

# **2014 State Highway Needs Report**

**November 10, 2014**

## **Opening Remarks**

Good afternoon Chairman Dubas, Chairman Mello, and members of the two committees. I am Randy Peters, (R-A-N-D-Y P-E-T-E-R-S), Director-State Engineer of the Nebraska Department of Roads. I am honored to come before you today and I am proud to represent the Nebraska Department of Roads. Today, I will present the State Highway Needs, and answer your questions, with assistance from my expert staff.

Please take a look at page one of the 2014 State Highway Needs Assessment report you have in front of you. As you can see in the table, the total 20-year needs are \$10.2 billion. The pie chart shows that Pavement Restoration comprises 65% of the 20-year Needs; Rural Geometrics and Bridges account for almost 31%. I'll detail those items further in a moment.

I believe it is important to first review how the Department of Roads (NDOR) responded to the State's needs, until fairly recently. Simply stated, NDOR's highway construction program had three priorities, in order: first, state bridges in need of immediate work; second, preservation of the

existing highway system; and third, the addition of capital improvements to the highway system throughout the state.

That approach worked reasonably well while state and federal motor fuel revenues grew naturally and generally kept pace with our program. Then drivers became more concerned about fuel efficiency, and highway user revenues flattened. Nebraska, like most other states, reached the point where system preservation, including bridges, consumed virtually all of our construction funding. Planned major capital improvement projects languished year after year.

Today, system preservation still accounts for the vast majority of NDOR's highway construction budget. The difference is: we no longer have to stop there, thanks to an essential new tool. Starting in July of 2013, the "Build Nebraska Act" began providing a 20-year stream of steady and reliable funding to help address capital improvement needs. I will return to that point later.

### **Overview of Needs**

Let's take a closer look at the Needs of the Nebraska State Highway System. The department breaks those needs into four categories. Those categories are: 1) Pavement Restoration, 2) Rural Geometrics and Bridges, 3) Urban Geometrics and Bridges, and 4) Railroad Crossings.

“Geometrics” improve the configuration of the highway through a variety of features, up to and including adding capacity by means of additional lanes or converting intersections into interchanges.

The Needs Assessment report does not include construction overhead, routine highway maintenance, or administration and support services; nor does it include the department’s buildings and related capital facilities, the state’s carrier enforcement activities, or Nebraska’s transit needs.

After identifying the needs in each of the four categories, they are reviewed and prioritized by NDOR staff, with input from the State Highway Commission and the public, then placed into the Highway Construction Program. That’s how our process works.

I will briefly go over each category. They are listed starting on page three of your Needs Assessment report.

### **Pavement Restoration**

Pavement Restoration needs include the cost of maintaining the State Highway System at a specified pavement condition level (here, “maintaining” includes removing and replacing existing pavements and shoulders as they wear out). The Highway System is evaluated each year using factors such as extent and severity of pavement deterioration, and

ride quality. The data gathered from the pavement evaluations is used to calculate pavement condition indices. These indices, along with the predicted annual rate of pavement deterioration and a benefit/cost analysis are used to compile the pavement restoration needs.

### **Rural Geometrics and Bridges**

The geometric needs are identified using the criteria shown on page four of the Needs Assessment report. These criteria include such items as pavement width, shoulder width, and number of lanes. These criteria are based on estimated future highway traffic volumes, and are divided into six traffic categories ranging from a low of less than 750 vehicles per day to a high of 36,000 vehicles per day and greater.

Once a segment of roadway is found not meeting these criteria, it is identified as deficient, and a cost is assigned to the segment for correcting its deficiencies. The costs of major highway improvements such as new lanes of traffic outside of urban areas are included in this category. Bridge needs are also included in the rural geometrics category. The 2014 “20-Year Needs” includes the widening of Interstate 80 to six lanes, from west of Lincoln to York, eventually reaching Grand Island.

## **Urban Geometrics and Bridges**

Urban needs include the widening or reconstruction of state highways that extend through the corporate limits of cities with a population of 5,000 or greater.

## **Railroad Crossings**

Railroad crossing needs include the cost of building new viaducts, resulting in closing “at-grade” crossings. These needs also include the costs of upgrading or placing new railroad crossing signals on the State Highway System.

## **Conclusion**

In closing, I would like to share two observations with regard to funding streams that affect Nebraska’s highway construction program. First, approximately 50% of Nebraska’s current construction funds are derived from federal sources. MAP-21, the federal transportation bill enacted in 2012 and originally set to expire this past September 30<sup>th</sup>, has been extended only through May 30, 2015. Nebraska’s chance of success in addressing our 20-year needs is critically dependent on Congress’

success in authoring a new, stable and adequately funded federal transportation bill.

Second, I want to return to the Build Nebraska Act. Since the enactment of that vital initiative, the department has been diligently preparing and delivering the first 10 years of projects for this 20-year program. I am happy today to report to you that most of our Tier 1 Build Nebraska Act projects are under construction. Tier 1 is comprised of our fiscal years 14 and 15 BNA projects, and includes:

- Hwy. 133, Blair to Omaha
- Hwy. 10, Kearney East Bypass
- Hwy. 77, Wahoo Bypass
- I-80, Omaha, 126<sup>th</sup> to 96<sup>th</sup> St.
- I-80, Omaha, 60<sup>th</sup> to 24<sup>th</sup> St.
- I-680, Omaha, Center to Pacific St.

Meanwhile, we are making great progress on Tier 2, scheduled for fiscal years 16 through 19. We were able to advance one of those projects, the widening of I-80 on the west side of Lincoln to Northwest 56<sup>th</sup> Street, and it too is now under construction. We are also working on our Tier 3 BNA package for fiscal years 20 through 23.

I will now take any questions you may have.

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Randall D. Peters  
Director – State Engineer  
State of Nebraska  
Department of Roads

“2014 State Highway Needs Assessment”

# 2014 State Highway Needs Assessment



*Hwy 83 south of Thedford.*

**NDOR**

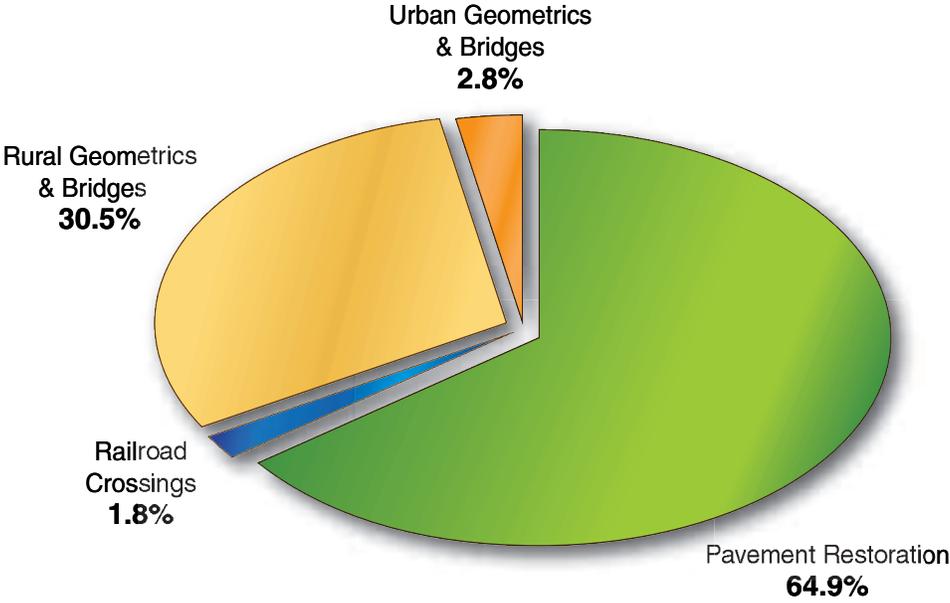
Nebraska  
Department of Roads

Dave Heineman  
Governor

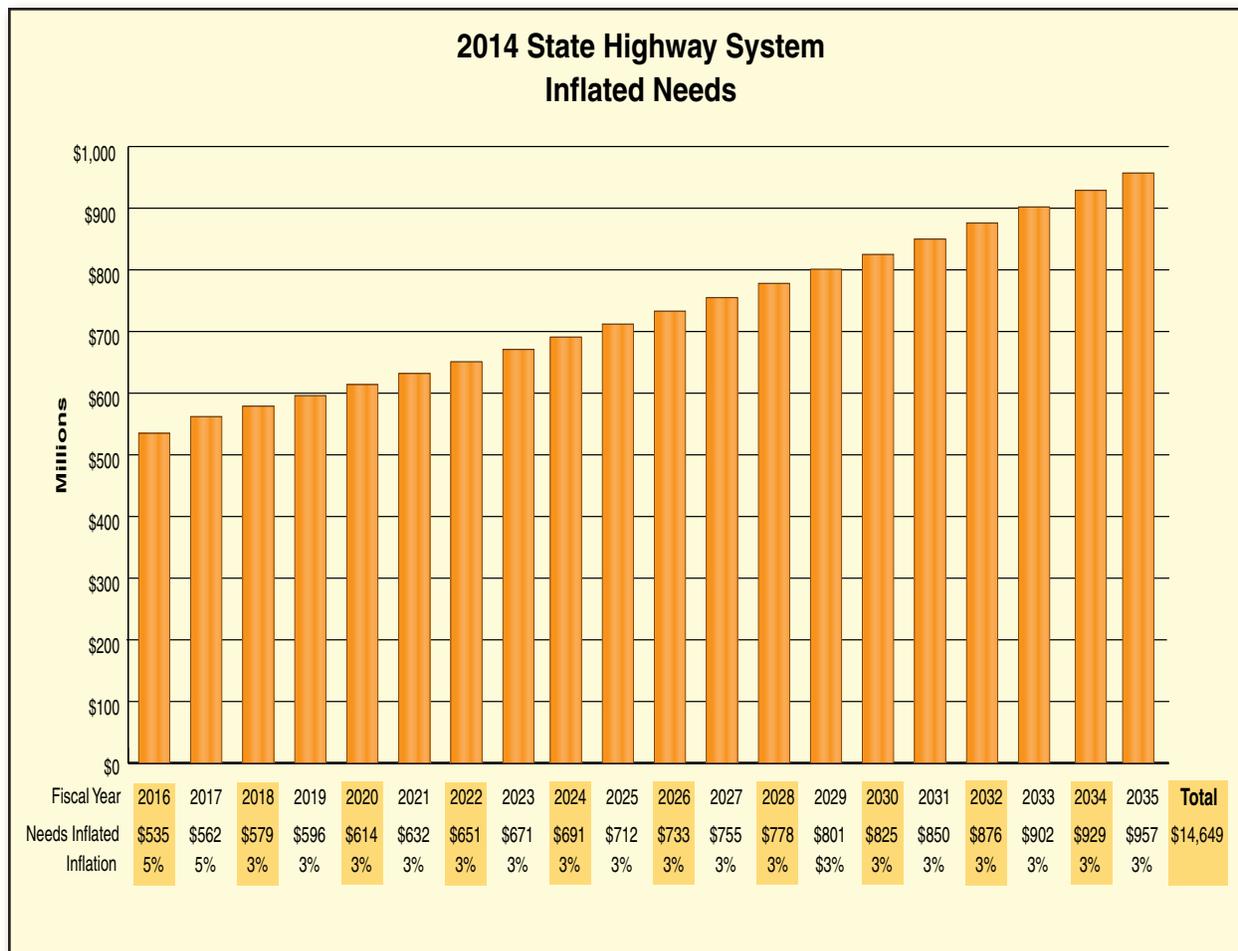
Randall D. Peters, P.E.  
Director – State Engineer

# Summary of 20-Year Needs

	2013	2014
Pavement Restoration	\$6,096,446,000	\$6,619,743,000
Rural Geometrics & Bridges	3,219,662,000	3,110,616,000
Urban Geometrics & Bridges	337,223,000	285,628,000
Railroad Crossings	164,600,000	179,600,000
<b>Total</b>	<b>\$9,817,931,000</b>	<b>\$10,195,587,000</b>



# Executive Summary



The “2014 State Highway System Needs Assessment” report identifies current needs for the next 20 years at \$10.2 billion, in today’s dollars. With inflation applied at 5 percent for FY-2016 and FY-2017, and 3 percent for the remaining 18 years, over the next 20 years the total cost of the 2014 needs are estimated at \$14.6 billion.

# Introduction

In 1988, by virtue of State Statute 39-1365.02, the Nebraska State Legislature assigned the Nebraska Department of Roads the task of annually reporting on the needs of the State Highway System. Since that time, Nebraska has made steady progress identifying and addressing the dynamic needs of the State Highway System.

The needs of the State Highway System are divided into four categories.

- Pavement Restoration
- Rural Geometrics & Bridges
- Urban Geometrics & Bridges
- Railroad Crossings

Following is a brief description on how the needs assessment is compiled.

## Pavement Restoration

The entire State Highway System is rated each year 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 evaluation. With the information supplied by these annual ratings, formulas have been developed to calculate the overall condition of the roadway. These condition ratings are then used in a pavement optimization process to identify the 20-year pavement restoration needs. This pavement optimization process includes a benefit/cost analysis, annual pavement deterioration rates, and the capability to calculate the cost to maintain the State Highway System at a specified pavement condition level.

The cost to replace Interstate pavements as they reach the end of their service life is included in this category.

Pavement restoration needs are not constant from one year to the next. There are many different factors that affect the number of miles needing to be addressed, some of which are: previous year's resurfacing, extreme environmental conditions, traffic volumes and loads, and yearly maintenance.

## Rural Geometrics and Bridges

The non-interstate rural geometrics needs are defined using the criteria shown on page 5. These needs criteria are developed around the current design standards. Geometric needs include deficiencies such as pavement width, shoulder width, number of lanes, and vertical curves. All contract and as-built plans are reviewed to ensure that the Department's database contains the most current geometric information. The geometric needs are compiled by calculating the construction costs, including resurfacing costs, required to correct the geometric deficiency. These costs are updated annually. The bridge needs of the state are also part of the geometric needs. The Bridge Division has developed and maintains a Bridge Management System, which is used to identify the bridge needs. Each bridge is inspected every two years.

The costs associated with the geometric needs on the Interstate include all the six-lane work from Omaha to Grand Island, interchanges, and bridge needs. The six-lane needs are determined by projecting when the traffic density will reach level-of-service (LOS) D, as defined in the current version of the Highway Capacity Manual.

## Urban Geometrics and Bridges

Urban needs are associated with widening or reconstruction of state highways and bridges through cities with a population greater than 5,000. The urban bridge needs are extracted from the Bridge Management System and are included in this category.

## Railroad Crossings

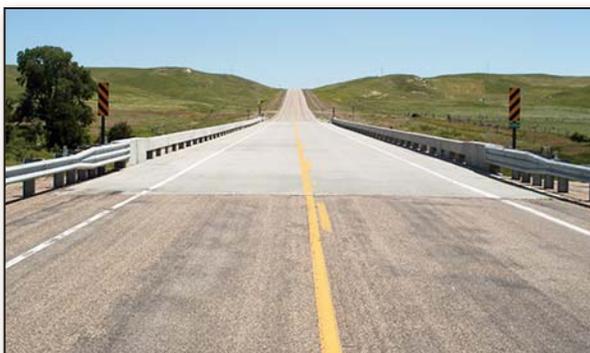
The railroad crossing needs are annually reviewed and updated. The grade separation and rail crossing/hazard elimination needs for the State Highway System are included in this category.

# Needs Assessment Criteria

The needs assessment criteria to identify noninterstate roadway geometric deficiencies are grouped into six Average Daily Traffic (ADT) categories as listed:

## Bridges

Bridge needs are identified using the current and projected bridge rating data available in the Nebraska Bridge Inventory System. Width, scour, substructure, and superstructure ratings are examples of the data used to identify bridge deficiencies. Such bridges are identified using the Bridge Management System.



## Future ADT

**36,000 & greater**  
*(six lanes warranted)*

**10,000 - 35,999**  
*(four lanes warranted)*

- 12' surfaced lane width
- Outside shoulder  
8' of the 10' shoulder will be paved
- Inside shoulder  
3' of the 5' shoulder will be paved

**4,000 - 9,999**

- 12' surfaced lane width
- 8' shoulder width w/2' paved shoulder
- Stopping sight distance  
No vertical crest curve equal to or less than 50 mph

**2,000 - 3,999**

- 12' surfaced lane width
- 6' shoulder width w/2' paved shoulder
- Stopping sight distance  
No vertical crest curve equal to or less than 50 mph

**750 - 1,999**

- 12' surfaced lane width
- 3' shoulder width  
When segment is in the Sandhills,  
4' shoulder width w/2' paved shoulder
- Stopping sight distance  
No vertical crest curve equal to or less than 40 mph

**Under 750**

- 11' surfaced lane width
- 2' shoulder width  
When segment is in the Sandhills,  
a 4' shoulder width w/2' paved  
shoulder will be used.
- Stopping sight distance  
No vertical crest curve equal to or less than 40 mph

# Summary of Highway Needs by Category

The following is a summary of the estimated costs (in 2014 dollars), identified for each category of needs.

## Pavement Restoration

The projected 20-year pavement restoration needs for this assessment are listed at \$6,619,743,000. These needs will never be completely eliminated simply because of the annual deterioration of our pavements. The Department continues to explore new technology and materials, which may lead to improved pavement performance and extend pavement life.



## Rural Geometrics and Bridges

The projected 20-year geometric needs for rural highways are \$3,110,616,000.

The geometric needs for rural and municipal highways include \$348,403,000 for bridge needs. Bridge needs include the cost to rehabilitate or replace bridges, approach slabs, guardrail and culvert needs.



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## Urban Geometrics and Bridges

The 2014 urban (population > 5,000) needs total is \$285,628,000. These urban needs include \$49,888,000 for deficient bridges.



## Railroad Crossings

The needs in this category are comprised of grade separation needs and rail crossing/hazard elimination needs, which total \$179,600,000. This 20-year total includes \$176,000,000 for 22 grade separations and \$3,600,000 for signals.

The 2014 Needs Assessment includes all passive warning device locations with an exposure factor of 3,000 or greater. There are nine locations on the State Highway System with an estimated cost of \$400,000/location, for a total of \$3,600,000.



# NDOR's Mission Statement

*We provide the best possible statewide transportation system for the movement of people and goods.*

## NDOR Goals



**Safety**



**Fiscal Responsibility**



**Environmental Stewardship**



**Project Delivery**



**Asset Management**



**Mobility**



**Communication, Coordination,  
Collaboration & Cooperation**



**Workforce Development**