,000 to 400,000 tons, a savings of $3,000,000 to $6,000,000 may be realized each year.

Saving Energy

The Department has completed two Warm Mix Asphalt (WMA) projects. This process takes Hot Mix Asphalt and uses a modifying agent to allow asphalt to be produced, placed and compacted at 50°-100° F lower than typical Hot Mix Asphalt. Heating asphalt to a lower temperature has resulted in an energy savings of 10 to 40 percent. In addition, lower asphalt temperatures reduce emissions and improve work environment. Studies have shown that WMA reduces levels of carbon dioxide, sulfur dioxide and nitrous oxide during the production and construction of an asphalt road.

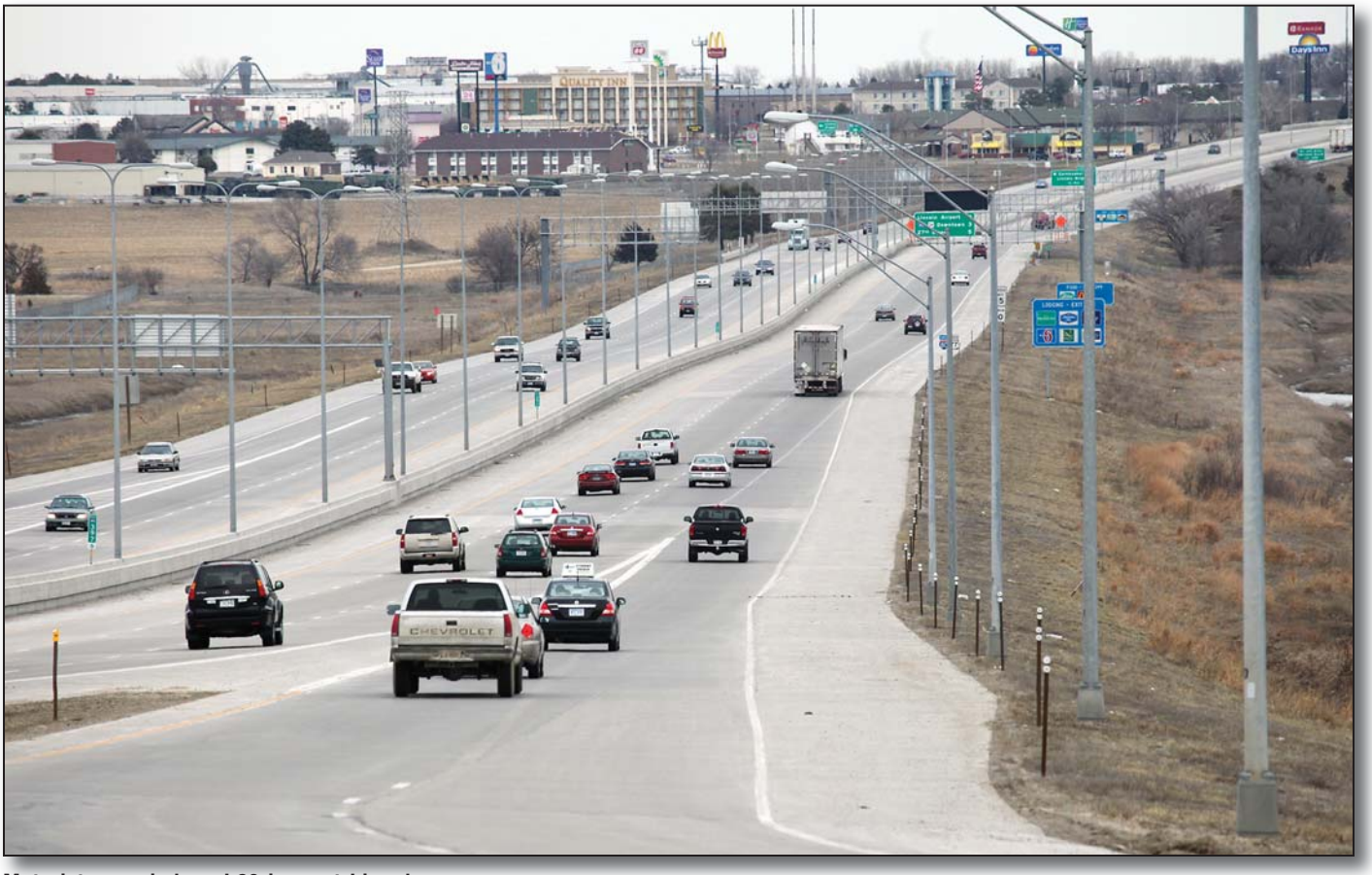
Using Old Concrete

For the last 10 years, Nebraska has been utilizing its existing concrete in many of its reconstruction projects. The existing concrete is often used as a foundation course. Foundation course is a layer of rock under the pavement that helps drain away water, provides uniform strength, and gives contractors a stable platform for their heavy paving machines. The concrete is broken into pieces that are hauled off site to a plant that processes the material into the correct gradation. The crushed rock is then hauled back to the project site and placed onto the roadbed, compacted, and is ready for the placement of pavement on top of it. This process is environmentally friendly since 100 percent of the old concrete is reused on the new roadway.

The Department is now taking the process a step further. Mobile crushers allow for the existing concrete to be crushed next to the roadway. This removes the added cost of dump trucks hauling the material to a separate site and then hauling it back after the process. It is estimated that this process will save about 20 percent in the cost of foundation course processing. The Department is hopeful that this option will be available to contractors in 2010 on certain I-80 projects.

Save the Landfills

The Nebraska Department of Roads is a member of ***Keep Nebraska Beautiful***, an organization that works together with other agencies, businesses and industries to keep useable materials out of landfills. They have exchange programs where they work together seeing if other agencies can use materials such as barrels, paper, glass, rubber and many other items that would eventually end up in landfills. In FY-2009, $73,338 in payments were received for used oil, milling, scrap metal and aluminum.



Motorists on six-lane I-80 in west Lincoln.

Research

Research in Progress

Investigation and Mitigation of Driver Confusion at Modern Roundabouts

While roundabouts continue to spring up around the country with statistics showing they improve intersection safety, questions arise as to whether drivers know how to correctly navigate them. Through surveys and video monitoring, it was revealed that the main area of confusion for drivers is how to signal when entering and exiting a roundabout and what to do when encountering emergency vehicles when at a roundabout.

The Nebraska Driver's Manual does not give much information on how to correctly maneuver a roundabout. UNL is currently working with the Department of Motor Vehicles to improve the manual's guidance on roundabouts.

In-House Research

- **Blended Aggregate Gradations for Nebraska 47B Concrete**

  The Nebraska Department of Roads began to explore various blended aggregate gradations for the Nebraska 47B concrete in January 2008. The purpose of this research is to optimize aggregate blends utilizing more locally available materials. These blends are being evaluated for mechanical and durability characteristics for paving mix designs. The outcome of these evaluations should result in the introduction of a new aggregate grading band 47B Revised (47BR), which would allow the use of more locally available materials currently being produced in the state, thereby optimizing its economy. A couple of projects in this year's construction season will be used to evaluate the properties and performance of the blended aggregate gradations on a full scale project.

- **Pile Driving Analyzer Accuracy**

  For 20 years the Nebraska Department of Roads has been testing piling with a Pile Driving Analyzer (PDA). One of the material properties needed to properly test a pile is the Modulus of Elasticity.

  Research in progress addresses the modulus calculations with steel piling, where the modulus has been considered constant, versus the modulus for concrete piling, which is dependent on the mix design and concrete strength and when compared to the textbook empirical equation is much higher.

  Research will verify the results of the PDA accuracy which will give the operator a better starting point when estimating the modulus in the field. While the testing has not been completed, an appearing trend indicates that along with the time dependent increase in compressive strength, there is a time dependent increase in Modulus of Elasticity. When a PDA operator is testing a concrete pile, they should take into consideration the age of the pile, which in many instances can be 1 to 2 years old, when entering the initial modulus value.

Research Completed

- **Implementation of Conductive Concrete Deicing**

  The search for improved deicing methods has been a research focus around the country for quite some time. This research project investigated the use of electrically conductive concrete to heat the pavement so as to prevent ice formation on the pavement surface when the power source is turned on. The Roca Spur Bridge near US-77 was the test bed for the 5-year evaluation. The conductive concrete performed well under most weather conditions, keeping the bridge free of ice. At the present time, there are no plans to duplicate the conductive concrete system, but the Department will continue to monitor its performance.

- **Ultra-High Performance Concrete**

  Ultra-High Performance Concrete (UHPC) is a new class of concrete that has superior performance characteristics compared to conventional concrete. This is due to the optimized particle gradation that produces a very tightly packed mix, extremely low water-to-powder ratio, and the use of steel fibers. UNL researchers worked on creating a more economical mix that still obtained a compressive

strength of 18 ksi (kilo-pound (force) per square inch). To do this, the steel fibers were eliminated and grade 80 ksi welded wire reinforcement was used instead to substitute for the loss in tensile/shear capacity. The results of the laboratory tests and the full-scale girder tests indicated that the developed mixes are attainable using practical and affordable mixing and curing procedures.

- **American Burying Beetle (Phase 2)**

  The American Burying Beetle is an endangered species that is found in central and northern Nebraska. In areas where the beetles will be disturbed through construction, the U.S. Fish and Wildlife requires either a "bait-away" or "trap-and-relocate" procedure. Sometimes, the "trap-and-relocate" process can limit construction activities until after July each year, when the beetles are active. This research looked at what type of soil the Burying Beetle is attracted to and what months they are active. It was found that the beetles seek moist soils during periods of inactivity, likely for replenishment due to their high water loss rates. With this information, it is hoped that a reduction in soil moisture levels before a construction project begins will deter the beetles from habituating.

New Research Projects

- **Materials, Pavement and Maintenance**

  Maximizing HMA Durability Through Efficient Use of Non-Nuclear Density Gauges and Situational Rolling Methods – This study will evaluate current testing of soil and HMA densities and try to find alternatives to Nuclear Gauge testing, hopefully, eliminating the high cost of Nuclear Gauge training and storage.

  Development of a Method for Performance Rating of Deicing Chemical for Winter Operations – This research study will create a performance rating system of deicers for NDOR, ensuring that the best chemicals are being purchased.

- **Roadway, Hydraulics and Environmental**

  American Burying Beetle - This research study will investigate the "bait away" methods for conservation of American Burying Beetles, which could help reduce delays in construction due to this endangered species.

  Fertilizer Effects on Attaining Roadside Vegetation Requirements - This study will provide NDOR with field data of different fertilizer application rates and their success. This data will help enrich vegetation growth and reduce erosion control costs.

- **Traffic, Safety, Planning, Transit and ITS**

  Effects of Phase Countdown Timers on Safety and Efficiency of Operations at Signalized Intersections – This study will look at how countdown timers effect safety of pedestrians and vehicular traffic, as well as how the countdown timers may improve efficiency of vehicular traffic flow.

  Evaluation of the Potential for Using Video from Roadway Monitoring Cameras to Supplement Data Collection - This project will equip existing roadway monitoring devices to allow the collection of traffic data.

- **Structures and Geotechnical**

  Load Rating of Complex Bridges - This research will provide Nebraska with more precise load ratings for complex bridge structures.

  Bottom Flange Reinforcement of NU-I Girders - This research will investigate the effect of the difference between the NDOR and AASHTO LRFD specifications on the bottom flange reinforcement detail.

Financial Overview

Net Asset Value

The net asset value of an organization is very important to its employees and its owners, which in our case, are the residents of the State of Nebraska. NDOR's net assets (pavements, bridges, right-of-way) are valued at approximately $7.6 billion.

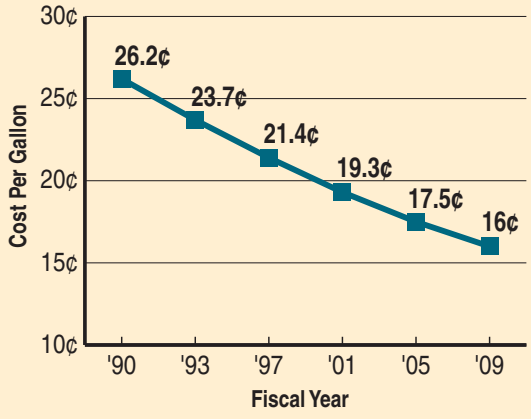
Surface Transportation Financing

Nebraska plays a major role in moving people and goods throughout the state and nation. Our economy and quality of life are very dependent upon a well-functioning transportation system.

In recent years, inflation has significantly eroded the purchasing power of the dollar. However, the recession has slowed, or diminished inflation for the near term, but it is inevitable that as recovery begins, inflation will once again begin to rise. In many states and from a federal perspective, the ability to compensate for inflation or deflation has not worked very effectively, based on the structure of traditional highway user revenue sources.

Gas Tax Buying Power

Over 63 percent of all state revenues are derived from taxes on motor fuels which averaged 26.2¢ per gallon in 2009. The buying power of the 26.2¢ motor fuel tax in 1990 has declined to just over 16¢ in today's dollars. Stated another way, $1 in 1990 would only be worth 61¢ today.



State highway user revenues remain stable to declining. Were it not for Nebraska's variable fuel tax, state fuel tax revenues received by the Department of Roads, would have significantly declined. While the number of gallons of fuel sold continues to decline, the variable fuel tax is adjusted to ensure that the appropriation level established by the Legislature, for the Department of Roads, is met. The sales of motor vehicles continue to decline; correspondingly, State sales tax revenues from the sale of vehicles also are declining.

The level of federal highway funding remains a big question mark and the future is still very uncertain. Congress is faced with the following issues: (1) the five-year transportation legislation known as SAFETEA-LU, expired on September 30, 2009, (2) a new reauthorization transportation bill has not been passed by Congress and it is uncertain when that will occur, (3) the liquidity of the Federal Highway Trust Fund remains in question, and (4) where the revenue will come from and the level of funding for long-term reauthorization remains highly uncertain.

With all the funding uncertainties, the size of our State Highway System construction program likely will continue to decline over the next two years. Our first priority is to preserve and maintain the $7.6 billion investment we've made in the existing infrastructure. With funding at the current levels, we are essentially in the preservation and maintenance mode. The size of our construction program will have dropped from $390 million in FY-06 to approximately $310 million in FY-11.

The federal American Recovery and Reinvestment Act (stimulus) of 2009, provided $162 million for projects that were added to the FY-10 published construction program. Unless a second stimulus, or "jobs" bill is passed by Congress, the size of our FY-11 construction program will approximate $310 million.

In the past 20 years, motor fuel consumption in Nebraska has increased only 26 percent while vehicle miles traveled (VMT) on the State Highway System only, has increased over 37 percent. Stated another way, highway usage has increased at a much faster rate than the revenue generated to support that system.

Revenues

55% State | 40% Federal | 5% Local

Expenditures

1% Public Transit & Rail | 73% Construction | 20% Maintenance | 6% Services & Support

Revenues

State Funds - State revenues provide 55 percent of our transportation financing. Highway-user fees and taxes generate the largest portion, approximately 95 percent. These fees and taxes are: fuel taxes, sales tax collected on purchases of new and used motor vehicles, and motor vehicle registration fees. The fees and taxes are deposited into the State Highway Trust Fund, distributed to the Highway Cash Fund, and used specifically for surface transportation. Changes in the level of yearly state revenue normally represent the increased or decreased consumption of motor fuel and purchases of motor vehicles.

Federal Funds - Revenue received from the federal government, 40 percent, is the second largest source of funding. Federal revenue is the return of fuel and excise taxes that are levied at the national level. These taxes are collected and deposited in the Federal Highway Trust Fund and then a portion is returned to the state through the Federal Highway Administration. These funds are used on eligible projects in all areas of the state.

Local Funds - Revenue received from local governments represents 5 percent of the total NDOR revenue. Local revenues are funds contributed by cities and counties for their share of construction projects. These funds match federal-aid revenues and are used for local roads and street projects that are administered by NDOR.

Expenditures

NDOR spent $708 million in FY-2009 to move people and goods across and throughout the state by means of a safe and reliable surface transportation system.

- Approximately 73 percent of the Department's expenditures were for surface transportation construction. Much of our construction expenditures are for system preservation of the existing $7.6 billion infrastructure.
- Approximately 20 percent of total expenditures were spent on routine maintenance activities that include: mowing, snow removal, ditch cleaning, litter pickup, sign and signal repairs, striping, guard rail repairs, pothole patching, etc.
- Only 6 percent were spent on services and support, i.e. administrative salaries, computers, office furniture, engineering and technical equipment. Expenditures for administrative costs are one of the lowest in the nation.
- Expenditures of 1 percent of the total were for public transit and rail functions that are administered by NDOR.

Transportation Costs

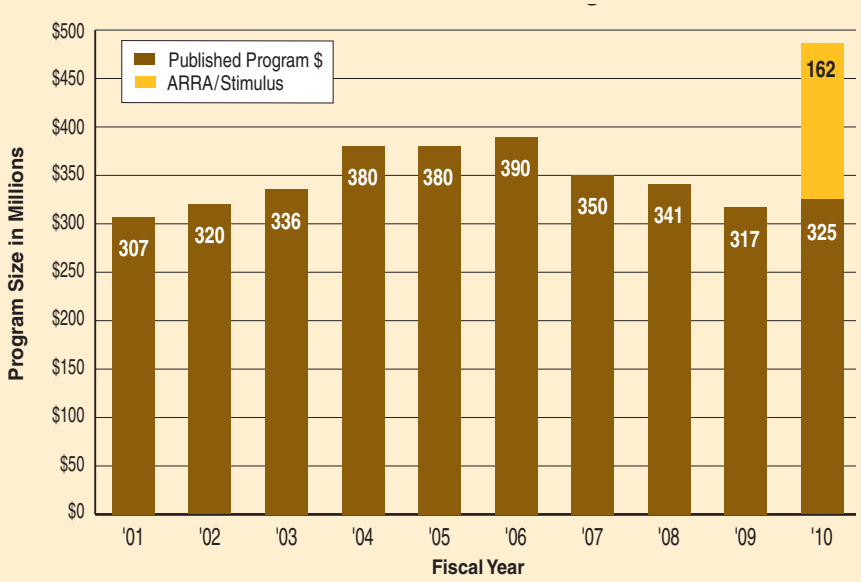
According to the American Automobile Association, the average operating costs for a vehicle that travels 10,000 miles annually is 73.9 cents per mile. Taxes and fees are only 9.1 percent of the total expenditures to own and operate a vehicle.

Taxes	Fuel*	Financing	Depreciation	Repairs	Insurance
9.1%	17.8%	12.6%	36%	8.4%	16.1%

** Fuel costs based on $2.60 per gallon, the late 2009 U.S. price from AAA's fuel gauge report.*

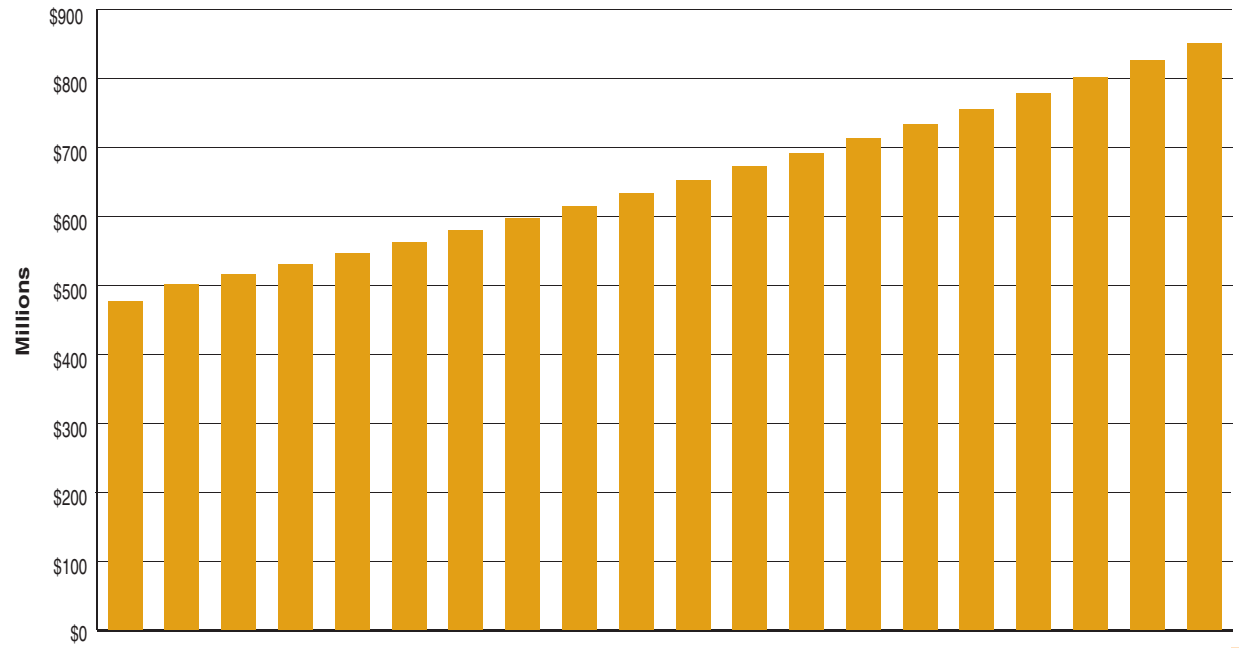
Total Construction Program

In fiscal years 2004 thru 2006, the Department was producing a construction program size of $380 to $390 million, but programs have steadily declined since then. In 2009, Congress passed the American Recovery and Reinvestment Act (Stimulus) that allowed our FY-2010 state highway system program to be increased by $162 million. Unless a second stimulus or jobs bill is passed by Congress, the FY-2011 program will be reduced to approximately $310 million, with most of the program dedicated to preserving and maintaining the existing 10,000-mile State Highway System infrastructure.



State Highway System Inflated Needs

The "2009 State Highway System Needs Assessment" report identifies current needs for the next twenty years at $9.1 billion, in today's dollars. With inflation applied at 5% for FY-2011 and FY-2012, and 3% for the remaining 18 years, over the next 20 years the total cost of the 2009 needs are estimated at $13 billion.



Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Needs Inflated	$477	$501	$516	$531	$547	$563	$580	$597	$615	$633	$652	$672	$692	$713	$734	$756	$779	$802	$826	$851	$13,037
Inflation	5%	5%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	$3%	3%	3%	3%	3%	3%	3%	

Transportation at a Glance

Land Area *(sq. miles)* 76,872

Population *(census estimate 7/1/09)* 1,796,619

Registered Vehicles

Passenger	1,147,354
Mobile Home	39,484
Bus	3,109
Motorcycle	50,322
Trailers	349,299
Dealer	13,358
Government	42,664
Tax Exempt	3,729
Truck	554,898
Snowmobile	750
Total	2,204,967

State Tax Rates *(cents per gallon)*

Effective July 1, 2009

	Motor Fuel Tax	PRRAF*	Total
Gasoline/Gasohol	26.4	.9	27.3
Diesel	26.4	.3	26.7

***PRRAF** = petroleum release remedial action fee

Federal Tax Rate

Gasoline/Gasohol	18.4
Diesel	24.4

Annual Vehicle

Miles of Travel *(millions)* on all Nebraska roadways 18,864

Annual Fuel Use *(gallons)*

Gasoline	268,919,158
Diesel	374,619,550
Gasohol	561,894,697
Total	1,205,433,405

Public Road Miles *(highways, roads, streets)*

Municipal	8,618
County	78,032
State	9,949
Total	96,599

Bridges

State System	3,510
County and Municipal	11,462
Urban	393
Total	15,365

Transit

Providers	70
Counties Served	75

Truck Travel

Vehicle Miles on State Highways *(millions)*	2,013
Commodities Moved *(billion ton-mile)*	26.1

Rail

Miles Operated	3,219
Commodities Moved *(million ton-mile)*	574.9

Data is the most current available for 2009.

NDOR
Nebraska
Department of Roads

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