

# Appendix II

## Nebraska Long-Range Transportation Plan

*System Needs, Costs and Revenues*  
*March 2012*

Nebraska Department of Roads

---

# Table of Contents

<b>Transportation System Needs, Costs and Revenues .....</b>	<b>4</b>
Introduction .....	4
1.0 Highway and Roadway Needs and Costs.....	4
1.1 Nebraska Highway System .....	4
1.2 State Highway System Needs .....	5
1.3 State Highway System Revenues .....	7
1.4 Highway Needs Off the State Highway System .....	9
2.0 Public Transportation Costs .....	10
2.1 Metropolitan Area Transit Providers.....	11
2.2 Rural Transit Systems.....	14
2.3 Intercity Transit.....	15
3.0 Freight Rail.....	16
3.1 Freight Rail Costs by Category .....	16
3.2 Summary of Rail Costs.....	18
4.0 Bicycle and Pedestrian Costs .....	18
5.0 Airport Funding Needs.....	24
6.0 Summary of Transportation Needs and Costs.....	27

# List of Tables

1.1 Centerline Mileage of Nebraska Highways by Road Type and Ownership .	5
1.2 Criteria for State Highway Sections .....	6
1.3 State Highway System Needs by Category.....	7
1.4 State Highway Trust Fund Revenue Sources.....	8
2.1 Summary of Metropolitan/Rural Transit Costs .....	14
3.1 Summary of Annual Freight Rail Capital Costs for Nebraska .....	18
4.1 Primary Regional Trail Corridors Costs .....	22
4.2 Community Trails Costs .....	23
4.3 Regional and Community Trail Costs.....	24
5.1 Nebraska Airport Classifications.....	25
5.2 Airport Funding Needs.....	26
6.1 Summary of Total Nebraska Capital Needs and Costs for All Transportation Modes .....	27

# List of Figures

1.1 State Highway System 20-Year Needs..... 9

4.1 Trans-State Trails Map ..... 19

4.2 Primary Regional Trail Corridors Map..... 20

# Transportation System Needs, Costs, and Revenues

## ■ Introduction

Historically, Nebraska has provided access to all communities in the State to provide mobility for all residents, to facilitate economic growth, and to ensure that goods flow to their destinations. An assessment of investment needs and costs is an important part of assuring that Nebraska continues to meet the Nebraska Long-Range Transportation Plan goals for mobility, safety, environmental stewardship and coordination and cooperation. Needs or costs are defined for each mode of transportation: state highways, local roadways, urban and rural transit, aviation, freight rail, bicycle, and pedestrian travel.

In order to address these needs or costs, agencies must evaluate what resources they have available. Revenues are the resources that are likely to be available to address these transportation system needs or costs. Sources of transportation revenue include state and Federal fees on motor fuels and vehicles, general fund appropriations, local property taxes, and special assessments. The difference between transportation system needs or costs and the likely revenues is the shortfall or gap.

## ■ 1.0 Highway and Roadway Needs and Costs

### 1.1 Nebraska Highway System

The Nebraska highway and roadway network serves as the primary mode of transportation for both personal and freight travel within the State. Nebraska has 93,654 miles of roads, of which 9,944 miles (10.6 percent) are state-owned roads. In 2008, there were 18.864 billion annual vehicle miles of travel (AVMT) on Nebraska roadways, with approximately 63 percent on state roads. Nebraska's annual highway VMT per capita is 10,497, almost 10 percent above the national average of 9,500. Additionally, an estimated 26.1 billion ton-mile of freight moved on Nebraska's highways in 2008. Table 1.1 shows the road inventory by functional class, mileage, and ownership.

The urban and rural interstate system in Nebraska comprises about one-half of one percent of the total state roadway system mileage but carries 21 percent of all vehicle traffic. By contrast, Nebraska's rural local roads comprise about 64 percent of miles but carry only six percent of vehicle traffic. Because these lower volume roadways are important for a functioning transportation system, they cannot be neglected.

**Table 1.1 Centerline Mileage of Nebraska Highways by Road Type and Ownership**  
*By National Functional Classification*

Road Type	State-Owned Mileage	Non-State Mileage	Total Mileage
<b>Urban</b>			
Interstate	64	-	64
Principal Arterials	325	173	498
Minor Arterials	117	760	777
Collectors	-	483	483
Local Roads	-	4,611	4,611
<i>Subtotal Urban</i>	<u>406</u>	<u>6,027</u>	<u>6,433</u>
<b>Rural</b>			
Interstate	418	-	418
Principal Arterials	2,694	-	2,694
Minor Arterials	4,168	1	4,169
Collectors	2,254	18,033	20,287
Local Roads	4	59,649	59,683
<i>Subtotal Rural</i>	<u>9,538</u>	<u>77,683</u>	<u>87,221</u>
<b>Grand Total</b>	<b>9,944</b>	<b>83,710</b>	<b>93,654</b>

Source: NDOR Materials & Research Division - December 12, 2010.

## 1.2 State Highway System Needs

Assessing highway needs and costs is a critical element of the Nebraska Department of Roads' (NDOR) transportation planning and programming process. The 2011 *State Highway Needs Assessment* identifies specific improvements that should be made to the existing highway system. The State has defined specific criteria for highways that are based in large part on traffic volumes. Criteria for the state highway system are shown in Table 1.2. In addition, the State has identified several key components of the system, including the Interstate System, the Expressway System, and the Priority Commercial System. Specific criteria also apply to these systems, and there are special criteria for other portions of the system (e.g., roads in the Sand Hills).

**Table 1.2 Criteria for State Highway Sections**

---

<b>Future Annual Daily Traffic (ADT)</b>	
36,000 & Greater	<ul style="list-style-type: none"> <li>• Six lanes warranted</li> </ul>
10,000 – 35,999	<ul style="list-style-type: none"> <li>• Four lanes warranted</li> <li>• 12' surfaced-lane width</li> <li>• Outside shoulder – 8' of the 10' shoulder will be paved</li> <li>• Inside shoulder – 3' of the 5' shoulder will be paved</li> </ul>
4,000 – 9,999	<ul style="list-style-type: none"> <li>• 12' surface lane width</li> <li>• 8' shoulder width w/6' paved shoulder</li> <li>• Stopping sight distance – No crest vertical curved below 50 mph</li> </ul>
2,000 – 3,999	<ul style="list-style-type: none"> <li>• 12' surface lane width</li> <li>• 6' shoulder width w/2' paved shoulder</li> <li>• Stopping sight distance – No crest vertical curved below 50 mph</li> </ul>
750 – 1,999	<ul style="list-style-type: none"> <li>• 12' surfaced-lane width</li> <li>• 3' shoulder width</li> <li>• When segment is in the Sandhills, 4' shoulder width w/2' paved shoulder</li> <li>• Stopping sight distance – No crest vertical curved below 40 mph</li> </ul>
Less than 750	<ul style="list-style-type: none"> <li>• 11' surfaced-lane width</li> <li>• 2' shoulder width</li> <li>• When segment is in the Sandhills, 4' shoulder width w/2' paved shoulder</li> <li>• Stopping sight distance – No crest vertical curved below 40 mph</li> </ul>

---

Source: NDOR 2011 State Highway Needs Assessment

Note: The NDOR District Engineers review and update the urban and municipal needs annually. These needs are associated with minor widening, major widening, or reconstruction of state highways through urban and municipal areas.

The 2011 *State Highway Needs Assessment* report identifies capital needs for state highways that are owned by NDOR over the next 20 years or through 2032. The needs for 20 years are estimated at \$9.6 billion in year 2012 dollars or \$13.8 billion in year of expenditure dollars. The NDOR *State Highway Needs Assessment* provides estimates of 20-year needs in several different categories for the state highway system, as shown in Table 1.3.

**Table 1.3 State Highway System Needs By Category**  
*In Millions of Dollars for 2013 Through 2032*

<b>Functional Classification or Category</b>	<b>Total Capital Needs (2013-2032) (2011 dollars)</b>	<b>Total Capital Needs (2013-2032) (Year of Expenditure Dollars)</b>
Pavement Restoration	\$6,194	\$8,902
Rural Geometrics	\$2,670	\$3,837
Urban (population > 5,000)	\$369	\$530
Railroad Crossings	\$174	\$250
Missouri River Bridges	\$0	\$0
Miscellaneous (guardrail updating, traffic signals, rest areas, etc.)	\$209	\$301
<b>Total</b>	<b>\$9,616</b>	<b>\$13,809</b>

Source: Total capital needs for 2013 through 2032 are from the NDOR 2011 State Highway Needs Assessment. Year of expenditure dollars are calculated using inflation applied at 5% for FY-2013 and FY-2014, and 3% for the remaining 18 years. Totals may not add due to rounding. The 2011 State Highway Needs Assessment was the latest assessment at the time of press. The current assessment can be accessed at <http://www.dor.state.ne.us/needs/index.htm>.

State transportation plans and metropolitan transportation plans cover at least a 20-year forecast period in accordance with Federal guidance. State and metropolitan plans are usually updated every five years.

### 1.3 State Highway System Revenues

Revenues are required to address the needs identified for the State Highway System. These revenues flow to the Nebraska Department of Roads<sup>1</sup> from the State Highway Trust Fund, which in turn has several dedicated funding sources. These revenue streams along with their relative contribution to the State Highway Trust Fund are shown in Table 1.4.

<sup>1</sup> Note: The Nebraska Department of Roads shares revenue from the State Highway Trust Fund with the Highway Allocation Fund, a mechanism for funding county and city highway investments.



**Table 1.4 State Highway Trust Fund Revenue Sources**

Source	Proportion of Trust Fund Revenue
Motor Fuel Taxes	58.8%
Motor Vehicle Sales Taxes	28.4%
Motor Vehicle Registration Fees	8.7%
International Registration Plan Registration Fees	3.9%
Investment Earnings	0.2%
<b>Total</b>	<b>100.0%</b>

Source: Based on 2009 data from the Distribution of State Highway Trust Fund chart located on the NDOR web site.

The 2011 *State Highway Needs Assessment* report identifies capital needs for state highways that are owned by NDOR over the next 20 years or through 2032. The needs for 20 years are estimated at \$9.6 billion in year 2012 dollars or \$13.8 billion in year of expenditure dollars. While NDOR's 2011 *State Highway Needs Assessment*<sup>2</sup> projects that total needs will grow at a projected inflation rate of 5% for FY-2013 and FY-2014, and 3% for the remaining 18 years, total revenue is projected to remain relatively flat.<sup>3</sup> Figure 1.1 shows total needs for the State in year of expenditure dollars.

As shown in figure 1.1, State highway system needs are estimated to be \$505 million in FY-2013. Based on NDOR's current estimate, the amount of revenue that would be available for the FY-2013 construction program is \$389 million. This results in a shortfall of \$116 million. If revenue were to remain constant over the next twenty years this funding shortfall would continue to swell through 2032.

<sup>2</sup> The 2011 State Highway Needs Assessment was the latest assessment at the time of press. The current assessment can be accessed at <http://www.dor.state.ne.us/needs/index.htm>.

<sup>3</sup> NDOR - July 2011 email.

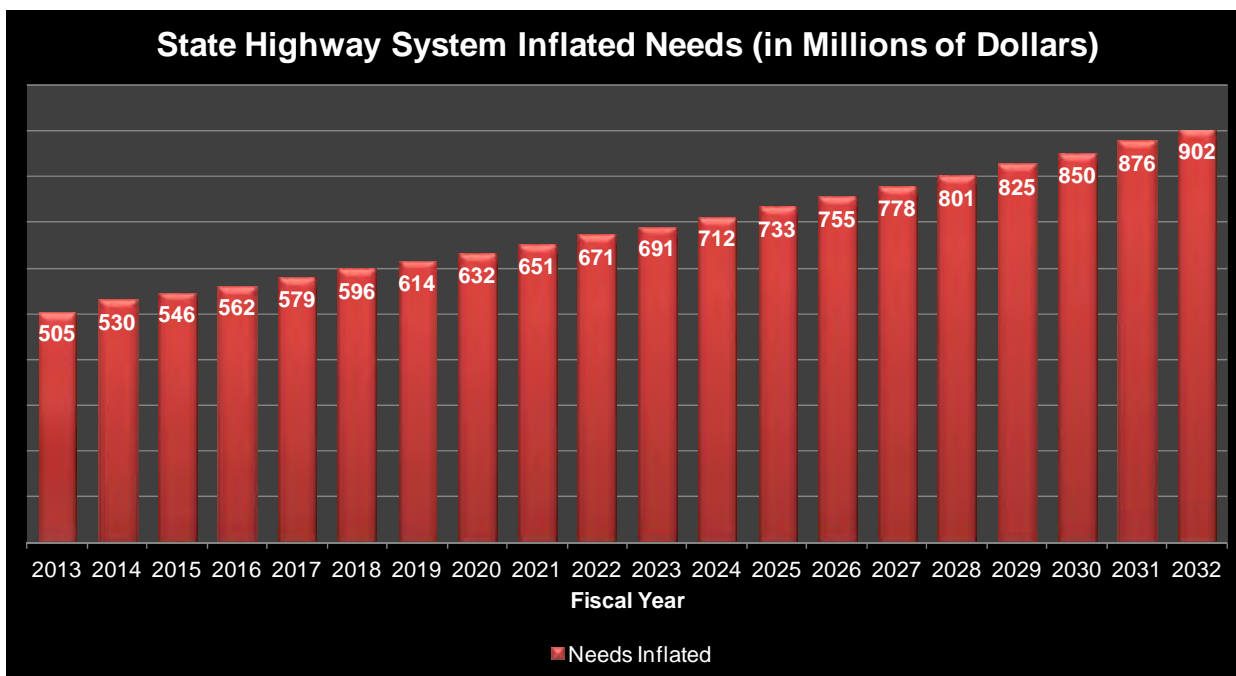


Figure 1.1 State Highway System 20-Year Needs

### 1.4 Highway Needs Off the State Highway System

An essential component of NDOR’s Long Range Transportation Plan Update is the ability to estimate the current and future transportation needs across the state. NDOR has a well-established process for defining Nebraska’s 20-year *state* highway needs, with consistent data and an annual State Highway Needs Assessment. However, there is no consistent data or criteria for projecting non-state highway needs in metropolitan areas, cities, counties, or rural areas across the state. Responses from a survey of highway and street superintendents enable NDOR to assess the gap between local needs and available revenues.

Surveys were mailed in July, 2010 to 420 appointed Highway/Street Superintendents, with 143 responding to the survey. Nebraska cities and counties indicated that if their current level of funding remains the same, over the next 20 years, 37% of *capital improvement* needs 54% of *maintenance* needs will be addressed. Again, it is important to stress that the off-system needs analysis estimate is based on the results of a survey rather than the established technical process of extensive data collection used to report the state highway needs assessment.

The survey to highway and street superintendents also asked the respondents to determine the top three areas they expect to experience considerable funding shortfall over the next twenty years. The results indicate the top significant funding shortfalls to be:

- ✓ Maintenance of Hard Surfaced Roads (74%)
- ✓ Upgrades to Existing Roadways (70%)
- ✓ Construction of New Roads (39%)
- ✓ Equipment (34%)
- ✓ Bridge Replacement (33%)

## ■ 2.0 Public Transportation Costs

The Nebraska LRTP identifies public transportation as an important part of the statewide transportation system. Public transportation contributes to the mobility of all Nebraskans, including those who lack the financial resources or physical ability to access other modes of travel. Public transportation provides linkages to jobs, schools, community services, and commercial services; increases the capacity of transportation corridors; and helps to reduce auto VMT.

There are three categories of public transportation for which costs are identified:

1. Metropolitan area transit providers;
2. Rural transit providers; and
3. Intercity transit providers.

For each category, the costs for services and facilities are identified, and an estimate is provided of capital, operating, and maintenance costs over the next 20 years.

## 2.1 Metropolitan Area Transit Providers

The three metropolitan area transit providers are the Omaha Metro Transit System the Lincoln StarTran, and the Sioux City Transit System (SCTS).

### Omaha - Metro (MAT)

As is documented in the Metropolitan Area Planning Agency (MAPA) Long Range Transportation Plan (LRTP), the basic transit concept for the Omaha metropolitan area is a system of combined radial and cross-town routes (local and express) that meet at established transit centers. Metro, formally known as Metro Area Transit "MAT" is supported by taxes collected within the City of Omaha (encompassing 120 square miles). Consequently, Metro principally operates within the Omaha city limits. However, other cities inside the MAPA TMA contract with Metro to provide public transportation, including the Cities of Council Bluffs, IA and Bellevue, La Vista, Papillion and Ralston in Nebraska. Metro's fixed route service operates generally on Monday - Friday from 4:00 a.m. to 11:50 p.m., on Saturday from 5:48 a.m. to 10:18 p.m., and on Sunday from 5:53 a.m. to 6:50 p.m. On school days, Metro increases services to accommodate student passengers. Fixed routes maximize access by providing frequent stops while commuter/express routes increase speed by including non-stop segments. Commuter/express routes operate on arterials and freeways and provide suburban to Central Business District (CBD) service. This basic structure is anticipated to continue to characterize the system through the 20-year planning horizon. Metro's planning staff has identified a number of currently unmet service proposals.

### Year 2010 Services and Expected Growth

Metro has identified the following cost drivers associated with its current services:

- **Bus fleet replacement.** Through the 20-year planning horizon, 76 percent of the bus fleet would need to be replaced at least once. Metro's estimate is the transit bus replacement requirement is approximately nine vehicles per year.
- **Elderly and handicapped vehicle replacement.** The current fleet of 23 vehicles is historically in need of replacement every 5 years, equivalent to approximately 3 vehicles per year.
- **Relocation of the downtown 16<sup>th</sup> Street and Mid-Town Transit Centers** designed for more efficient passenger multi-directional transferring and include sustainable type amenities such as bike storage; Wi-Fi, etc. Capital improvements are desirable to enhance services.
- **System Capital Improvements.** Upgrading fleet amenities to include automated stop announcement equipment, electronic fare collection, e.g., debit cards.
- **Preventative maintenance and Americans with Disabilities Act (ADA) compliance.**

## Enhanced Services

There are also funding costs associated with enhanced services, although the current estimate of such costs is that these enhancements can be accomplished through adjustments in the use of existing financial and operating resources. These enhancements include the following:

- Hours of service and service frequency system adjustments are implemented approximately three times annually; and, are designed to enhance travel for the public.
- Improvements to efficiency through the development of additional park and ride locations, and expanded partnerships with private entities to increase revenue stream. Examples of successes existing partnerships are 1) local community college provides all students at no cost to the student prepaid fare media for unlimited ride bus trips and demand response service; and 2) two major employers contract with Metro for expanded hours and frequency of service on specific routes which are available to the general public in addition to the aforementioned employers employees.
- Expansion of route services in western and northwest Omaha.
- Metro staff is currently analyzing operating costs. The goal of the analysis is to 1) identify changes to the current program that would build in enough efficiency to allow for changes to the route coverage (system expansion) and 2) actively identify and pursue additional funding sources. This would allow, at a minimum, additional services to be provided within the current labor budget and with essentially the same number of buses.

## Lincoln - StarTran

The StarTran transit system in Lincoln is a city-operated system providing fixed-route scheduled service and demand-responsive services within the City. StarTran carried almost 1.8 million unlinked trips in 2010 with a fleet of 61 fixed route vehicles on 18 routes and 11 vehicles for demand response service. Ninety-seven percent of those boardings were on the fixed route service.

In 2008 StarTran initiated a revised fixed route structure based on the recommendations resultant from the Transit Development Plan. This plan included a number future year recommendations for enhancing transit services in Lincoln:

- Evening Service
- Service Expansion
- Express Services and park and ride
- Downtown Streetcar Service
- Second Transit Hub Development

Based on ridership forecasts from the Transit Development Plan StarTran ridership is expected to grow at approximately one percent per year. This would result in more than 2.2 million annual transit boardings by the end of the 20-year period. Most of this ridership growth would result from the extension of the current service area.

The annual operating and maintenance budget for StarTran is estimated at \$9.68 million in 2010. The annual operating cost is expected to increase to \$17.8 million per year (year of expenditure dollars) over the next twenty years to accommodate the system extension into newly incorporated areas of the City of Lincoln. This results in a total 20-year operating and maintenance cost of \$282 million (year of expenditure dollars).

Total 20-year capital costs are estimated to be \$53.7 million (year of expenditure dollars), or an average annual figure of \$2.0 million (current dollars). Future capital costs include bus fleet replacements and on-going replacement of equipment. The existing fleet of 72 vehicles (conventional buses and paratransit vehicles) would need to increase to approximately 90 vehicles over the next twenty years under the assumed growth scenario. Consequently, the existing storage and maintenance facility will probably need to be expanded to accommodate the increased fleet size.

### ***Sioux City - Sioux City Transit System (SCTS)***

South Sioux City, Nebraska, is part of the Sioux City, Iowa, tri-state metropolitan area that also includes North Sioux City, South Dakota. It is served by SCTS; operated by Sioux City, Iowa; and provides conventional scheduled fixed-route service and demand-responsive service. One of the 21 SCTS fixed routes is in Nebraska. The 2000 metropolitan population was 110,000 of which the Nebraska portion was 12,000, or approximately 11 percent.

In 2010, SCTS carried more than 1.2 million boardings with 96 percent of those occurring on the scheduled fixed-route services. During FY 2010, the #9 South Sioux City, Nebraska Route carried a total of 46,536 passengers or 7.7% of the total fixed route ridership. The metropolitan population is expected to increase at 1 percent per year overall, but the Nebraska portion is expected to grow faster so that the Nebraska population will increase to nearly 15 percent of the total metropolitan area. Transit ridership over the next twenty years is projected to grow to 69,830 for the Nebraska portion of SCTS (ridership = 46,536 actual 2010 X 1.5 over 20 years.). Transit ridership growth is expected mainly from extending service into newly developed areas.

Annual operating and maintenance costs for the Nebraska portion of SCTS are currently \$209,602. The 20-year operating and maintenance costs are estimated to be \$5.8 million using a 3% rate of inflation.

Future capital costs for the Nebraska portion of the service would primarily be for transit vehicles - rehabilitation and replacement of existing vehicles and acquisition of additional vehicles to serve extensions into newly developed areas. The total 20-year capital cost for Nebraska services is estimated at \$1 million (two replacement vehicles assumed to be Hybrid Diesel/Electric).

## 2.2 Rural Transit Systems

There are currently 61 rural transit systems which provide service to 75 of Nebraska's 93 counties. The total annual ridership in 2009 was approximately 750,000, with nearly 70 percent of those riders being senior citizens. Total vehicle miles of service in 2009 were approximately 2.2 million and have been growing at a faster rate than ridership. The total vehicle fleet for these rural transit systems is approximately 160 vehicles. Total annual operating and maintenance (O/M) costs for all these systems combined were approximately \$5.6 million in 2009. Nearly all of the systems are demand responsive and operate on the basis of users making advance reservations. Services are typically provided Monday through Friday between 8:00 a.m. and 5:00 p.m., with about a dozen systems having some weekend service.

The NDOR's Nebraska Rural Transit Study (December 2005) provides a framework for future rural service in Nebraska. The future service framework includes five elements:

1. Ensure Essential Mobility Services for Rural Residents;
2. Encourage Coordination of Services and Programs;
3. Increase Ridership through Marketing Tools and Techniques;
4. Improve rural Transit Infrastructure; and
5. Improve Overall System Performance and Operations.

### *Summary of Transit Systems Costs*

Table 2.1 summarizes the key characteristics and costs of the metropolitan area and rural transit systems (only the Nebraska portion is shown for Omaha and Sioux City).

**Table 2.1 Summary of Metropolitan/Rural Transit Costs**

*In Millions of Year of Expenditure Dollars*

<b>Metropolitan Area and Transit Operator</b>	<b>Ridership Forecast (20-year)</b>	<b>Total \$O/M Costs (20 year)</b>	<b>Total Capital Costs (20-year)</b>
Omaha - Metro*	6.4 M	\$695	\$125
Lincoln - StarTran	2.2 M	\$282	\$53.7
Sioux City - SCTS*	69,800	\$5.8	\$1.0
Rural	1.0 M	\$190	\$46
<b>Total</b>	<b>8.7 million</b>	<b>\$982.8 million</b>	<b>\$179.7 million</b>

## 2.3 Intercity Transit

Amtrak provides intercity passenger rail service across the State, connecting Omaha with Chicago and Denver on the *California Zephyr*, with one trip per day in each direction. Seven other private bus providers service selected intercity connections.

Two studies have explored the need for additional intercity transit services. The rural transit study for NDOR includes investigating the intercity services for consideration in its long-term recommendations, especially among smaller communities. A second study covering intercity transit is the *Nebraska Transit Corridors Study*, completed in December 2003, for the Nebraska Transit and Rail Advisory Council (NTRAC) in participation by NDOR. This study initially investigated a multitude of intercity corridors in the State before finally settling on three for further study. These three intercity corridors are Lincoln to Omaha, Fremont to Omaha, and Blair to Omaha; all connect to Omaha.

Each of these three corridors is a shortened segment of longer corridors initially under consideration. The Lincoln to Omaha corridor is currently served by Amtrak, Greyhound, and other bus services. Fremont to Omaha is currently served by Black Hills Stage Lines. Blair to Omaha does not currently have intercity public transportation.

The results of this study suggest that the greatest potential for cost-effective improved transit service is bus service for all three corridors. The estimated ridership for the preferred scenario is shown below first year of service and year 20, along with other basic characteristics of the service. (The costs estimated in this conceptual study are not included in overall transportation system costs.)

- **Annual ridership.** 140,000 currently and 190,000 in year 20;
- **Fleet size.** Eleven motor coaches over the next 20 years;
- **Annual O/M costs** - \$690,000 (current dollars); and
- **Initial capital costs (vehicles and other facilities)** - \$5.3 million (current dollars).



## ■ 3.0 Freight Rail

No public source of information is available from which to estimate long-term Nebraska systemwide rail costs. Although railroads are privately owned and operated, their conditions and performance will have an impact on the demand for highway freight movements and on highway needs. An approximation of freight rail costs has been developed based on available national reports on freight rail costs, and on NDOR estimates of rail-grade crossing and signal safety needs. For the Nebraska LRTP analyses, freight rail costs are shown in the categories of: 1) shortline railroad costs, 2) Class I railroad infrastructure costs, 3) Class I non-infrastructure costs, and rail crossing and other rail signal safety needs are listed.

The first three categories are estimated based on a percentage of national estimates. Nebraska includes roughly 2.44 percent of the nation's railroad infrastructure, based on the rail mileage within Nebraska as a percentage of national rail mileage. This figure was used to estimate Nebraska's portion of the cost estimates for the nation. Because the Nebraska rail lines are more heavily used than the average national rail lines, the 2.44 percent figure is likely conservative.

### 3.1 Freight Rail Costs by Category

#### *Shortline Costs*

The tracks and bridges of much of the nation's shortline system are inadequate to handle the newer 286,000-pound and 315,000-pound railcars coming into service. The American Short Line and Regional Railroad Association (ASLRRA) commissioned a study to estimate the cost of upgrading the nation's shortline system to handle 286,000-pound railcars. The cost was estimated at \$6.9 billion nationally. A second source is an estimate included in the findings of the Railroad Shipper Transportation Advisory Council (White Paper III, April 2000), which was based on a 1999 survey by the American Association of State Highway and Transportation Officials (AASHTO). The Council found a total capital cost of \$11.8 billion nationally, of which \$9.5 billion were unfunded at that time. The Council's estimate included redress of deferred maintenance and safety, speed, and weight improvements. The estimates from ASLRRA and AASHTO are used as the upper and lower bounds for national shortline infrastructure costs in this study.

The shortline infrastructure costs for Nebraska are likely to be about 2.44 percent of the nation's shortline costs. An estimate of between \$168 million to \$288 million is needed to make the improvements to the shortline rail infrastructure necessary to carry 286,000-pound rail cars. These figures equate to between \$8.0 million and \$14 million (\$11 million average) per year over a 20-year period. Improving the system to enable it to carry 315,000-pound rail cars would involve additional costs.

### ***Class I Infrastructure Costs – Repair and Maintenance***

The vast amount of Class I infrastructure in Nebraska necessitates a continual investment by Class I railroads to maintain and upgrade their lines. Insufficient track capacity is an issue on high-volume corridors and at rail yards. There are also portions of the Class I rail lines costs of upgrading to enable them to carry heavier rail cars.

The Association of American Railroads (AAR) estimates that the cost to perform Class I infrastructure repair and maintenance is \$4.0 billion to \$5.0 billion annually (or \$80 billion to \$100 billion over the next 20 years). With 2.44 percent of the nation’s rail infrastructure, the share of these costs likely to be incurred in Nebraska is \$1.95 billion to \$2.44 billion, or between \$98 million and \$122 million per year (\$110 million average) per year over a 20-year period.

### ***Class I Infrastructure Costs – Beyond Repair and Maintenance***

There are several non-infrastructure-related needs throughout the national rail system. Technology has played a major role in the increased productivity of the rail industry, allowing railroads to carry higher volumes at lower real costs. Rail industry efficiency can be further enhanced with the expanded use of technologies (i.e., electronic braking, positive train control, remote control of trains, and information technology used for yield management, asset optimization, and dispatching).

AAR estimates that the national cost for non-infrastructure Class I improvements is roughly \$2.0 billion annually or \$40 billion over the next 20 years. With 2.44 percent of the nation’s rail infrastructure, the share of these costs likely to be incurred in Nebraska is \$49 million per year, or about \$1.0 billion over 20 years.

### ***Rail Crossing and Other Rail Signal Safety Needs***

The Institute of Transportation Research and Education (ITRE) at North Carolina State University surveyed state rail-safety costs, focusing on highway-rail at-grade crossings. The total national costs estimated by this study were for \$13.8 billion for rail safety over the next 20 years. Nebraska’s proportion, based on its 2.44 percent of the nation’s infrastructure, would equate to a safety estimate of \$336 million over 20 years, or about \$17 million per year. NDOR’s estimate of rail safety needs on the State Highway System over the next 20 years is \$235 million. Similar needs for the non-state highway system are estimated at \$205 million for a total of \$440 million, or about \$22 million per year. NDOR’s Nebraska-specific figure is used in the summary estimates in Table 3.1.

**Table 3.1. Summary of Annual Freight Rail Capital Costs for Nebraska**

Costs Category	Estimated 20-year Costs (\$ Millions)	Estimated Costs in Year of Expenditure Dollars (20-year) (\$ Millions)
Shortline	\$11	\$305
Class I - Infrastructure	\$110	\$3,044
Class I - Non-Infrastructure	\$49	\$1,356
<b>Total</b>	<b>\$170</b>	<b>\$4,705</b>
Rail Grade Crossing and Signal Safety Needs <sup>a</sup>	\$22	\$609

<sup>a</sup> Included in State and Non-State Highway needs estimates.

### 3.2 Summary of Rail Costs

Table 3.1 summarizes the rail capital estimated annual costs for the State of Nebraska. Because the rail grade crossing and signal safety needs are included in the state and non-state highway needs estimate, they are not included in the totals.

## ■ 4.0 Bicycle and Pedestrian Costs

Although pedestrian and bicycle travel are elements of any transportation system, it is difficult to define needs for these two elements of the system. Costs related to pedestrian travel might range from sidewalks along an urban street to a dedicated off-street trail. The boundary between public and private control of these types of facilities is often less clear than for other elements of the transportation system. Given the broad range of potential costs for the purposes of this report, costs are focused on major system improvements, namely, dedicated trail facilities.

The State of Nebraska has a statewide trails plan entitled, *A Network of Discovery: A Comprehensive Trails Plan for the State of Nebraska* (ANOD II). This document was published in 2004 and is an update to the original 1994 trails plan. This plan is in effect until 2014 and will then be updated by the Nebraska Game and Park Commission.

The estimates for bicycle and pedestrian costs include the cost of constructing multiuse trails within communities and between communities. Multiuse trail costs throughout the State are estimated at \$254 million to complete the total of 1550 miles of planned facilities. This would constitute an average annual expenditure of \$12.7 million per year for all of the multiuse trail facilities.

The trail system network described in the plan includes several of the following categories of trails:

- Trans-State Trails, which are signature long-distance facilities of both national and local importance;
- Primary Regional Trail (PRT) corridors, which are key trails for subregions within the State; and
- Community Trail systems, which identify key trails within each community.

There are three Trans-State Trails in the plan, and a possible fourth corridor is being considered, as shown in Figure 4.1. Trans-State Trails are detailed below and illustrated in Figure 4.1.

- **The American Discovery Trail (ADT).** The ADT trail is part of a coast-to-coast network of trails and connections between urban and rural areas. It covers approximately 450 miles between Omaha and the Colorado border near Julesburg.

### Trans-State Trails Map

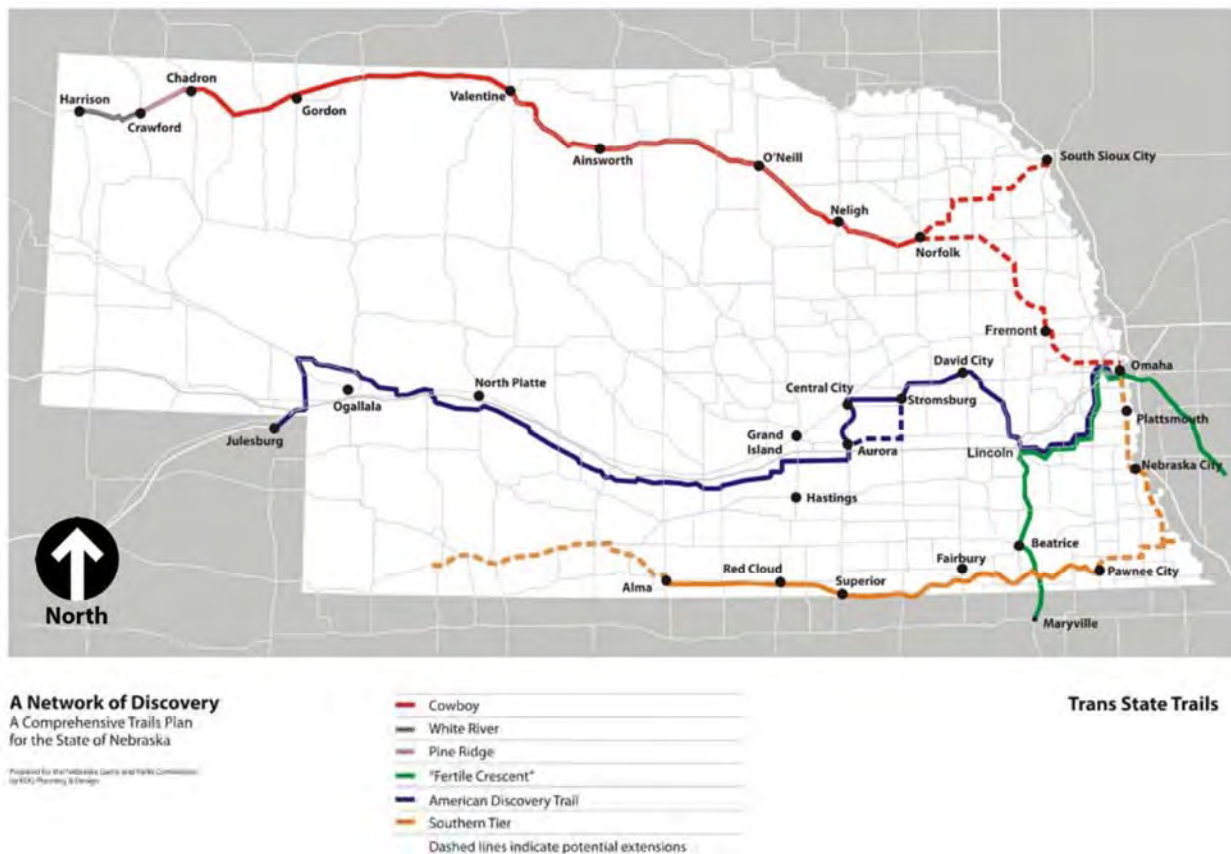


Figure 4.1 Source: *A Network of Discovery: A Comprehensive Trails Plan for the State of Nebraska*, p. 93.

- **The Cowboy Trail “Northern Tier”.** This trail is a recreational and nature trail between Norfolk and Chadron, with possible extensions to Omaha and/or South Sioux City. The entire corridor is 321 miles long with approximately 195 miles completed.
- **The Fertile Crescent Trail.** This trail is a 200-mile crescent-shaped trail that spans four states and includes the major Nebraska communities of Omaha, Lincoln, and Beatrice. Approximately 8 miles of this stretch is completed between Lincoln and Beatrice.
- **The Southern Tier Trail.** This trail would be located between Alma and Pawnee City with possible westward and eastward extensions to McCook and Indian Cave State Park. As of 2010, no connections have been made within the Southern Tier Trail.

A majority of the trail segments identified for each of the four Trans-State Trail are also included in the 19 PRT corridors shown in Figure 4.2. Each of the PRT corridors includes several Nebraska communities. There are recommendations for programmed or potential trails and for improved roadway cross-sections (i.e., shoulders) for accommodating bicyclists.

### Primary Regional Trail Corridors Map

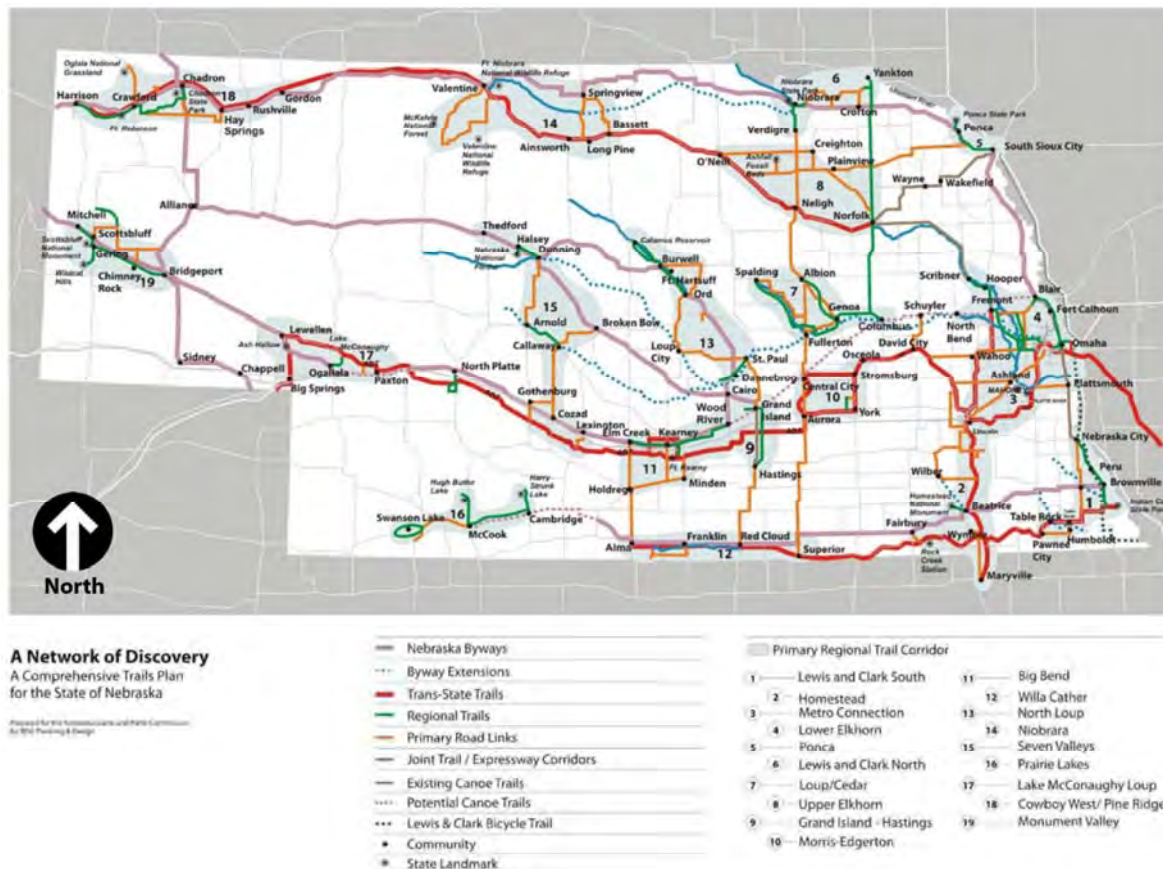


Figure 4.2 Source: *A Network of Discovery: A Comprehensive Trails Plan for the State of Nebraska*, p. 99.

Another important cost associated with trails is the ongoing maintenance and upkeep of the facilities. The annual maintenance cost items are typically handled by the operating agency and/or volunteers. Annual trail maintenance costs can range from \$1,000 up to \$7,000 per mile, which does not include the cost of reconstruction at the end of the pavement's lifetime. It is recommended that communities use volunteer groups such as Trails groups, scouting groups or other youth groups to assist them in cleaning up and maintaining their community trails.

A breakdown of the mileage and construction cost estimates for PRT corridors is provided in Table 4.1. The table includes all programmed and potential trails that are identified for each PRT.

**Table 4.1 Primary Regional Trail Corridors Costs**

Corridor	Cities in Corridors	Existing Miles	Planned Miles	Surface Type <sup>a</sup>	Planned <sup>b</sup> Trail Costs (Thousands)
Lewis & Clark South	Nebraska City, Brownsville	21	16.8	L/G	\$2,268
Homestead	Lincoln, Beatrice	8	51.5	L/G	\$6,952.5
Metro Connection <sup>c</sup>	Lincoln, Omaha				
Lower Elkhorn	Omaha, Fremont		20.0	L/G	\$2,700
Ponca	Ponca, South Sioux City		20.0	L/G	\$2,700
Lewis & Clark North	Yankton		69.0	L/G	\$7,425
Loup/Cedar	Columbus		55.0	L/G	\$2,750
Upper Elkhorn	Norfolk, O'Neill	76	0.0	L/G	\$0
Grand Island-Hastings			15.5	L/G	\$2,092.5
Morris-Edgerton	Aurora, York		55.0	L/G	\$7,525
Big Bend	Kearney		25.5	L/G	\$3,442.5
Willa Cather	Alma, Red Cloud		45.0	L/G	\$6,075
North Loup	Grand Island, St. Paul		94.0	L/G	\$12,690
Niobrara	Valentine, O'Neill	60	46.0	L/G	\$6,210
Seven Valleys	Broken Bow		27.5	L/G	\$3,712.5
Prairie Lakes	McCook, Cambridge		30.0	L/G	\$4,050
Lake McConaughy	Ogallala, Lewellan		38.0	L/G	\$5,130
Pine Ridge	Crawford, Chadron		6.0	L/G	\$810
Monument Valley	Gering, Scottsbluff		26.5	L/G	\$3,577.5
Northern Tier	Scribner to Norfolk		51.0	L/G	\$6,885
Southern Tier	Red Cloud, Brownsville		169.5	L/G	\$22,882.5
U.S. 81	Madison, Yankton		65.0	L/G	\$8,775
Cowboy Trail	Chadron, Valentine		139.0	L/G	\$17,375
American Discovery Trail	Osceola, Brainard		33.0	L/G	\$4,455
Total (2009 dollars)		165	1,099.0		\$140,483
<b>Total (Year of Expenditure Dollars)</b>		<b>165</b>	<b>1,099.0</b>		<b>\$146,948</b>

<sup>a</sup> Surface Types: L/G = limestone/granular stone.

<sup>b</sup> The limestone/granular stone trail construction cost is assumed to be \$125,000 per mile for the Cowboy Trail; and \$135,000 per mile for all other trails. Cost estimates are based on Nebraska Game and Parks Commission estimates and previous federally funded projects. Right of Way costs not included in estimate.

<sup>c</sup> The Metro Connection is assumed to be included in the Lincoln and Omaha community numbers.

The plan also identified existing and planned multiuse trails for numerous communities across the State. A breakdown of the mileage and cost estimates for construction of the community trails is provided in Table 4.2. The communities are grouped by population size.

**Table 4.2 Community Trails Costs**

Community Population	Number of Communities	Example Communities	Existing Miles	Planned Miles	Planned <sup>a</sup> Trail Costs (Thousands)
Less than 2,500	483	Battle Creek, Hooper, Laurel, O'Neill, Syracuse, Valley	182.91	47	\$11,150 <sup>b</sup>
2,500 to 10,000	33	Alliance, Crete, Gering, Nebraska City, Ralston, Wayne	72.34	88.6	\$21,037.5 <sup>c</sup>
10,000 to 50,000	16	Bellevue, Fremont, Kearney, Norfolk, North Platte, Scottsbluff	243.15	30.9	\$7,337.5 <sup>c</sup>
Greater than 50,000	2	Lincoln and Omaha	228.0	285.0	\$67,688 <sup>c</sup>
<b>Total (Year of Expenditure Dollars)</b>			<b>725.4</b>	<b>451.5</b>	<b>\$107,213</b>

<sup>a</sup> Construction cost for limestone trails is assumed to be \$125,000 per mile and \$250,000 per mile for concrete trails. Cost estimates are based on from federally funded projects in the past two years. Right-of-way costs are not included in estimate.

<sup>b</sup> It is estimated that 20 percent of new trails in these areas would be of a limestone/granular surface type and the other 80 percent would be concrete.

<sup>c</sup> It is estimated that 10 percent of new trails in these areas would be of a limestone/granular surface type and the other 90 percent would be concrete.

The construction cost per mile for the community trails is higher than for the primary regional trails due to the increased likelihood of using concrete for the trail surface within communities; in addition, urban environments can increase costs. A review of NDOR transportation enhancement funding for trails over the last few years showed concrete trail costs ranging from \$140,000 to nearly \$700,000 per mile, with an average cost of \$320,000 per mile. These prices are higher than the traditional trail unit costs of \$150,000 to \$200,000 per mile. Table 4.3 summarizes regional and community trail costs in year of expenditure dollars.



**Table 4.3 Regional and Community Trail Costs**

<b>Trail Category</b>	<b>Existing Miles</b>	<b>Planned Miles</b>	<b>Planned Trail Costs (\$ Thousands)</b>
Regional Trails	165	1,099	\$146,948 <sup>a</sup>
Community Trails	725.4	451.5	\$107,213 <sup>b</sup>
<b>Totals</b>	<b>890.4</b>	<b>1,550.5</b>	<b>\$254,161</b>

Notes: <sup>a</sup> All regional trails are assumed to be constructed of limestone/granular stone materials. Trail construction cost is assumed to be \$125,000 per-mile for the Cowboy Trail and \$135,000 per-mile for all other trails. Cost estimates are based on the last two years of NDOR transportation enhancement funding for multiuse trails. Right-of-way costs are not included in estimate.

<sup>b</sup> Construction cost for limestone community trails is assumed to be \$135,000 per-mile, while construction cost for concrete community trails is assumed to be \$250,000 per-mile.

## ■ 5.0 Airport Funding Needs

The *Nebraska Airport Capital Improvement Plan for Fiscal Years 2011-2030*, published in April of 2010, provides a detailed listing of proposed projects for each of the public use airports in the State of Nebraska. The Plan includes a brief summary and a one page list of capital projects for each airport in the planning period. The airport sponsors are given the opportunity every year to update the capital needs at their airport.

The airports are classified as national, regional, local, or limited in the plan depending on the demand for aviation services at the airport. Each category sets minimum standards that will be met through the projects in the capital improvement plan. A complete list of Nebraska's public use airports, along with their classifications, is in the following table.

**Table 5.1 Nebraska Airport Classifications**

Airport	Classification	Airport	Classification	Airport	Classification
Ainsworth	Regional	Fremont	National	Omaha-Millard	Regional
Albion	Regional	Genoa	Limited	Omaha-North Omaha	Local
Alliance	National	Gordon	Regional	O'Neill	Regional
Alma	Limited	Gothenburg	Limited	Ord	Regional
Arapahoe	Limited	Grand Island	National	Oshkosh	Local
Atkinson	Local	Grant	Local	Pawnee City	Limited
Auburn	Local	Hartington	Local	Pender	Limited
Aurora	Local	Harvard	Limited	Plattsmouth	National
Bassett	Limited	Hastings	National	Red Cloud	Local
Beatrice	National	Hay Springs	Limited	Rushville	Limited
Blair	Regional	Hebron	Local	Sargent	Limited
Bloomfield	Limited	Holdrege	Regional	Scottsbluff	National
Broken Bow	Regional	Hyannis	Local	Scribner	Local
Burwell	Limited	Imperial	Regional	Seward	Regional
Cambridge	Local	Kearney	National	Sidney	National
Central City	Local	Kimball	Regional	South City	Local
Chadron	National	Lexington	Regional	Sioux City	Local
Chappell	Limited	Lincoln	National	Superior	Regional
Columbus	National	Loup City	Local	Tecumseh	Limited
Cozad	Local	McCook	National	Tekamah	Local
Creighton	Local	Minden	Local	Theftord	Local
Crete	Regional	Nebraska City	Regional	Trenton	Limited
Curtis	Local	Neligh	Regional	Valentine	National
David City	Local	Norfolk	National	Wahoo	Regional
Fairbury	Local	North Platte	National	Wallace	Local
Fairmont	Local	Ogallala	Regional	Wayne	Regional
Falls City	Regional	Omaha- Eppley	National	York	National

Source: Nebraska Airport Capital Improvement Plan.

While future federal and state funding is shown in the plan, it should be noted that the funds are estimates and actual funding is uncertain. The federal Airport Improvement Plan expired in September 2007 and has not been reauthorized. The funding levels and structure of a future federal program are unknown. Future state funds are also uncertain. In 2010, funds were not allocated to the state grant fund due to budget shortfalls. State grant funds are also not expected to be available in 2011. The Capital Improvement Plan assumes that funding will return to historical levels in the short term. If not, capital projects will be delayed until funding becomes available. Federal funding is distributed based on a priority system. State funds are allocated by the Nebraska Aeronautics

Commission, a five member board appointed by the governor. The following table summarizes the future airport funding needs

**Table 5.2 Airport Funding Needs**

<b>Airport 20-Year Funding Needs</b>				
<b>Costs in Millions of Dollars</b>				
	<b>Federal</b>	<b>State</b>	<b>Local/Private</b>	<b>Total</b>
National	\$230.8	\$2.4	\$85.5	\$318.7
Regional	\$79.1	\$0.9	\$30.0	\$110.0
Local	\$56.1	\$4.7	\$27.4	\$88.2
Limited	\$22.0	\$1.9	\$11.7	\$35.7
<b>Statewide</b>	<b>\$388.0</b>	<b>\$9.9</b>	<b>\$154.7</b>	<b>\$522.6</b>

Source: Nebraska Department of Aeronautics

## ■ 6.0 Summary of Transportation Needs and Costs

The capital needs and costs for each of the transportation modes described in this document are summarized in Table 6.1. The freight rail infrastructure costs are condensed from the ranges described in the text to a single-point estimate equal to the midpoint of the range.

**Table 6.1 Summary of Total Nebraska Capital Needs and Costs for All Transportation Modes (In Millions)**  
*Year of Expenditure Dollars*

Category	Needs/Costs (20-Year)
<b>Highway</b>	<b>\$13,809</b>
NDOR's State Highways	\$13,809
Other Agencies Highways	N/A
<b>Transit</b>	<b>\$226</b>
Omaha-Lincoln-Sioux City	\$180
Rural	46
<b>Freight Rail</b>	<b>\$4,705</b>
<b>Bicycle and Pedestrian</b>	<b>\$254</b>
Primary Regional Trails	\$147
Community Trails	\$107
<b>Airport</b>	<b>\$523</b>
<b>Total Multimodal</b>	<b>\$19,517</b>

N/A = Not Available

