

# **Study of Iowa's Current Road Use Tax Funds (RUTF) and Future Road Maintenance and Construction Needs**

**A report to the Iowa Legislature, per Section 85,  
House File 868, 81st General Assembly**

Prepared by  
Iowa Department of Transportation

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## **Introduction**

The 81<sup>st</sup> General Assembly of the Iowa legislature, in Section 85 of House File 868, required the Iowa Department of Transportation (Iowa DOT) to conduct a study of current Road Use Tax Fund (RUTF) revenues, and projected roadway construction and maintenance needs. Specifically the legislation requires the following:

“The state department of transportation shall review the current revenue levels of the road use tax fund and its sufficiency for the projected construction and maintenance needs of city, county, and state governments in the future. The department shall submit a written report to the general assembly regarding its findings on or before December 31, 2006. The report may include recommendations concerning funding levels needed to support the future mobility and accessibility for users of Iowa's public road system.”

Consistent with recent actions involving the review and analysis of all public roadways in the state, the Iowa DOT elected to conduct this study with input from city and county officials. These officials represent the ‘three legs of the stool’ critical to maintain and operate the public roadway system in Iowa. Special acknowledgement is given to the following representatives who provided vital input into the development of this report.

Greg Reeder, Council Bluffs city engineer  
Jeff May, Knoxville public works director  
Royce Fichtner, Marshall County engineer  
Tom Stoner, Harrison County engineer

Iowa DOT also acknowledges Scott Newhard (Associated General Contractors of Iowa) and Dave Scott (Iowa Good Roads Association) for facilitating the discussions between the Iowa DOT, city and county officials.

Iowa DOT consulted with other groups with strong interest in Iowa’s transportation system. A complete list of groups and associations which provided input is included in Appendix A.

## **Executive Summary**

The 81<sup>st</sup> General Assembly of the Iowa legislature, in Section 85 of House File 868, required the Iowa Department of Transportation (Iowa DOT) to conduct a study of current Road Use Tax Fund (RUTF) revenues, and projected roadway construction and maintenance needs. With input from Iowa's cities, counties and other interested groups, the Iowa DOT completed this report for submittal to the legislature.

### **Findings and Recommendations**

As with the rest of the nation, Iowa is on the verge of a transportation crisis. This is the result of flattening revenues, dramatically increasing construction costs, aging infrastructure, increasing usage, and deferred maintenance. While the system is not yet broken, it is at the tipping point where the cost to recover will grow exponentially if action is not taken now. As documented in this report, Iowa is already facing a \$27.7 billion shortfall in the next 20 years.

The \$27.7 billion shortfall represents an ideal level of investment which cannot be fully funded in light of the needs that exist for all levels of government and the services they provide. However, there are critical needs that must be met to avert a transportation crisis. The Iowa DOT worked with city and county officials to identify those improvements that would provide the greatest benefit to preservation of the system as well as those improvements that would provide the greatest economic development opportunities.

At the state level, critical needs exist on the interstate and Commercial and Industrial Network (CIN). These systems are vital to the economic growth and prosperity of Iowa. From the input received during the development of this study, and received by the Iowa Transportation Commission, it is clear that to maintain and grow Iowa's economy significant investments on the interstate and CIN are necessary to provide all regions of Iowa with access to high-quality transportation, which is reliable and efficient. Absent additional funding, it will either be impossible or take a very long time to complete improvements on corridors such as U.S. 20, U.S. 30, U.S. 34, U.S. 61, U.S. 63, U.S. 169, and many others.

At the county level, the large number of structurally deficient bridges and deteriorating conditions on the Farm-to-Market Road System are impacting the efficient movement of people and goods. If these needs are not addressed, more bridges will have to be closed and roads vital to the movement of agricultural products will deteriorate, impacting local, regional and statewide economies. These roadways and bridges are even more important with Iowa's burgeoning biofuels industry.

Cities are facing issues similar to the Iowa DOT and counties, with deteriorating pavement conditions, deferred/reduced maintenance, and the inability to meet the demand for new and/or expanded roadways. The highest priority needs for Iowa's cities are a backlog of maintenance needs critical to supporting and encouraging economic development.

Through the development of this report, the Iowa DOT, city and county officials reached consensus on the following points:

- Existing RUTF revenues should continue to flow through the existing distribution formula, and any natural growth in those revenues should also continue to flow through the existing distribution formula.
- If new funding sources are created or existing funding sources increased, the new revenue should be placed in a new fund.
- If a new fund is created, it should be distributed through a new formula (60 percent to the state, 20 percent to the cities and 20 percent to the counties) and targeted to particular needs that best enhance and support Iowa's rural and urban economies.
- The minimum amount of new funding needed today to meet the most critical needs to sustain and enhance Iowa's economy is \$200 million per year.
- Implementation of funding increases can be phased in over two years to better manage the impact on users.
- Any additional new revenue generated beyond \$200 million should be distributed through the existing RUTF distribution formula.
- The additional revenue targeted to critical needs in Iowa will result in improvements that have the greatest impact on sustaining and enhancing Iowa's economy; however, it still falls well short of meeting all the needs that exist on Iowa's public roadway system. On a system-wide basis, it is expected that even if the recommended funding level is achieved, pavement and bridge infrastructure will continue to worsen, although at a slower pace. It is also expected that on low-volume county roads, road and bridge conditions will continue to worsen resulting in more closed bridges, bridges with load restrictions and roads being classified as area service 'b' or area service 'c.'

It is important to note that the points listed above are all inter-related and in their entirety result in consensus among Iowa DOT, city and county officials. Therefore, it is important that the recommendations are evaluated as a package of recommendations, rather than a list of individual recommendations for consideration.

Based on the findings of the study, the following actions are recommended and endorsed by the Iowa DOT, Iowa County Engineers Association, Iowa State Association of County Supervisors, Iowa State Association of Counties, and Iowa League of Cities:

**1) Create a *Transportation Investment Moves the Economy in the 21<sup>st</sup> Century (TIME-21) Fund***

Additional investment in Iowa's public roadway system is vital to sustain and grow our state's economy. This new fund will target new revenue to those areas particularly important to Iowa's economy.

TIME-21 funding for the Primary Road System will be spent on the interstate and CIN system. This will permit continued development of corridors critical to connect Iowa with regional, national and international markets. Further improvements will increase

efficiency and safety resulting in economic growth to all regions of the state. With additional revenue from the TIME-21 Fund to help meet the needs of the interstate and CIN, a greater amount of existing RUTF revenue becomes available to address needs on the rest of the Primary Road System, which otherwise would not be addressed for many years.

At the county level, funding will be targeted heavily toward replacing deficient bridges. These bridge deficiencies hinder the efficient movement of agricultural products and jeopardize medical and fire services in rural Iowa. Enhancements to the Farm-to-Market Road System will also be targeted. This system of county roads serves a key role in the support and development of Iowa's value-added agriculture economy. Improvements to the Farm-to-Market Road System are needed to assure efficient movement of products to market and, in particular, value-added biofuel industries. The Farm-to-Market Road System is also taking on an increasing role in support of the commuting of rural Iowans to jobs in regional and metropolitan centers.

At the city level, each community will assess its own unique needs. Many will target funding toward sustaining the overall street network. This will be accomplished by directing resources first to cost-effective maintenance. This will allow cities to budget other local, state and federal funds to streets that are critical to economic growth and development. Reconstruction, expansion and safety will be priorities after maintenance needs are addressed.

## **2) Enact Changes to the Iowa Code that Generate a Minimum of \$200 Million in New Revenue for the TIME-21 Fund**

The TIME-21 Fund will ultimately require a minimum of \$200 million per year of funding. This funding will be generated using a mechanism or mix of mechanisms described in the "Options for Addressing Funding Shortfall" section of this study. Any funding generated beyond the \$200 million necessary for the TIME-21 Fund should be distributed via the existing RUTF distribution formula.

Consistent with past RUTF revenue increases, it is recommended any increase in revenue be phased-in over two years.

## **3) Establish a 60 Percent State, 20 Percent City and 20 Percent County Funding Distribution Formula for the TIME-21 Fund**

To address critical needs and to maximize the impact of additional revenues, the TIME-21 Fund should be distributed as follows:

- 60 percent to the state for use on the interstate and CIN;
- 20 percent to cities, on a per capita basis, via the Street Construction Fund of the Cities to sustain and improve the Municipal Street System; and
- 20 percent to counties via the Secondary Road Fund for use on all secondary road bridges and maintenance and construction improvements on the Farm-to-Market Road System. The Secondary Road Fund is distributed to counties using a formula based on area, miles of road, vehicle miles of travel, rural population, and length of bridges.

#### **4) Continue Evaluation of Alternative Funding Mechanisms**

The alternative funding mechanisms evaluated as part of this study, but not adopted by the legislature as funding sources, warrant additional study. For example, the per-mile user fee, which is not technically possible now, may be the best solution to assess user fees in an equitable manner as the country eventually moves toward alternative-fueled vehicles. The Iowa DOT should continue to study alternative funding sources and report at least every five years to the legislature on the advantages and disadvantages, and viability of alternative funding sources.

#### **5) Perform Regular Reevaluation of Needs and Revenues and Report to the Legislature**

As documented in this report, there are many issues impacting the Iowa DOT's, cities' and counties' ability to address the needs of the public roadway system. These issues include the rapid changes in construction costs, level of all sources of funding, rising volume of freight movements, increasing ethanol/biodiesel production, changing commuting patterns, aging population, and many others. As a result of this dynamic environment, it is prudent to reevaluate, on a regular basis, the long-range maintenance and construction needs of the public roadway system, and the ability of existing RUTF revenues (including new TIME-21 Fund revenues) to meet those needs. The Iowa DOT, in consultation with cities, counties and other interested parties, should be directed to conduct a study similar to this one at least every five years and provide a written report to the legislature summarizing the study.

**Absent additional revenue for the public roadway system, Iowans can expect a dramatic decrease in pavement and bridge conditions in the coming years. In addition, congestion in and around urban areas and along much of the interstate (rural and urban) will increase significantly. Finally, corridor improvements on the CIN will not be addressed. All of these impacts to the public roadway system end up damaging Iowa's economy. Transportation costs will increase for both the public and businesses and opportunities for economic development will be lost to other states.**

#### **Background**

As part of the development of this report, many aspects of transportation were analyzed in detail. The results of that effort are in the full report and are summarized below.

##### *Iowa's Public Roadway System Description*

The public roadway system in Iowa consists of nearly 114,000 miles of highways, roads and streets, and almost 25,000 bridges. The jurisdictional responsibility of those roads is described along with information on mileage and travel for each system. Table 1 is a summary of the systems.

Table 1 – Mileage and Vehicle Miles of Travel (VMT) by System

	Mileage* (as of January 1, 2006)	% of Total Mileage	2005 Total VMT (1,000,000s)	% of Total VMT	2005 Large Truck VMT (1,000,000s)	% of Total Large Truck VMT
Primary	9,372.66	8.2%	19,208	60.8%	2,491	88.3%
Secondary	90,075.12	79.2%	5,481	17.4%	286	10.1%
Municipal	14,338.75	12.6%	6,879	21.8%	45	1.6%
Total	113,786.53		31,568		2,822	

Source: Iowa DOT – Office of Transportation Data

\* This table and report do not include the small amount of mileage within Iowa’s parks and institutions.

### *Funding*

Iowa’s public roadway system is supported by revenue through three major sources --- federal, state and local governments. Federal funding is primarily generated from federal fuel tax and used for construction improvements. In Federal Fiscal Year (FFY) 2007, the state of Iowa is expected to receive \$306 million in federal funding, with \$205 million allocated to the state and \$101 million allocated to cities and counties.

State revenues for Iowa’s public roadways come from the Iowa Road Use Tax Fund (RUTF). The RUTF consists of revenues from fuel tax, registration fees, use tax, driver’s license fees, and other miscellaneous sources. In FY 2007 it is estimated the RUTF will receive approximately \$1.1 billion, approximately 40 percent coming from fuel tax, 36 percent coming from registration fees and 20 percent coming from use tax. After some off-the-top allocations for programs such as Revitalize Iowa’s Sound Economy (RISE), motorcycle education, Living Roadway Trust Fund, and state park and institutional roads, Iowa’s RUTF is distributed by formula to the state for use on the Primary Road System (47.5 percent), to counties for use on the Secondary Road System (24.5 percent) and Farm-to-Market Road System (8 percent), and to cities for use on the Municipal Street System (20 percent).

Cities and counties also receive funding for their roadways from local revenue sources. Typical sources include property taxes, local option sales tax, tax increment financing districts, bonding (primarily for cities), and assessments. The amount of local revenue each city and county receives varies based on local taxing decisions.

### *Importance of Transportation*

An efficient transportation system is essential for the future economic health of the state. Improvements to our public roadway system lower costs for producers and consumers, and make Iowa more attractive in a highly competitive market for jobs and industry. Failure to maintain our public roadway system will result in lost jobs and opportunities for economic development to neighboring states. Transportation investments support economic development, our quality of life, protect our environment, and enhance safety.

### *Factors Impacting Transportation*

There are many factors impacting transportation in Iowa and the nation. All of these factors are resulting in an increase in maintenance and construction needs on Iowa's public roadway system. The factors include increasing travel, increasing freight movements, changing demographics, increasing ethanol/biodiesel production, increasing construction/maintenance costs, decreasing pavement and bridge conditions, and flattening or reduced funding levels. To address these factors the Iowa DOT, cities and counties have all taken steps to increase efficiency and reduce administrative costs.

### *Evaluation of Future Needs*

For the purposes of this report, public roadway system needs were estimated over the 20-year period from 2005 through 2024. The 20-year projected needs for Iowa's public roadway system are \$67.2 billion. The Primary Road System has total needs of \$27 billion, the Secondary Road System \$23.4 billion and the Municipal Street System \$16.8 billion.

The \$67.2 billion in needs of Iowa's public roadway system represents the total cost to address all deficiencies that exist now or are forecast to exist in the next 20 years. This does not take into account the fact that some of the needs have a cost that exceed the benefits to the state. In an attempt to evaluate the rate of return of different improvement types and recognizing the needs will far exceed available revenue over the next 20 years, an effort was made to prioritize needs based on minimum thresholds for preservation of the system and then the economic benefits of different types of improvements on roads with different traffic levels. The full report documents the prioritization of needs among the state, cities and counties.

### *Evaluation of Future Revenues*

Based on historic trends and an analysis of how those trends will change in the future, federal, state and local revenues were forecast for the next 20 years. From 2005 to 2024, the Primary Road System is forecast to receive \$15.2 billion, Secondary Road System \$10.9 billion and Municipal Street System \$13.4 billion. This totals \$39.5 billion, which is \$27.7 billion short of the \$67.2 billion in estimated needs.

### *Needs versus Revenues*

The estimate of future revenues will allow all maintenance and administration needs (category 1) to be met, and most of the next highest priority of needs, which addresses pavement and bridge preservation needs on higher volume roads (category 2). To fully address the higher-volume preservation needs the most critical needs of the next priority category (category 3) an additional \$200 million per year of funding is needed. Of the unfunded category 2 and category 3 needs that can be addressed with \$200 million per year of additional funding, 70 percent are on the Primary Road System, 14 percent on the Secondary Road System, and 16 percent on the Municipal Street System. Recognizing that this is a significant shift from the existing RUTF distribution percentages and that

each jurisdiction prioritizes their needs differently, the following distribution of additional RUTF revenues is proposed:

- State of Iowa – Primary Road System: 60 percent
- Counties – Secondary Road System: 20 percent
- Cities – Municipal Street System: 20 percent

### Options for Addressing Funding Shortfall

Table 14 is a summary of existing RUTF revenue sources and options for generating increased revenue. Table 15 is a list of revenue mechanisms that are not currently utilized, but could be implemented to generate additional RUTF revenue.

Table 14 – Current RUTF Revenue Sources and Increase Options

Type of Financing	Description	Advantages	Disadvantages
<b>Fuel Tax</b>	<p>Cents per gallon tax on motor fuels, including some alternative fuels</p> <p><b>Option A to Increase Revenue:</b> Increase per-gallon tax on motor vehicle fuels equally for gasoline, gasohol and diesel based on existing rates of 21.0 cents per gallon for gasoline, 19.0 cents per gallon for gasohol and 22.5 cents per gallon for diesel (this assumes the gasohol subsidy will be extended beyond its 6/30/07 sunset)</p> <p>Each additional cent generates approximately \$22 million to the RUTF</p> <p><b>Option B to Increase Revenue:</b> Adjust fuel tax annually based on an inflation index (such as the Consumer Price Index)</p> <p>Additional revenue depends on rate of inflation. For example, a 3 percent increase in the Consumer Price Index applied to current fuel tax rates would generate an additional \$13 million annually.</p>	<ul style="list-style-type: none"> <li>• Collection and administration process already in place</li> <li>• Generally proportional to system usage</li> </ul>	<ul style="list-style-type: none"> <li>• Increased fuel efficiency results in lower revenue</li> <li>• Higher fuel prices lead to reduced driving and reduced fuel tax collections</li> <li>• Fees are fixed and do not adjust for inflation</li> </ul>
<b>Vehicle Registration</b>	<p>Fees charged to register and license vehicles and trailers</p> <p><b>Fee Schedule for Automobiles, Mini-Vans and Sport Utility Vehicles</b>  <math display="block">\text{Fee} = 1 \text{ percent of value} + \frac{\\$0.40 \times \text{Weight}}{100}</math> <ul style="list-style-type: none"> <li>• &lt; 5 model years old: value component of fee is not reduced</li> <li>• 5 model years old: 75 percent of value component is applied</li> <li>• 6 model years old: 50 percent of value component is applied</li> <li>• &gt;= 9 model years old: \$35 (1994 and newer model year)</li> <li>• The fee schedule varies based on age, type of vehicle and other factors for older model year vehicles</li> </ul> <p><b>Fee Schedule for Pickups (all trucks &lt;= 3 tons)</b></p> <ul style="list-style-type: none"> <li>• ≤ 10 model years old: \$65 per year</li> <li>• 11 to 13 model years old: \$55 per year</li> <li>• 14 to 15 model years old: \$45 per year</li> <li>• &gt;15 model years old: \$35 per year</li> </ul> <p><b>Option A to Increase Revenue:</b> Increase the registration fee for pickup trucks making it equivalent to automobiles (i.e. vehicle weight and value). It would generate approximately \$57 million annually to the RUTF, if applied to all pickup trucks currently registered at 3, 4 and 5 tons.</p> <p>If weight-value adjustment applies only to model year 2009 and later pickups (phased in approach), the additional revenue to the RUTF is projected as follows:</p> <ul style="list-style-type: none"> <li>• CY 2008: \$10 million</li> </ul> </p>	<ul style="list-style-type: none"> <li>• Collection and administration process already in place</li> <li>• Equitable for cars</li> </ul>	<ul style="list-style-type: none"> <li>• Not proportional to system usage</li> <li>• Higher administrative and enforcement costs</li> <li>• Not equitable for pickups</li> <li>• Encourages retention of older vehicles</li> </ul>

	<ul style="list-style-type: none"> <li>• CY 2009: \$20 million</li> <li>• CY 2010: \$30 million</li> <li>• CY 2011: \$40 million</li> </ul> <p><b>Option B to Increase Revenue:</b> Increase the minimum vehicle registration fee (i.e. \$50 minimum instead of variable minimum for autos and \$35 minimum for trucks). This scenario would generate approximately \$19 million annually in additional revenue to the RUTF.</p>		
<b>Use Tax on Motor Vehicles</b>	<p>Five percent use tax that is imposed on the sale of new and used motor vehicles and trailers</p> <p><b>Option to Increase Revenue:</b> Increase the use tax to 6 percent, generating approximately \$40 million annually.</p>	<ul style="list-style-type: none"> <li>• Collection and administration process already in place</li> <li>• Provides revenue source based on ability to pay</li> <li>• Proportional to cost of vehicle</li> </ul>	<ul style="list-style-type: none"> <li>• Not proportional to system usage</li> <li>• May discourage sales of motor vehicles</li> <li>• Fluctuates with economic cycles</li> </ul>
<b>Driver's License Fee</b>	<p>A fee charged for the privilege to operate a motor vehicle</p> <p>\$4 per year (non-commercial)* \$8 per year (commercial)*</p> <p>* Does not include the one-time surcharge assessed through 6/30/08 for the driver information system update (\$3).</p> <p><b>Option A to Increase Revenue:</b> Doubling the driver's license fee would generate approximately \$12 million annually.</p> <p><b>Option B to Increase Revenue:</b> Institutionalize the current \$3 surcharge as an increase as of 7/1/08. It would generate approximately \$1.5 million per year, on average, beginning in FY 2009</p>	<ul style="list-style-type: none"> <li>• Collection and administration process already in place</li> <li>• Does not fluctuate with economic cycles</li> </ul>	<ul style="list-style-type: none"> <li>• Not proportional to system usage</li> </ul>

Table 15 – Potential RUTF Revenue Sources

Type of Financing	Description	Advantages	Disadvantages
<b>Sales Tax</b>	<p>Assess sales tax on fuel purchases.</p> <p>A 1 percent sales tax on fuel would generate approximately \$43 million per year based on fuel prices in November 2006.</p>	<ul style="list-style-type: none"> <li>• Provides a mechanism to apply local option sales tax on the purchase of fuel</li> <li>• Requires less frequent legislative action on fuel tax because revenues will increase as the price of fuel increases</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Administration and collection system would need to be developed</li> <li>• Because tax is tied to the price of fuel, the amount of tax could change significantly if fuel prices experience large fluctuations</li> </ul>
<b>Severance Tax on Exported Ethanol</b>	<p>A tax collected by the state either based on a percent of value or a volume-based fee on resources extracted from the earth that are exported out of the state. Typically charged to producer or first purchaser.</p> <p>Potential revenue dependent on rate set and volume exported. Assuming 65 percent of Iowa's ethanol production (1.5 billion gallons in CY 2006) is shipped out of the state, a severance tax of 1 cent per gallon would generate \$9.75 million per year.</p>	<ul style="list-style-type: none"> <li>• Creates opportunity to generate revenue from sources outside of Iowa</li> <li>• Compensates for roadway deterioration resulting from usage of system for the production of ethanol</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Administration and collection system would need to be developed</li> <li>• Potential regulatory issues</li> <li>• Could put the producer at competitive disadvantage</li> </ul>

<p><b>Per-Mile Tax</b></p>	<p>Tax based on the vehicle miles traveled within a state.</p> <p>Based on the vehicle miles traveled in Iowa in 2005 (31.6 billion), a 1 cent per-mile fee would generate \$316 million per year.</p>	<ul style="list-style-type: none"> <li>• More direct measure of actual costs incurred</li> <li>• Highly related to needs for capacity and system preservation because as travel increases, the need for capacity and preservation improvements increase, but so does revenue</li> <li>• Low tax rate needed to fund current needs</li> <li>• May be graduated based on vehicle size, weight, emissions or other characteristics</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Administration and collection system would need to be developed</li> <li>• Potentially high administrative, compliance and infrastructure costs</li> <li>• Technology needs to mature</li> <li>• Privacy concerns</li> </ul>
<p><b>Transportation Improvement District</b></p>	<p>Geographic areas are defined and tax imposed within the area to fund transportation improvements with voter approval.</p> <p>Revenue potential varies</p>	<ul style="list-style-type: none"> <li>• Satisfies urgent infrastructure needs, which exceed available finances</li> <li>• Encourages state, local and private-sector partnerships</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Administration and collection system would need to be developed</li> <li>• May be seen as an equity issue</li> </ul>
<p><b>Bonds for Primary Road System Improvements</b></p>	<p>A written promise to repay borrowed money at a fixed rate on a fixed schedule. Can be limited to very specific situations, such as projects that exceed a certain dollar threshold, projects that cannot easily be phased over time (border bridges) and/or projects that can reasonably generate sufficient revenue (tolls) to service their own bond debts.</p> <p>Revenue potential varies.</p>	<ul style="list-style-type: none"> <li>• Allows earlier and faster construction of facilities</li> <li>• Satisfies urgent infrastructure needs, which exceed available finances</li> <li>• Avoids inflationary construction costs</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Requires state or community to extend payments for long periods of time</li> <li>• Does not generate new money</li> <li>• May cost more over time due to bond interest</li> <li>• Requires annual resources be used for debt service rather than new needs</li> </ul>
<p><b>Privatization</b></p>	<p>Long-term leasing of toll roads to private sector for up-front payment.</p> <p>Revenue potential varies.</p>	<ul style="list-style-type: none"> <li>• Influx of one-time capital</li> <li>• Shifts responsibility to contractor</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Administrative process needed to let, execute, contract, and monitor performance</li> <li>• Requires high-usage corridor to be marketable; Iowa may not have any candidates</li> <li>• Built-in toll increases</li> <li>• Potentially higher tolls to make project profitable</li> <li>• Requires very long-term decision that removes flexibility</li> <li>• Very limited ability for in-state contractors to participate in construction</li> </ul>
<p><b>Tolling</b></p>	<p>Implementing fees to travel on road segments.</p> <p>Revenue potential varies based on length of tolled segment and toll rate, but a typical rate is 6 cents per mile.</p>	<ul style="list-style-type: none"> <li>• Specific road segments/corridors generate their own revenue</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Expensive to initiate due to needed capital investment</li> <li>• Ongoing administrative costs</li> <li>• Requires sufficient traffic levels to generate enough revenue to pay for the costs of tolling, along with the maintenance and construction cost; Iowa may not have any reasonable corridors meeting requirements.</li> <li>• Public resistance may lead to adjustments in travel patterns to avoid tolls</li> <li>• There are federal restrictions in some cases</li> </ul>

<p><b>Development Impact Fees</b></p>	<p>A fee charged to developers for off-site infrastructure needs that arise as a result of new development.</p>	<ul style="list-style-type: none"> <li>• Additional source of funding to offset increased needs due to new development</li> <li>• Places the cost of improvement on the development that caused the need</li> </ul>	<ul style="list-style-type: none"> <li>• Typically a local jurisdiction fee and is difficult to apply statewide</li> <li>• Potential negative impact on future development</li> <li>• Can be difficult to establish and administer</li> <li>• Can be an equity issue when costs are passed on to homeowners in the case of a housing development</li> </ul>
<p><b>Public-Private Partnerships (PPPs)</b></p>	<p>Contractual agreements formed between a public agency and private sector entity that allow private participation in the delivery of transportation projects.</p> <p>Revenue potential varies.</p>	<ul style="list-style-type: none"> <li>• Expedited completion compared to conventional delivery methods</li> <li>• Avoids inflationary construction costs</li> <li>• Delivery of new technology developed by private entities</li> <li>• Substitution of private resources and personnel for constrained public resources</li> <li>• Access to new sources of private capital</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• May be less efficient</li> <li>• Could lead to higher tolling than under a public-only project</li> <li>• Very limited ability for in-state contractors to participate in construction</li> </ul>

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## **Importance of Transportation**

An efficient transportation system is essential for the future economic health of the state. Improvements to our public roadway system lower costs for producers and consumers, and make Iowa more attractive in a highly competitive market for jobs and industry. Failure to maintain our public roadway system will result in lost jobs and opportunities for economic development to neighboring states. Iowa needs to take advantage of its central location at the crossroads of major highway and railroad systems; to attract new and retain existing businesses across the state.

Iowans must have access to safe transportation services in all areas of the state to ensure personal mobility for work, pleasure and needed services. Maintaining a safe and congestion-free transportation system is critical for all to experience the quality of life we have come to expect in Iowa.

## **Economic Development and Support**

Each year vehicles in Iowa travel over 31 billion miles on Iowa's public roadway system. Nearly \$390 billion worth of freight is hauled. These numbers alone demonstrate the vital role Iowa's public roadways play in our economy. Without this roadway system people could not get to work; there would be no access to healthcare, education and recreation; farmers would not be able to get their goods to market; and manufacturers would be unable to ship their products or receive supplies. In short, the economy would shut down. But just having a public roadway system is not enough. The system must be well maintained, efficient, reliable, and accessible.

Manufacturers rely more and more on just-in-time delivery which means much of the inventory they previously kept in their warehouse is now on trucks on the public roadway system for delivery to the plant at the time the manufacturer needs the supplies. It is critical to the economy that the roadway system supports consistent and reliable transportation so that just-in-time delivery is successful. This requires a roadway system that is in good condition, has adequate capacity and is well-maintained, even in inclement weather.

Investments in the public roadway system support the economy through: 1) direct job creation through construction activities; 2) indirect and induced job support; and 3) productivity gains. Iowa supports a sizable road construction industry. To support and grow that industry, investment in Iowa's public roadway system must keep pace and grow. Recent studies show that every \$1 billion in highway investment creates or supports 44,700 jobs. (Federal Highway Administration, *Frequently Asked Questions About Highways and the Economy*, <http://www.fhwa.dot.gov/policy/12a-faq.htm>) Those 44,700 jobs include the creation of 8,400 full-time construction jobs (direct jobs), the support of 20,900 jobs by material purchase and administrative and professional services in the construction industry (indirect jobs), and support of 15,400 jobs in other industries in the economy when construction industry wages are spent on goods and services. As opposed to other public investments to support and enhance the economy, public investments in the roadway system have an almost immediate impact in realizing associated benefits.

In addition to job creation and support, productivity gains are realized by investments that reduce travel times, make travel times more consistent (critical for just-in-time delivery), reduce crashes, and reduce vehicle operating costs. Studies show that every dollar increase in net highway capital (i.e., investments to improve the highway system) creates 30 cents of ‘cost saving’ producer benefits annually. (Federal Highway Administration, *Frequently Asked Questions about Highways and the Economy*, <http://www.fhwa.dot.gov/policy/12a-faq.htm>) The same studies show that on average, 25 percent of the yearly productivity growth rate in the United States is due to highway investments. Companies across Iowa attest to the importance of the roadway system in terms of location, capacity and condition to their ability to succeed because in today’s economy, “time is money.”

Many areas of the state are seeking public roadway improvements that they believe are critical to support existing and assure future economic development. Transportation costs are a major cost of doing business, which means a high-quality public roadway system is necessary to attract new businesses and support the growth of existing developments.

### **Quality of Life**

One of Iowa’s greatest resources is the quality of life that exists within its borders. Transportation services support Iowans with many quality of life benefits. Iowans value the ability to move and travel with ease. Our public roadway system provides the primary means to access recreation, education, health care, and services. Increasingly, these quality of life issues are also critical to local economic development. Companies want good roads not only for business purposes, but to attract and support a stable workforce. High levels of accessibility and mobility are key to experiencing the quality of life Iowa has to offer.

### **Environment**

Transportation improvements are often thought to be a negative impact on the environment. While that may have been true to some extent when public roadways were first being built, now transportation improvements are made in a manner that enhances the environment and natural resources. If there are negative impacts to the environment, they are mitigated by actions that not only restore, but often result in an improvement of, the area. For example, when wetlands are impacted by transportation projects, new wetlands are created. In most cases more wetland acreage is created than was impacted by the project. In the aggregate, the Iowa DOT, cities and counties restore wetlands on a 1.5 acre restored to 1 acre impacted ratio.

Governments in Iowa have also been proactive in the introduction of native grasses along roadway right-of-ways. On the Primary Road System, the Transportation Commission has invested in the planting of native grasses that reduce mowing costs, minimize impacts of run-off from the highway pavement, provide native habitat, and add color and interest to the roadway environment.

County road departments often include hydraulic grade control structures as an integral design element in their drainage projects. These grade control structures serve to

substantially reverse historic stream degradation and additionally serve to reduce sediment flowing down stream. These structures represent a significant financial enhancement to Iowa's farming operations by reducing topsoil losses and preserving prime farmland.

The Iowa DOT, cities and counties actively manage their right-of-way to assure excess property is sold off to maximize the land available to the public. Approximately 2.6 percent of the land area of Iowa is currently dedicated to rural transportation facilities. This is compared with approximately 2.5 percent in 1945. (United States Department of Agriculture, Economic Research Service, <http://www.ers.usda.gov/Data/MajorLandUses>) Over the same time period the portion of Iowa's land area used for cropland went from 70 percent to 77 percent. The impact of transportation facilities on Iowa's cropland is extremely small.

### **Safety**

Transportation safety continues to be a primary concern and an integral element in planning and programming processes. Increased transportation safety through the reduction of crashes is the foremost element in an effective and efficient transportation system.

Ten years ago, based on a five-year average, 477 Iowans died annually on our public roadway system. Today, through a concerted and coordinated approach to saving lives, the five-year average stands at 425. Partners in the effort to reduce fatalities include the Iowa DOT, cities, counties, Department of Public Safety, Governor's Traffic Safety Bureau, and Iowa Legislature. The reduction in fatalities has been accomplished due to continued improvements in roadway design and construction, enactment of Iowa's primary seatbelt law, establishment of the Traffic Safety Improvement Program to fund safety projects, enactment of the graduated driver's license, stricter operating while under the influence laws, and many other activities.

Despite Iowa's success in reducing fatalities, much more needs to be done. Over the past five years, on average, 425 Iowans have died each year in traffic crashes and many more suffered life changing injuries. A little over half of all fatalities occur on the Primary Road System, but in terms of fatal crash rate (number of fatal crashes per 100 million vehicle miles traveled) the Secondary Road System has the highest rate. Nationally, motor vehicle crashes are the leading killer of children, adolescents and young adults; the third leading cause of emergency department visits; and responsible for 50 to 60 percent of serious head and spinal cord injuries. (National Center for Health Statistics, Centers for Disease Control and Prevention, 2003) In Iowa alone, one motor vehicle crash occurs every nine minutes. In those crashes, one person will be injured every 20 minutes and one person will die every 21 hours. In 2005, motor vehicle crashes had a \$1.3 billion negative impact on Iowa's economy due to lost wages and productivity, and costs of medical and non-medical services.

In Iowa, the types of crashes causing the most fatalities and serious injuries involve a vehicle leaving the road or crossing the centerline (i.e., lane departure), and crashes at

intersections. Sixty percent of all fatal crashes in Iowa involve a lane departure. There are many reasons why lane departure crashes happen, but roadway improvements such as paved shoulders, rumble strips, lighting, flattening curves, etc., have proven to reduce the number of those types of crashes or mitigate their consequences.

More than one-third of Iowa's traffic fatalities and serious injuries occur at intersections. Over the past two decades, the percentage of intersection crashes has grown by 14 percent in Iowa's urban areas and 5 percent in rural areas. The types of roadway improvements that can reduce the number and/or severity of intersection crashes include installing larger or more visible street signs, building longer turn lanes, building offset turn lanes, and in some rural situations, building interchanges to replace at-grade intersections.

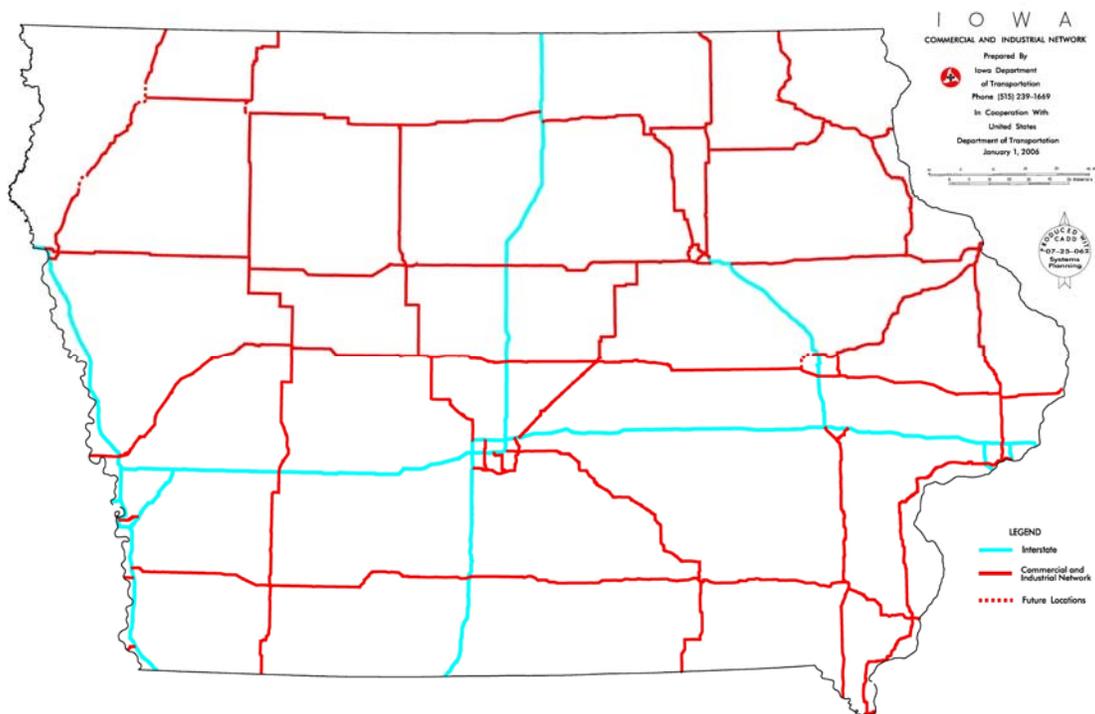
# Iowa's Public Roadway System Description

## Existing System

The public roadway system in Iowa consists of nearly 114,000 miles of highways, roads and streets and almost 25,000 bridges. Those roadways are the responsibility of the Iowa DOT, the 99 counties and 947 cities. The Iowa DOT has responsibility over the Primary Road System, which consists of the interstate system and numbered Iowa and US routes. The 9,373 mile Primary Road System consists of 782 miles of interstate highways, 2,411 miles of Commercial and Industrial Network highways, and other highways. There are 3,975 bridges on the Primary Road System.

The concept of the CIN was established by the legislature with a stated purpose to “improve the flow of commerce; to make travel more convenient, safe, and efficient; and to better connect Iowa with regional, national, and international markets.” The CIN was initially designated by the Iowa Transportation Commission in June of 1988. Figure 1 shows the interstate system in blue and CIN in red.

Figure 1 – Map of the Interstate and CIN



Source: Iowa DOT – Office of Systems Planning

Iowa's 99 counties have jurisdiction over the Secondary Road System, which includes non-primary public roadways outside of city corporate limits and Farm-to-Market Road System extensions within cities with a population less than 500, totaling 90,075 miles and 19,866 bridges. Similar in concept to the CIN, a subset of the Secondary Road System has been designated as the Farm-to-Market Road System. The Farm-to-Market Road System provides critical connections for the movement of agricultural goods and freight, and is approximately 30,500 miles. Many county roads are low-volume gravel roads, but

they are necessary to provide public access as required by Iowa law, unless the county pays damages to the property owner.

Cities have responsibility for the Municipal Street System which includes those streets within their corporate limits that are not primary roads or secondary roads. The Municipal Street System is comprised of 14,339 miles and 958 bridges.

Tables 1 through 3 provide summary information for each system. Table 1 is a breakdown of mileage, vehicle miles of travel (VMT) and large truck VMT on each system. Table 2 is a summary of mileage by average daily traffic range for each system. Table 3 is a mileage summary by pavement type.

Table 1 – Mileage and Vehicle Miles of Travel (VMT) by System

	Mileage* (as of January 1, 2006)	% of Total Mileage	2005 Total VMT (1,000,000s)	% of Total VMT	2005 Large Truck VMT (1,000,000s)	% of Total Large Truck VMT
Primary	9,372.66	8.2%	19,208	60.8%	2,491	88.3%
Secondary	90,075.12	79.2%	5,481	17.4%	286	10.1%
Municipal	14,338.75	12.6%	6,879	21.8%	45	1.6%
Total	113,786.53		31,568		2,822	

Source: Iowa DOT – Office of Transportation Data

\* This table and report do not include the small amount of mileage within Iowa’s parks and institutions.

Table 2 – 2005 Mileage by System and Average Daily Traffic \*\*

	Average Daily Traffic Range						
	0 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 and higher
Primary	3 miles	6 miles	40 miles	659 miles	5,678 miles	1,192 miles	1,316 miles
Secondary	65,816 miles	9,431 miles	6,459 miles	5,440 miles	2,852 miles	70 miles	3 miles
Municipal	926 miles	1,980 miles	4,162 miles	3,290 miles	2,597 miles	640 miles	363 miles

Source: Iowa DOT – Office of Transportation Data

\*\* Does not include ramps or roads that do not have traffic data.

Table 3 – 2005 Mileage by System and Pavement Type

	Paved	Gravel	Dirt	Total
Primary	9,373 miles	0 miles	0 miles	9,373 miles
Secondary	18,831 miles	66,573 miles	4,671 miles	90,075 miles
Municipal	12,886 miles	1,121 miles	332 miles	14,339 miles

Source: Iowa DOT – Office of Transportation Data

All three levels of government play a critical role in serving Iowa’s transportation needs. The Primary Road System directly serves 605 of Iowa’s cities. Iowa’s other 342 cities rely on the Secondary Road System to access the state system. Many residents of cities directly served by primary roads also rely on the Secondary Road System. The Primary

and Secondary Road Systems play a significant role in the movement of agricultural products to market. The Municipal Street System is vital to provide access to residents and businesses, and support the movement of goods.

It is useful to think of the public roadway system in Iowa as providing two services --- mobility and accessibility. All roads, to varying degrees, provide both mobility and accessibility. To fully experience both, Iowa's citizens rely on all road systems. Municipal and secondary roads provide more direct access to residences, farms, manufacturers, services, educational facilities, hospitals, etc., while the Primary Road System provides the mobility to connect Iowa's cities and regions with each other and the Midwest, national and international markets. It is vital that Iowa continue to have a fully supported public roadway system at all levels.

### **Funding**

Iowa's public roadway system is supported by revenue from the federal, state and local governments.

#### *Federal*

Federal revenues for public roadways in Iowa are primarily collected via a federal fuel tax. Those revenues are appropriated to each state by Congress through several programs, including Interstate Maintenance (IM), National Highway System (NHS), Surface Transportation Program (STP), Highway Bridge Replacement and Repair Program (HBRRP), Highway Safety Improvement Program (HSIP), and earmarks.

The IM and NHS funds are used by the state to fund projects for those systems, both of which are part of the Primary Road System. The remaining federal funds are allocated between the state, cities and counties through varying mechanisms.

STP funding can be used in Iowa on approximately 35,000 miles of roads under the jurisdiction of the Iowa DOT, cities and counties. Funding eligibility is based on a federal functional classification system in which only roads classified at a certain level are eligible to utilize STP funding. Nearly all of the Primary Road System is eligible for STP funding and approximately 30 percent of the Secondary Road System and Municipal Street System are eligible. Of the total STP funds for Iowa, 37.5 percent of the STP funds are allocated to the state. The remaining 62.5 percent is allocated to the cities and counties through a regional planning process. For federal funding purposes, Iowa's cities and counties participate in regional organizations to conduct long-range planning and programming of federal-aid. In Iowa, there are nine Metropolitan Planning Organizations (MPO) covering Iowa's metropolitan areas with population over 50,000. The remaining rural areas of Iowa are split into 18 Regional Planning Affiliations (RPA). These MPOs and RPAs all receive an allocation of STP funding that they program toward projects of regional significance in their area.

The HBRRP funds are allocated 47 percent to counties, 11 percent to cities and 42 percent to the state. These percentages are primarily based on each level of government's share of total bridge area that is deficient or obsolete. The portion allocated to individual

counties is by formula, while the funds allocated for cities are available by application to the Iowa DOT.

The HSIP is a new federal program created to significantly reduce traffic fatalities and serious injuries on all public roadways. Use of HSIP funds will be guided by Iowa’s Comprehensive Highway Safety Plan, currently under development, and an analysis of the top 5 percent of areas with the most severe safety needs. It is expected that most of this funding will be targeted to Primary Road System projects, with the remaining funding for the cities and counties. A subset of the HSIP program is the High Risk Rural Roads program, which provides approximately \$1 million per year to the counties through an application based program.

Earmarks are funds specifically allocated by Congress to named projects through multi-year authorization bills and annual appropriation bills.

Table 4 is an estimate of the distribution of federal-aid for FFY 2007. The miscellaneous category includes funding for small federal-aid programs, such as federal recreational trails, scenic byways, metropolitan planning, and several others.

Table 4 – Distribution of Estimated FFY 2007 Federal-Aid

Federal Program	Allocation to State	Allocation to Cities and Counties *	Total
Interstate Maintenance	\$55 million	N/A	\$55 million
National Highway System	\$82 million	N/A	\$82 million
Bridge Replacement and Rehabilitation	\$23 million	\$32 million	\$55 million
Surface Transportation Program	\$21 million	\$51 million	\$72 million
Highway Safety Improvement Program	\$11 million	\$2 million	\$13 million
Earmarks	\$4 million	\$2 million	\$6 million
Miscellaneous	\$9 million	\$14 million	\$23 million
<b>Total</b>	<b>\$205 million</b>	<b>\$101 million</b>	<b>\$306 million</b>

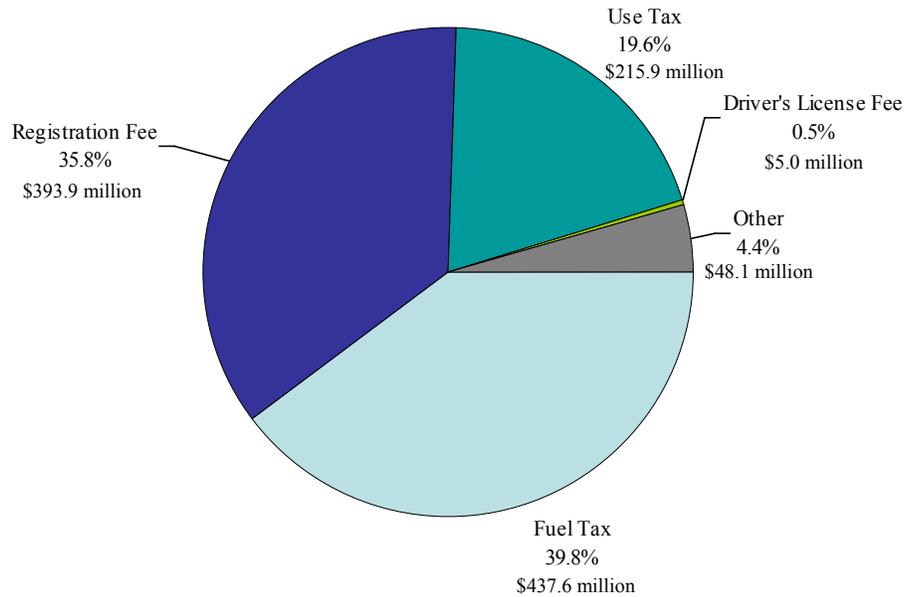
Source: Iowa DOT

\* City and county allocations have been combined in this table because actual allocations vary from year to year based on the results of federal-aid programming by the RPAs and MPOs, and the results of application-based programs.

### *State*

State revenues for public roadways come from Iowa’s Road Use Tax Fund (RUTF). The RUTF consists of revenues from fuel tax, registration fees, use tax, driver’s license fees, and other miscellaneous sources. In FY 2007 it is estimated the RUTF will receive approximately \$1.1 billion, with approximately 40 percent coming from fuel tax, 36 percent from registration fees and 20 percent from use tax (see Figure 2).

Figure 2 – Estimated FY 2007 RUTF Revenue by Source



Source: Iowa DOT – Office of Program Management

After some off-the-top allocations for programs such as Revitalize Iowa’s Sound Economy (RISE), motorcycle education, Living Roadway Trust Fund, and state park and institutional roads, the RUTF is distributed by formula to the Iowa DOT for use on the Primary Road System, to counties for use on the Secondary Road System and Farm-to-Market Road System, and cities for use on the Municipal Street System (see Table 5).

Table 5 – Distribution of Road Use Tax Fund

Jurisdiction	Formula Distribution of RUTF
State – Primary Road Fund	47.5 percent*
Counties – Secondary Road Fund	24.5 percent
Counties – Farm-to-Market Road Fund	8.0 percent
Cities - Street Construction Fund of the Cities	20.0 percent **

\* 1.75 percent of the Primary Road Fund is allocated to counties and cities as compensation for assuming jurisdiction of primary highways as a result of SF 451.

\*\* A portion of the Street Construction Fund of the Cities allocated to cities with population less than 500 is allocated to the county as compensation for assuming jurisdiction of Farm-to-Market Road System extensions within those cities.

All RUTF revenues distributed through the formula can be used for construction and maintenance activities, except for the Farm-to-Market Fund, which can only be used for construction. Primary Road Fund (PRF) revenues are used by the Iowa DOT to fund statewide improvements on the Primary Road System both outside of and within cities. The Secondary Road Fund (SRF) is distributed among Iowa’s counties for use on all secondary roads. The Farm-to-Market Road Fund (FM) is distributed among the 99 counties for construction improvements on the Farm-to-Market Road System. Both the FM and SRF are distributed to counties through a formula based on miles, traffic, area, rural population, and bridge data. The Street Construction Fund of the Cities is

distributed, based on each city's share of total statewide city population, to Iowa's 947 cities for use on the Municipal Street System.

*Local*

Cities and counties also receive funding for their roadways from local revenue sources. Typical sources include property taxes, local option sales tax, tax increment financing districts, bonding (primarily for cities), and assessments. The amount of local revenue each city and county receives varies based on local taxing decisions.

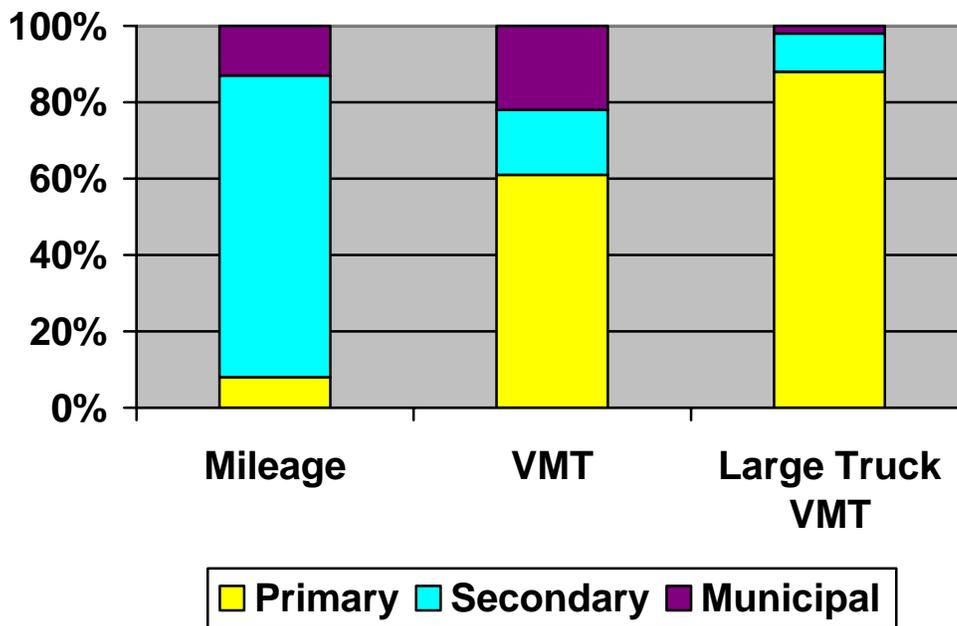
## Factors Impacting Transportation

### Increasing Travel

The number of vehicles traveling Iowa’s public roadway system has steadily increased and the trips those vehicles are taking are longer in distance. The total volume of traffic on the roadway system is measured in terms of “vehicle-miles-of-travel” (VMT). In 2005, there were 31.6 billion vehicle miles traveled on Iowa’s public road system. About 61 percent of that travel was on the Primary Road System, even though the Primary Road System is only 8 percent of Iowa’s total public roadway mileage (see Figure 3). The Secondary Road System carried 17 percent of the travel on 79 percent of the total public roadway mileage. The Municipal Street System carried 22 percent of Iowa’s travel on 13 percent of the public roadway mileage.

Figure 3 also includes the share of large truck VMT that is carried by each system. The Primary Road System carries 88 percent of all large truck VMT in Iowa. The Secondary Road System carries 10 percent of large truck VMT. The Municipal Street System carries 2 percent of large truck traffic.

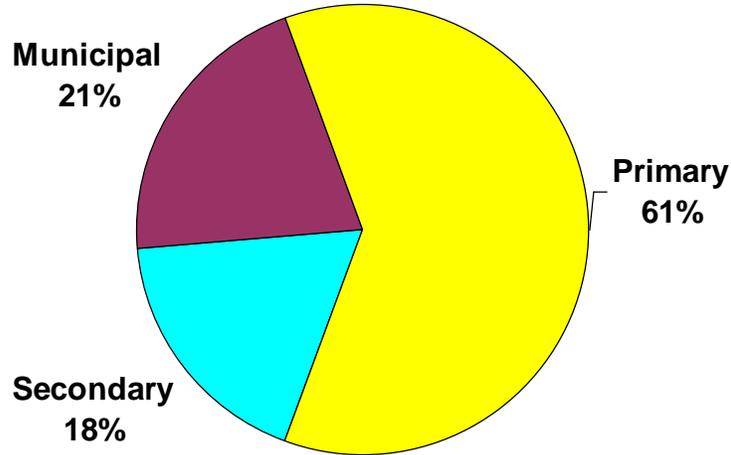
Figure 3 –Share of Mileage and VMT by Jurisdiction



Source: Iowa DOT – Office of Transportation Data

Travel across Iowa has increased by approximately 36 percent between 1990 and 2005; however, the distribution of the increased travel has been focused on the Primary Road System. Figure 4 reflects where the growth in VMT from 1990 to 2005 has occurred. Approximately 61 percent of VMT growth in Iowa has occurred on the Primary Road System with most of that growth occurring on the interstate and CIN systems. The Secondary Road System accounted for 18 percent of the growth and Municipal Street System 21 percent.

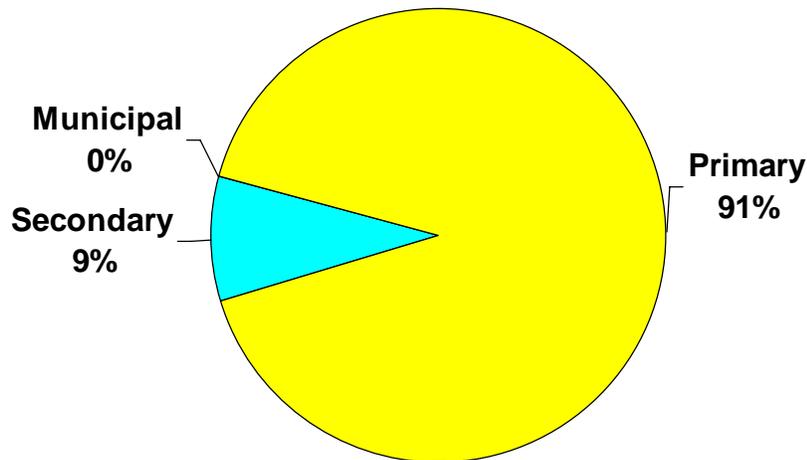
Figure 4 – Distribution of VMT Growth from 1990 to 2005



Source: Iowa DOT – Office of Transportation Data

Over the last 15 years, large truck travel has increased 51 percent in Iowa. Of all the large truck travel growth over that time period, 91 percent has occurred on the Primary Road System (see Figure 5). The Secondary Road System accounted for the remaining 9 percent of large truck travel growth. The Municipal Street System large truck travel was flat.

Figure 5 – Distribution of Large Truck Traffic Growth from 1990 to 2005



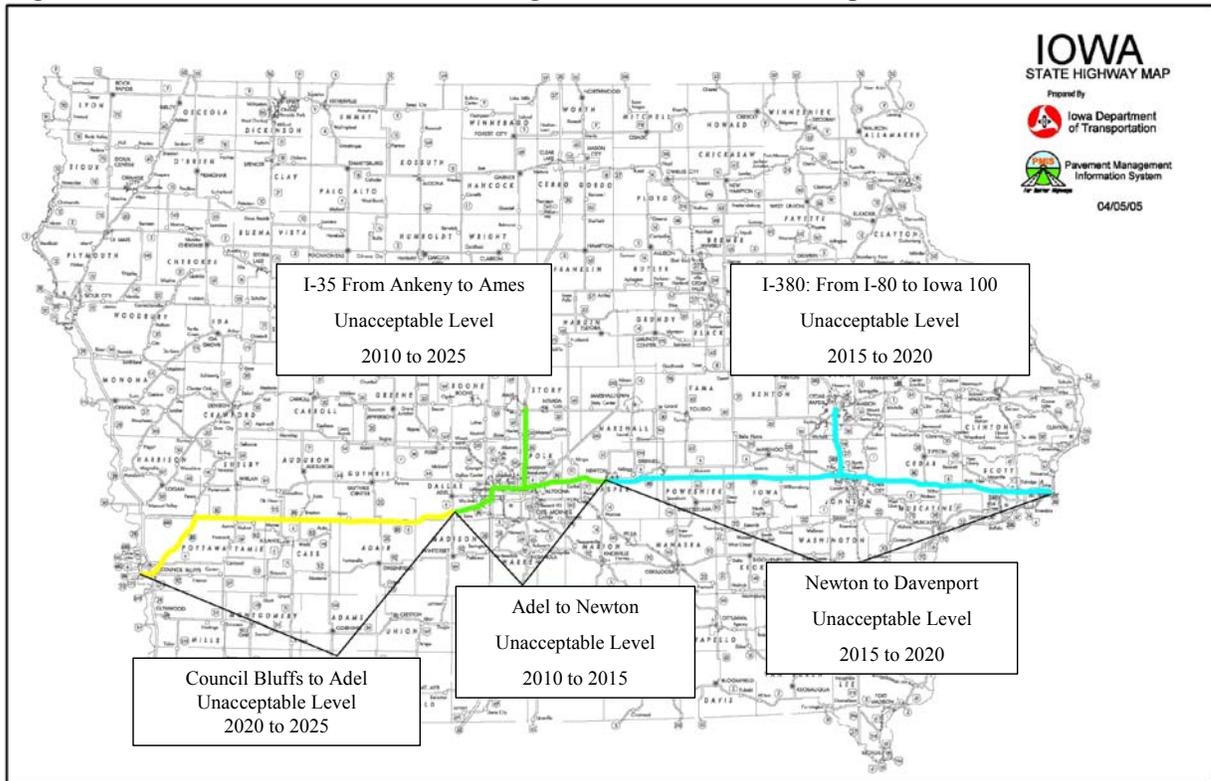
Source: Iowa DOT – Office of Transportation Data

### Increasing Freight Movements

Iowa is heavily dependent on trucks for most types of freight movements. In 2001 alone, over 350 million tons of freight traveled on Iowa's public roadway system, with a value of nearly \$390 billion. By 2020, it is projected that large truck VMT will increase by 50

percent in Iowa, resulting in worsening pavement conditions, deteriorating bridges and increased congestion on Iowa’s public roadways. As with the past 15 years, it is expected that most of the increase in large truck travel will again be concentrated on the interstate and CIN portions of the Primary Road System, resulting in disproportionate impacts on the infrastructure. Recent analysis of the interstate shows that much of the system will have an unacceptable level of service (LOS) in the next 20-years due to increasing traffic and freight volume. An unacceptable LOS means the roadway is near capacity and congestion will be a regular occurrence. Figure 6 identifies segments of the interstate and timeframe in which it is expected that the LOS will become unacceptable.

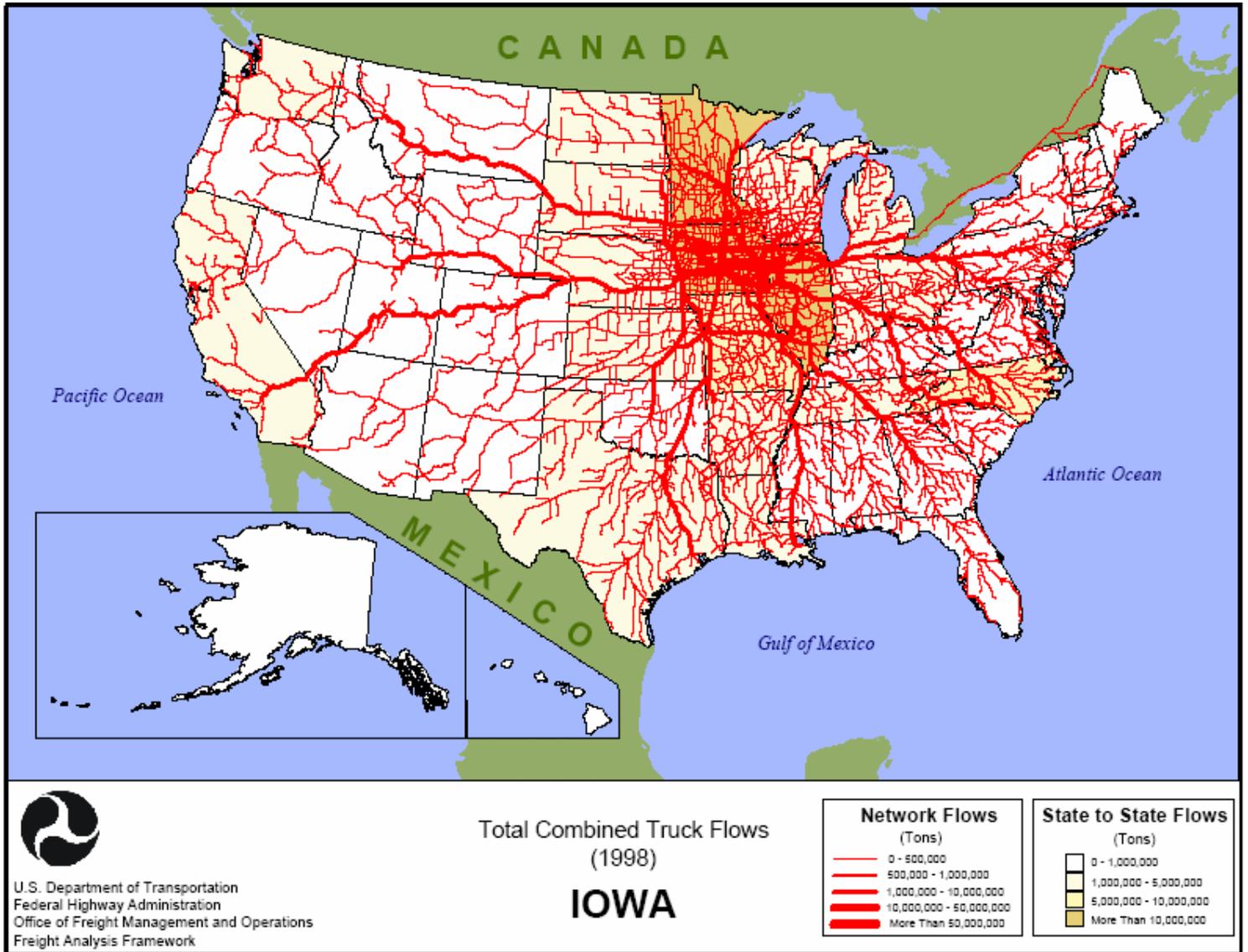
Figure 6 – Timeframe when Interstate Segments Reach an Unacceptable Level of Service



Source: Iowa DOT – Office of Design

Much of the freight that travels on Iowa's public roadway system is destined to other markets in the United States and international markets. Figure 7 is a representation of freight flows that originate and terminate in Iowa, and their origination or ultimate destination. As can be seen in the map, Iowa's public roadway system is critical for moving goods to and from the rest of the nation, thus providing opportunities to support and enhance our economy. The map does not include the freight flows that originate and terminate outside of Iowa and only pass through Iowa.

Figure 7 – Iowa Truck Flows



Source: Federal Highway Administration

To represent total freight flows traveling the nation’s highway system, Figure 8 was developed. The thickness of the line reflects the tonnage of freight on individual roadways. The vital role of the Iowa’s interstate in the movement of the nation’s freight is evident.

Figure 8 – National Truck Freight Tonnage by Route



Source: Federal Highway Administration

### **Changing Demographics**

Iowa is experiencing several demographic changes that are impacting the public roadway system, and increasing maintenance and construction needs.

#### *Aging Population*

The median age of Iowa’s population increased from 29 years in 1970 to 37 years in 2000. The U.S. Census Bureau estimates the median age of Iowa’s population will increase to 42 years by the year 2030.

According to the 2000 census, the age group of 45 and over made up over one-third of Iowa’s total population. The over-45 age group will continue to increase, especially as the first wave of baby boomers is now entering their retirement years. By the year 2030, the age group of 45 and older will grow by 37 percent, resulting in it being 44 percent of Iowa’s total population.

Iowa’s population age 65 and older was approximately 15 percent of Iowa’s total population according to the 2000 census. The population of those aged 65 and older has increased steadily since 1940. The growth rate for this age category is expected to level off in the short term. However, in the longer term, the baby-boom generation will have a significant impact on the age 65 and older category, with numbers rising to an all-time high. Another interesting trend in this age group is the “migration” of retired persons from Iowa to seasonal or second homes in other states, and permanent “migration” back to Iowa in later years for medical and family reasons.

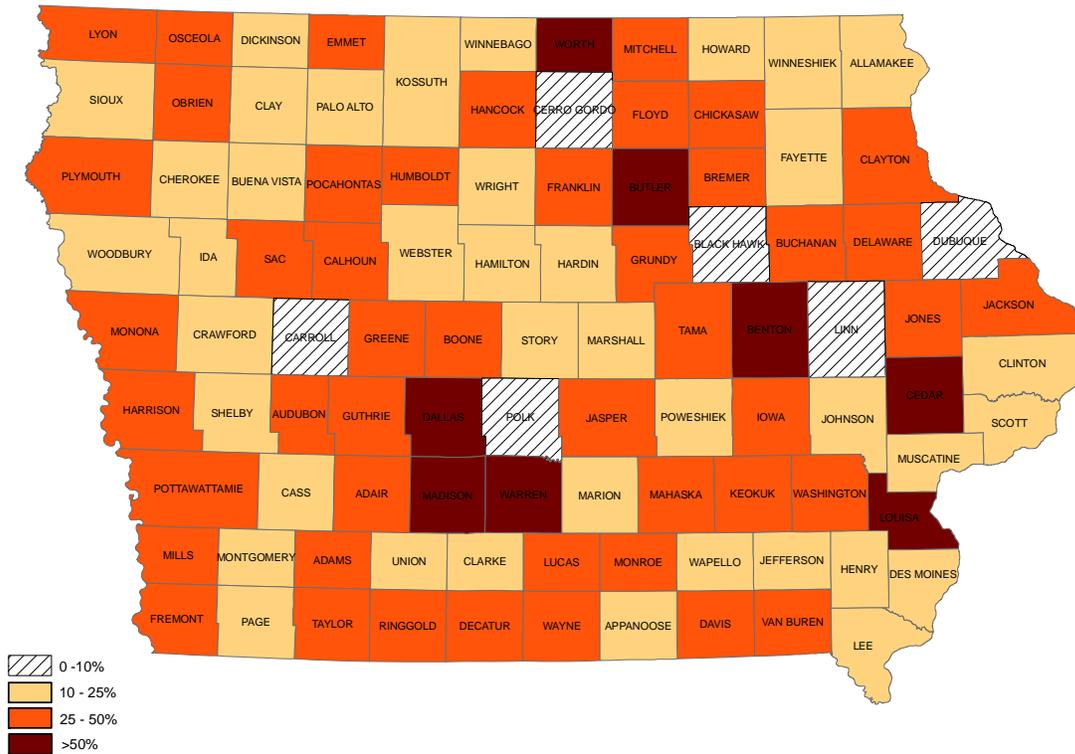
Iowa's increasingly older population has specific transportation needs that differ from other age groups. Improving the roadway and driving environment is necessary to help meet the limitations of older drivers. Currently 39 percent of all licensed drivers in Iowa are age 50 or older. Some key actions that have been identified to enhance roadway safety of older drivers are:

- larger lettering on roadway signs;
- reduced complexity and conflicts at intersections by use of signaling, turn lanes and other design features;
- more visible pavement markings; and
- enhanced roadway lighting.

*Increasing Urbanization*

Iowans continue to move to the urban and metropolitan areas of Iowa. For the first time ever, in 2003 more people lived in Iowa's nine metropolitan areas (areas with population greater than 50,000) than lived outside of those areas. This is an increase from 1970 when 40 percent of Iowans lived in metropolitan areas. By 2030, the U.S. Census Bureau estimates that 60 percent of Iowa's total population will live in metropolitan areas.

Figure 9 – Percent of Workforce Leaving County of Residence to Work in another County



Source: U.S. Census Bureau

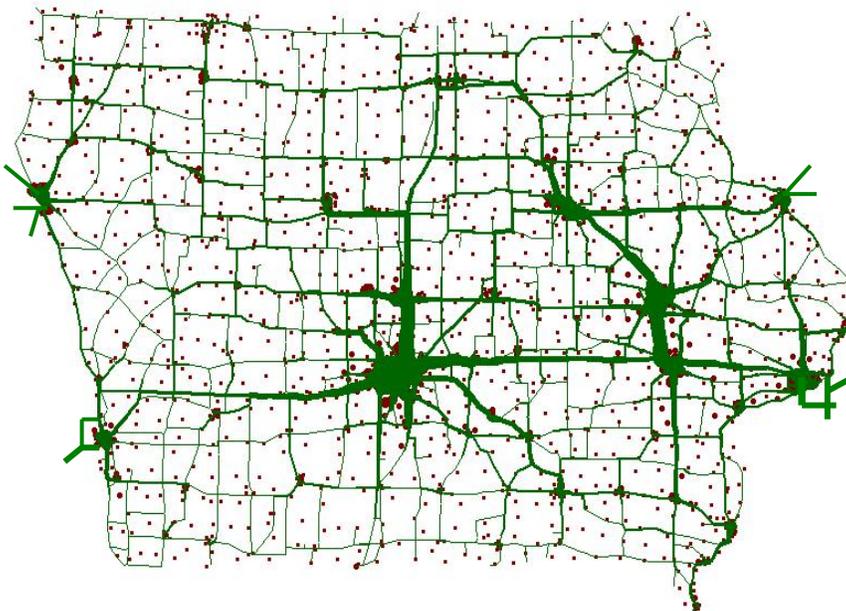
While more people are moving to metropolitan areas, the majority of the growth is in the periphery of the areas resulting in increasing demand for transportation facilities to

support commuting patterns. In addition, many people are moving into rural areas adjacent to metropolitan areas and then commuting on municipal, secondary and primary roads. A demonstration of this trend is the number of workers commuting outside their county of residence to work, as shown in Figure 9. In 1990, according to the U.S. census, 225,445 Iowans (17 percent of the workforce) commuted to work outside of their county of residence. The 2000 census showed that number increasing 33 percent to 299,448 (22 percent of the workforce).

Commuters in Iowa are not just commuting into the larger metro areas. Some are “reverse commuting” or traveling from their residence in a larger metro area to their job in a smaller metro area. For them, the quality of life benefit is the lifestyle of a larger community. Many quality of life issues are associated with living in one location and being willing to commute to another location for employment.

All of these trends are placing demands on the public roadway system, resulting in worsening conditions, congestion, and safety issues in and around our metropolitan areas. The impact is particularly acute on primary road corridors surrounding metropolitan areas. Many of these corridors are beginning to experience congestion issues during the morning and afternoon rush hours when commuting traffic is highest. The Center for Transportation Research and Education at Iowa State University recently studied commuting traffic trends and developed Figure 10, which shows the location of commuting traffic on the Primary Road System. The thickness of the lines represents the volume of commuting traffic. As can be seen on the map, primary roads around metropolitan areas are carrying high volumes of commuting traffic.

Figure 10 – Key Commuting Routes in Iowa  
(line thickness reflects relative 2004 commuting volume)

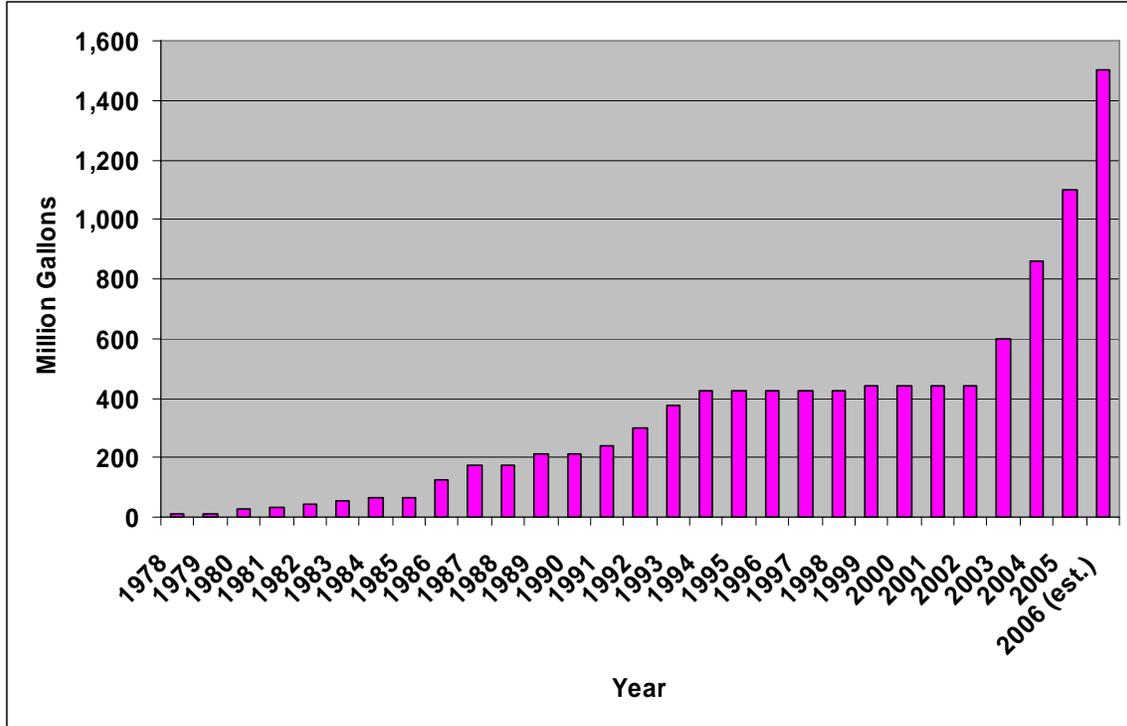


Source: Iowa State University, Center for Transportation Research and Education

### Increasing Ethanol and Biodiesel Production

Iowa is now the leading producer of ethanol in the country. Figure 11 below shows the increase in ethanol production in Iowa over time.

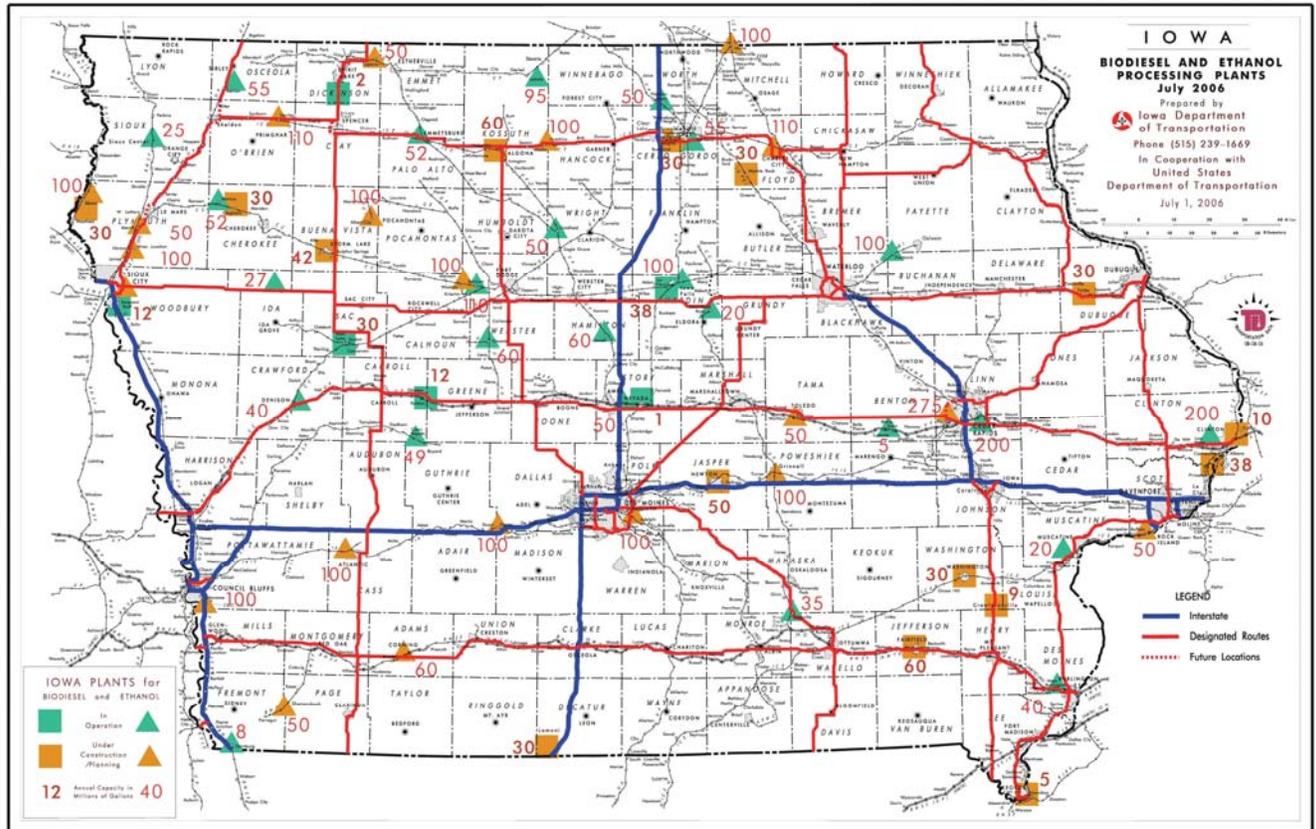
Figure 11 – Ethanol Production in Iowa



Source: Iowa Corn Promotion Board

Iowa produced approximately 1.1 billion gallons of ethanol in 2005 and is expected to produce over 1.5 billion gallons in 2006. Including the ethanol plants that are currently under construction or planned (see Figure 12), Iowa will be producing approximately 1.9 billion gallons in the near future. This huge increase in ethanol production has significant impacts on the public roadway system. Almost all of the corn used in ethanol production is trucked on the public roadway system to ethanol plants around Iowa. To ship corn just to existing and planned ethanol plants will require 1.4 million truck loads per year. While there are many ethanol plants, they are often farther away than the grain elevators that farmers previously used to ship corn. This is resulting in increased wear on the roadway system, and congestion at certain times of day, as trucks queue to enter the plants. The increased truck volume around ethanol plants is also creating safety concerns at nearby intersections, resulting in the need for intersection improvements, including the need to consider interchanges at some existing at-grade intersections on the Primary Road System.

Figure 12 – Existing and Planned Biodiesel and Ethanol Process Plants



Sources: Iowa DOT, Iowa Department of Natural Resources, U.S. Department of Agriculture, and Iowa Corn Promotion Board

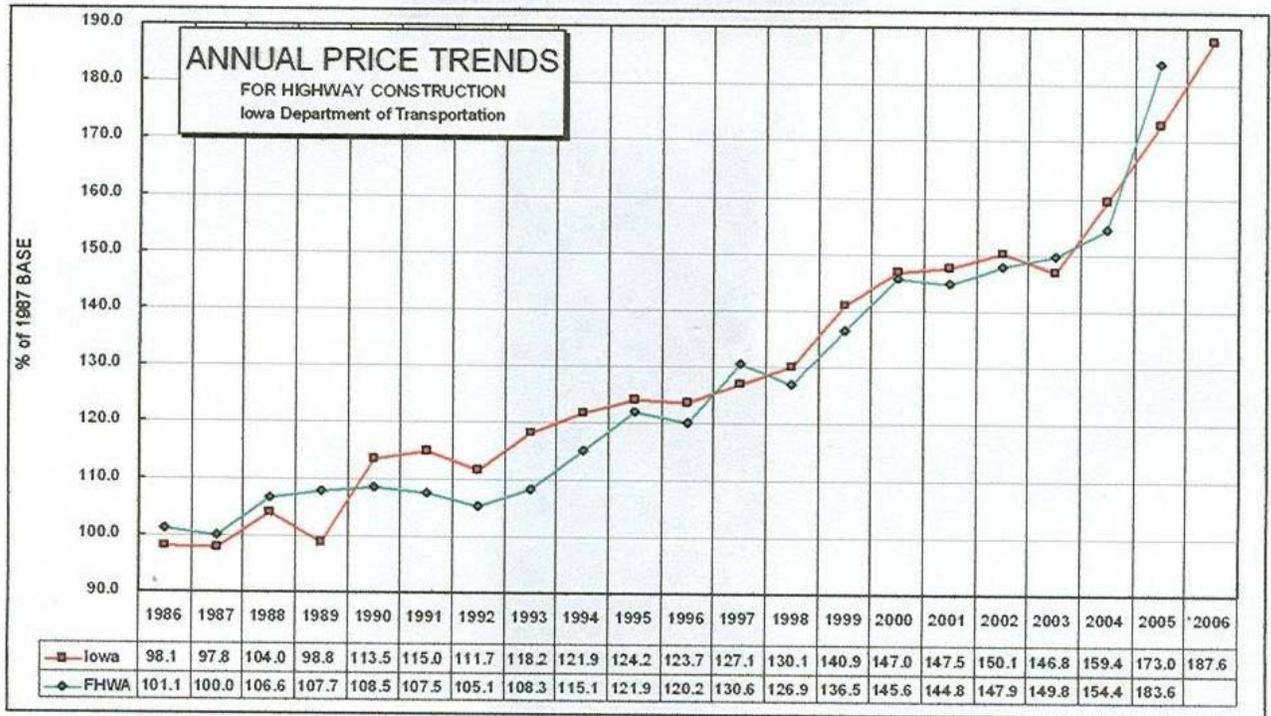
In addition to the large volume of ethanol production in Iowa, the state is also experiencing rapid growth in biodiesel production. Currently there are six plants producing 94 million gallons of biodiesel per year, but this is expected to grow to 24 plants and 625 million gallons per year based on plants under construction or planned. As with ethanol plants, biodiesel plants also generate truck traffic resulting in the same issues with increased wear on the roadway system and congestion.

### Increasing Construction/Maintenance Costs

In recent years the cost of materials used in roadway construction and maintenance has increased dramatically. This is due to rising demand for materials including cement, asphalt binder, and steel in the United States and in fast-developing countries such as China and India. The price of asphalt has also been impacted by the rising cost of crude oil and demand for other refined products, such as diesel, gasoline and heating oil. The net impact of these issues has been extremely large increases in roadway construction and maintenance costs, which have greatly reduced the buying power of the RUTF, and subsequently the amount of work that can be completed. Since 2003 the Consumer Price Index has increased approximately 9.1 percent while the corresponding roadway Construction Cost Index has increased 28.2 percent. The increase in roadway

construction prices is reflected in Figure 13, which shows the Construction Cost Index based on cost trends for excavation material, hot mix asphalt, paving concrete, reinforcing steel, structural steel, and structural concrete. The green line represents the changes in the Construction Cost Index since 1986 for the nation (as calculated by the Federal Highway Administration), while the red line represents the Construction Cost Index trend for Iowa (as calculated by the Iowa DOT – Office of Contracts) over the same time period.

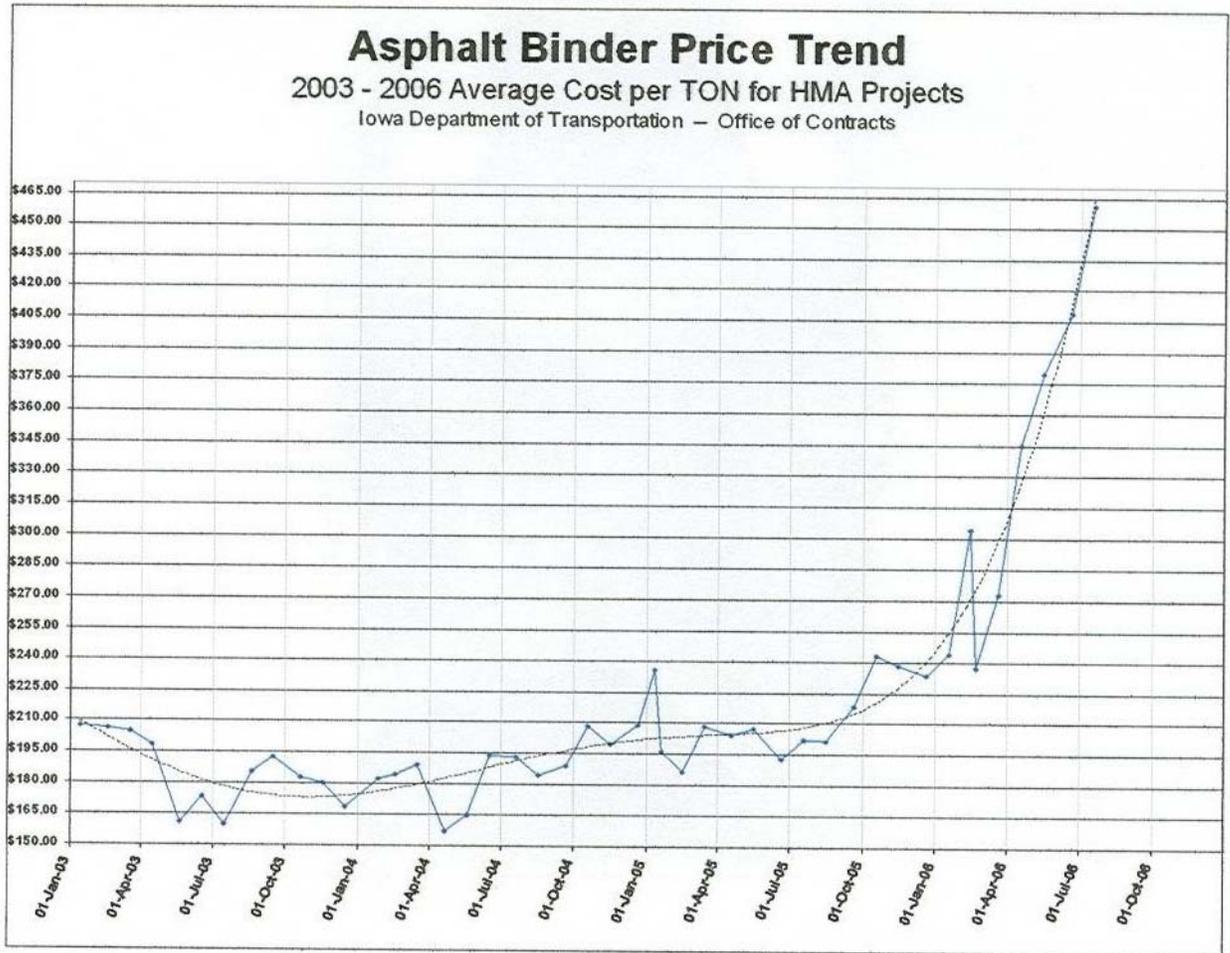
Figure 13 – Trend of Roadway Construction Prices



Source: Iowa DOT – Office of Contracts

The impact on asphalt has been even more dramatic, as shown in Figure 14. Just in the last 15 months, the price of asphalt binder has increased 250 percent.

Figure 14



Source: Iowa DOT – Office of Contracts

**Deteriorating Roadway Condition**

Pavement conditions across Iowa’s public roadway system are deteriorating. All levels of government are struggling to provide adequate maintenance and address even the most basic construction and maintenance needs to preserve the existing system. At the same time there are significant costs to address capacity and modernization needs on the interstate, bridge needs on our major river border crossings, and corridor development needs across the state.

*Pavement Condition*

On the Primary Road System, pavement conditions are typically evaluated by measuring the number of miles of pavement that are below a defined “acceptable level.” When a pavement falls below an acceptable level it is considered deficient and necessary to

consider improvements to the pavement in the near future. From 1999 to 2005, the miles of deficient pavements on the Primary Road System increased from 1,968 to 2,836, an increase of 44 percent. This means that over one-fourth of all Primary Road System pavements have a condition below an acceptable level. The 44 percent increase in deficient pavements represents an increase in Primary Road System pavement rehabilitation needs of \$366 million --- on top of all the existing needs. As needs continue to increase and improvements are delayed, the cost to recover grows dramatically.

Pavement conditions on the Secondary Road System and Municipal Street System are also deteriorating. County officials estimate that approximately 1,000 miles of paved roads need to be resurfaced each year just to maintain current conditions. Following are some examples from cities and counties in Iowa that are typical of all city and county governments across the state.

- The city of Des Moines has projected, based on past trends and existing funding levels, a 20 percent drop in average pavement condition in the next 10 years.
- The city of West Des Moines has projected a 15 percent drop in pavement condition in the next eight years.
- In 2004, Muscatine County determined that, with existing funding levels, their pavement condition will deteriorate by 8 percent in 5 years.
- Dallas County pavement condition deteriorated by almost 5 percent between 2001 and 2005.

#### *Bridge Condition*

Bridge condition is often evaluated by monitoring the number of bridges that are structurally deficient or functionally obsolete. A structurally deficient bridge has an existing structural condition(s) that requires monitoring and corrective action. A functionally obsolete bridge has clearance or geometric deficiencies that should be improved. Statewide there are 24,799 bridges on Iowa's public roadways. Of those, 3,975 are on the Primary Road System, 958 are on the Municipal Street System and 19,866 are on the Secondary Road System.

On the Primary Road System the number of structurally deficient bridges has increased during the 1999 to 2005 time period from 171 to 256, an increase of 50 percent. Approximately 6 percent of bridges on the Primary Road System are structurally deficient. During the 1999 to 2005 time period, the number of functionally obsolete bridges dropped from 331 to 303 primarily due to bridges that were functionally obsolete in 1999, which as a result of deteriorating conditions, moved to the structurally deficient category by 2005. The 50 percent increase in structurally deficient structures results in an additional \$136 million in bridge rehabilitation and reconstruction needs to the existing bridge needs on the Primary Road System.

There are 4,612 structurally deficient and 1,332 functionally obsolete bridges on the Secondary Road System. The Secondary Road System has by far the most bridges so it

has the most structurally deficient and functionally obsolete bridges of the three jurisdictions. Of the total number of structurally deficient bridges in Iowa, 90 percent are on the Secondary Road System. Of the total number of bridges on the Secondary Road System, 23 percent are structurally deficient. County officials estimate that approximately 350 bridges per year need to be replaced to maintain current conditions.

Of the cities' 958 bridges, 252 are structurally deficient and 122 are functionally obsolete. Approximately 26 percent of all Municipal Street System bridges are structurally deficient.

The number of structurally deficient and functionally obsolete bridges has not increased over time on the Secondary Road System and Municipal Street System, but little progress has been made to reduce the number of bridge needs that exist. While the number of deficient bridges has not increased, cities and counties are being forced to reduce load ratings on bridges and, in some cases, close bridges. At current revenue levels, the number of deficient bridges will start increasing in the near future.

### **Funding Issues**

As described earlier, there are three major funding sources for public roadway improvements: federal revenue; state revenue; and local revenue. All three funding sources are facing issues that will impact the Iowa DOT's, cities', and counties' ability to adequately maintain and improve the public roadway system.

#### *Federal*

Federal funding is generally restricted to construction improvements and is not available to support maintenance activities. Historically, federal funding for public roadways has increased over time. However, with the most recent federal surface transportation authorization bill titled "Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users" (SAFETEA-LU) and subsequent annual appropriation bills, the amount of available federal funding for core programs has leveled off. This is due to several issues.

- Annual appropriation bills include an adjustment called an 'obligation limitation,' which limits the amount that can actually be 'spent' each year. The obligation limitations in the annual appropriation bills (since SAFETEA-LU was adopted) have been much lower than historic levels.
- SAFETEA-LU impacts how much federal funding is allocated to each state. Historically, Iowa received more federal funding than it contributed in federal fuel taxes. With SAFETEA-LU, Iowa began to get back less funding than the state contributed through federal fuel taxes. In fact, in FFY 2007 Iowa falls to the minimum level of return on contributions allowed by law. That means Iowa will be getting back 91.5 percent of the funding Iowans contribute to the Highway Trust Fund through federal fuel taxes.
- The high number of earmarks included in SAFETEA-LU and subsequent appropriation bills impacts the Iowa DOT's, cities' and counties' ability to program funds efficiently for their core systems. Sometimes earmarks are

provided that cover only a small portion of the total project cost. This requires the Iowa DOT, city and county governments to come up with the remaining, and sometimes significant, funds for the project. In addition, earmarks can result in programming challenges for governments as they try to do the projects they deem the highest transportation priorities, yet maximize the use of funds earmarked for other projects on their system.

All of these issues have resulted in a reduction in the amount of federal funding available to the state, cities and counties for programmed construction needs. A looming issue is the source of federal highway funding, the Highway Trust Fund, is projected to have a negative balance around 2009 (at existing funding levels), which would result in a significant reduction in federal highway funding.

*State*

Iowa’s RUTF has historically been able to keep up with inflation due to increased traffic on the system and number of vehicles purchased, which lead to increased revenue from fuel taxes, use taxes and vehicle registration fees. However, as shown in Table 6, in recent years the rate of growth of the RUTF has decreased and the purchasing power has dropped significantly. The impact of inflation has resulted in a decrease in purchasing power of RUTF revenues for seven of the last nine years, but the decrease has been especially dramatic the last three years. This is due in large part to the static fuel tax rates.

Table 6 – RUTF Revenue Growth

Year	RUTF Revenue Actual Receipts (Millions)	Percent Change from Previous Year	RUTF Revenue Adjusted to Constant 1997 Dollars Based on Iowa Construction Cost Index (Millions)	Percent Change from Previous Year
1997	\$927	3.7%	\$927	0.9%
1998	\$947	2.2%	\$925	-0.2%
1999	\$1,014	7.1%	\$914	-1.1%
2000	\$1,048	3.4%	\$906	-0.9%
2001	\$1,046	-0.2%	\$901	-0.6%
2002	\$1,082	3.4%	\$916	1.7%
2003	\$1,103	2.0%	\$955	4.3%
2004	\$1,127	2.1%	\$898	-5.9%
2005	\$1,132	0.5%	\$832	-7.4%
2006	\$1,147	1.3%	\$777	-6.6%

Source: Iowa DOT – Office of Program Management

The last significant increase in fuel tax rates occurred in 1989. In recent years there have been minor adjustments to the gasoline tax rate based on gasohol consumption, but, practically speaking, the rates are unchanged. Table 7 shows the tax rates on fuel in 1989, the tax rates today, and tax rates if they had kept pace with the Consumer Price Index (CPI) and the Construction Cost Index (CCI).

Table 7 – Iowa Fuel Tax Rates

Year	Gasoline	Gasohol	Diesel
1989	20 cents per gallon	19 cents per gallon	22.5 cents per gallon
2006	21.0 cents per gallon	19 cents per gallon	22.5 cents per gallon
2006 (if tax rate kept up with CPI)	32.4 cents per gallon	30.7 cents per gallon	36.4 cents per gallon
2006 (if tax rate kept up with CCI)	38.0 cents per gallon	36.1 cents per gallon	42.7 cents per gallon

*Local*

Local revenues for municipal street and secondary road projects have been negatively impacted in recent years. Due to state regulatory restrictions, cities and counties have stated that they have been unable to generate adequate property tax to address their existing road maintenance and construction needs.

County revenues have also been impacted due to recent agricultural land devaluation that has reduced property tax revenues. Property value “roll backs” reduce the income potential available through local property taxation and further erode local income resources.

Many local jurisdictions have imposed additional taxation on themselves in the form of local option sales taxes (LOST). These LOST revenues are often directed to support road and bridge maintenance/construction activities; however, this resource has essentially been utilized to its maximum potential due to legal restrictions.

Cities rely heavily on RUTF revenue and, to a lesser extent, on federal funds for Municipal Street System needs. As these funds have failed to meet the needs of the system, cities have become more dependent on local funding sources. These include General Fund property taxes, LOST revenue and general obligation bonds. However, as cities struggle to meet all basic service needs, local funding is inadequate to address roadway system needs. The balancing of local budgets has forced city street departments to reduce their labor forces, defer maintenance and cancel major reconstruction programs.

**Actions Taken To Increase Efficiency and Reduce Administrative Costs**

*Iowa DOT Efforts*

From FY 1996 through FY 2007, the Iowa DOT has reduced full-time positions by 555. This represents a 14 percent decrease in full-time positions. Specifically from 2000 to 2003, the Iowa DOT completed an initiative to restructure the agency. This effort involved a reorganization of the divisions, a transfer of responsibilities to the district offices, a reduction in force, the consolidation of facilities, and other actions.

Through attrition, early retirement, personnel changes, and layoffs, the Iowa DOT reduced the workforce by approximately 11 percent through this effort alone. At the same time, the Iowa DOT was able to reduce the number of resident construction offices from 20 to 13, resident maintenance offices from 22 to 17, and maintenance garages from 140 to 113. The Iowa DOT was able to make these changes by reducing management

layers, consolidating functions of field workers and refocusing on services that are most important to the public.

The benefits of these changes included the following.

- Increased funding for construction: Elimination of full-time positions resulted in a significant reduction of salary and benefits costs, which leaves more money for road construction projects.
- Revenue generation: Disposal of state-owned equipment and facilities generated a one-time windfall of revenue into the state's Primary Road Fund and Materials and Equipment Revolving Fund, and reduced on-going equipment and facilities operational and maintenance costs.
- Faster response time: Fewer management layers helped reduce the time it takes for approvals, and to respond to public inquiries and concerns.
- More efficient services: Field personnel formerly assigned to either construction or maintenance activities now serve both functions, providing more effective year-round utilization of staff resources.
- Energy savings: By closing facilities, the state reduced its energy consumption, which has both a long-term financial and environmental effect.

These changes combined to reduce the Iowa DOT's operational costs by \$35 million annually making that funding available for road construction.

#### *City/County Efforts*

Cities and counties across Iowa report similar efforts to increase efficiency and reduce administrative costs. One primary example is the sharing of county engineers. To minimize administration costs, Section 309.19 of the Code of Iowa permits boards of supervisors of two or more adjacent counties to enter into an agreement to share the services of a county engineer. The following counties currently utilize this provision to share the use of a county engineer.

- Worth and Mitchell
- Floyd and Chickasaw
- Butler and Bremer
- Tama and Poweshiek
- Audubon and Shelby
- Adams and Taylor
- Calhoun and Sac

Iowa's counties have reduced staff, while at the same time assuming jurisdiction of additional miles of primary roads and municipal streets as a result of recent legislation described in the following section. Since 1998, county secondary road departments have reduced staff by 3.5 percent. (Iowa County Engineers Association Service Bureau)

In addition, secondary roads with very little traffic continue to be vacated and rural subdivision roads have been added to the Secondary Road System.

### *Cooperative Efforts*

An ad hoc group of officials representing the Iowa DOT, cities and counties, began meeting in 2002 with a goal of studying the public roadway system and identifying actions to increase efficiency of operations. The group met throughout 2002 and made recommendations. Those recommendations were the basis of legislation drafted by the Iowa DOT and subsequently adopted by the legislature in 2003, to accomplish the following:

- **Rationalize the Primary Road System by transferring 712 miles to county and city governments.**

Seven hundred and twelve miles of primary roads were identified that were more appropriately under city and county jurisdiction. Some of these roads had been bypassed by new road construction and generally served local traffic. Other roads were remnants of an old jurisdictional assignment system that resulted in primary jurisdiction of some roads that generally serve local traffic. Effective July 1, 2003, jurisdiction of these roads was transferred to cities and counties where they are improved and maintained by the appropriate jurisdiction in a more efficient manner.

The legislation included a mechanism to compensate those jurisdictions that assumed responsibility of the transferred roads. A 1.75 percent off-the-top of the Iowa DOT's formula share of the RUTF revenue (Primary Road Fund) was set-aside in a Transfer of Jurisdiction Fund. Seventy-five percent of the Transfer of Jurisdiction Fund is allocated annually for 10 years to those cities and counties that assumed jurisdiction of primary roads and is distributed based on each jurisdiction's share of construction needs on the transferred roads. Twenty-two and one-half percent of the fund is allocated to the Secondary Road Fund for distribution to all counties. The remaining 2.5 percent is allocated to the Street Construction Fund of the Cities for distribution to all cities. After 10 years, the Transfer of Jurisdiction Fund is allocated 90 percent to the Secondary Road Fund for distribution to all counties and 10 percent to the Street Construction Fund of the Cities for distribution to all cities.

- **Transfer responsibility for farm-to-market extensions in cities under 500 population to the county.**

Cities with a population under 500 generally do not have the staff and infrastructure necessary to efficiently improve and maintain their farm-to-market extensions. These extensions are often the major routes through town that carry higher levels of traffic, including significant movements of agricultural products. In many counties, the county already provided support for the city on these routes, either informally or through a formal 28E agreement. Legislation was adopted in 2003 to require counties to assume responsibility for these farm-to-market extensions in cities under 500 population. This resulted in approximately 363 miles of municipal streets becoming the responsibility of the respective counties. To allow time to plan

and gear up for this additional responsibility, this transition became effective July 1, 2004.

Along with the transfer of responsibility, a share of the city's allocation of the Street Construction Fund of the Cities was allocated to the county to compensate for the change in jurisdiction. The amount of funding to be transferred to each county was based on the portion of the city's total street mileage that is a farm-to-market extension. For example, if a city has a total five miles of streets and one mile of those streets is a farm-to-market extension, then 20 percent of the city's funding from the Street Construction Fund of the Cities is transferred to that county.

- **Allow the board of supervisors to initiate a change in county road classification to area service 'C'.**

The area service 'C' classification may be used to restrict access and provide a minimal level of maintenance on secondary roads that have little to no traffic. This classification has been used effectively by many counties to reduce maintenance and improvement needs. Prior to July 1, 2003, a county could classify a road as area service 'C' only upon petition signed by all landowners adjoining the road. Legislation was adopted in 2003 to allow a county to initiate an area service 'C' classification without the petition of all adjoining landowners. This allows counties to proactively reduce maintenance and improvement needs on roads that no longer provide a service to the county.

- **Establish a study committee to evaluate the distribution of the Street Construction Fund of the Cities.**

The Street Construction Fund of the Cities is currently distributed based on population. This does not take into consideration many factors that may impact the funding needs of Iowa's cities, such as traffic, condition, age, number and size of bridges, etc. Previous studies have documented the need to reevaluate the distribution of the Street Construction Fund of the Cities. The legislation adopted in 2003 established a study committee to evaluate alternative distribution methodologies of the Street Construction Fund of the Cities and make recommendations to the legislature by January 1, 2004. The committee met throughout 2003 and ultimately concluded that the per-capita distribution of Street Construction Fund of the Cities is the best option for distributing funding and should continue as it does today.

### **Examples of Transportation Issues in Other States**

The factors impacting transportation are not unique to Iowa. All of the states are facing transportation funding issues and considering actions to address those issues. Following is a sample of what's happening in other states.

- Colorado: Colorado DOT identified a shortfall of funding of \$15 billion in immediate needs on the state system alone. The 25-year, long-term gap between needs and projected revenue could total \$30 to \$50 billion. Reasons cited for the

shortfall in funding include construction cost inflation and declining fuel tax revenues.

- Idaho: The Idaho DOT completed a study that determined their transportation needs in the next 30 years are in excess of \$20 billion. The funding shortfall with existing revenue is over \$200 million per year. In 2006, legislation was passed to fund \$1.2 billion of improvements to begin addressing the shortfall.
- Louisiana: Due to rising construction costs and deteriorating roadway conditions, the state of Louisiana has estimated a backlog of needs of \$13 billion. The governor is proposing \$400 million in new state funding for roads.
- Massachusetts: A legislatively created Transportation Finance Committee has proposed a 9 cent increase in the state gas tax and reinstatement of toll roads in western Massachusetts to fund transportation improvements throughout the state. Funding shortfalls are due to federal funding cuts and construction cost increases.
- Minnesota: A constitutional amendment has been proposed to force the state to spend more money on transportation. The shortfall of funding is due to cost increases and lack of a gas tax increase since 1989.
- Nevada: The state is expecting significant shortfalls in funding. A state task force studying the issue said that demands on their highway system are increasing and threaten to bankrupt the state's road building and maintenance budget. They are considering recommending increases in fuel tax, vehicle fees, levies, developer impact fees, and other mechanisms to reduce the shortfall.
- North Carolina: The state is facing a shortfall of \$30 billion in transportation funding over the next 25 years. The shortfall is due to flat federal revenues, construction cost inflation, and increasing needs.
- South Carolina: The South Carolina DOT Executive Director declared the agency was in a "transportation funding crisis" and requested their annual funding be increased significantly over the coming decade. The funding shortfall is due to flat revenues, rising construction costs and the lack of a gas tax increase since 1987.
- Tennessee: Tennessee DOT officials have estimated that they need \$2 billion in additional revenue over the next ten years to meet needs on their roads. They are considering raising the gas tax along with other long-term options such as tolling and public-private partnerships.
- Virginia: In January of 2006, the governor of Virginia proposed higher fees to generate an additional \$1 billion a year to begin to address the roadway needs in the state. Those needs are estimated to be \$17 billion in northern Virginia alone.
- Wisconsin: A Wisconsin legislative panel recommended in 2006 that transportation spending be increased by 40 percent to cover longtime funding shortages. This represents a need to increase funding by nearly \$700 million annually. The major reason cited for the shortfall is construction cost inflation, which has eroded the purchasing power of their highway construction budget.
- Wyoming: Wyoming DOT has had to postpone and cut projects from its program due to reduced federal funding and construction cost increases. The Wyoming DOT asked the legislature for an additional \$105 million for the 2006 highway program and received \$75 million.

## Public Input

Early in the development of this study, the Iowa DOT, city and county officials determined it was necessary to hear from groups and associations that have an interest in the public roadway system. Over several meetings, representatives of these groups shared their thoughts on the transportation system in Iowa. Following are some of the key points expressed by those groups. Appendix A of this study includes a list of the representatives that attended the meetings.

- Highway Associations
  - Southwest Iowa Coalition (U.S. 34)
    - Bridges across the Missouri River south of Council Bluffs are in poor shape and need to be replaced.
    - This is a major economic development project for the area.
    - Improvements to those bridges will be very significant to economic development.
  - U.S. 169 Corridor
    - The corridor from Fort Dodge to Humboldt is in poor condition and has geometric deficiencies that are causing safety issues.
    - There have been eight fatalities in the last 10 years.
  - U.S. 20 Association
    - This project has been on-going since the 1960s.
    - There are 90 miles remaining that will cost approximately \$520 million.
    - Northwest Iowa has poor rail access and four-lane road access, which greatly restricts ability to move goods in and out, and has restricted economic development of the entire region.
    - Highway funding needs to be increased to invest in Iowa since transportation is the engine that drives the economy.
  - U.S. 63 Corridor
    - Improvements to U.S. 63 in northeast Iowa were committed back in the 1970s, but there is still a 16-mile gap.
    - Investments in highways provide a good return on investment and support economic development.
    - U.S. 63 from Bloomfield to Ottumwa was in the transportation improvement program, but was removed due to lack of funding. This project is not only key to the region's economic development, it is a safety issue.
  - U.S. 30 Coalition
    - U.S. 30 Tama/Toledo bypass was in the transportation improvement program, but was removed due to lack of funding. This caused hardship to the city as they invested in utility infrastructure in anticipation of the project.
    - Needed U.S. 30 improvements from Ames to Clinton would cost approximately \$400 million.
    - Improvements are also needed in western Iowa.

- Sixty percent of Iowa's population is within 20 miles of U.S. 30, so improvements to the corridor are needed to support that population.
    - The corridor is also important as a reliever to I-80.
  - Iowa 44 Association
    - This is a commuter corridor from Panora to the Des Moines metropolitan area.
    - The issue is safety and need to coordinate land use to preserve the corridor and its ability to handle the expected traffic growth.
- Iowa State Association of Counties/Iowa County Engineers Association
  - The RUTF is critical to all three levels of government.
  - The RUTF revenues are dropping when considering inflation.
  - More cities are being served by only county roads and there are more dirt roads in Iowa now.
  - Vehicle miles of travel have tripled since the 1960s, but the system size has remained almost the same.
  - County roads are critical to move goods/people, access land and serve the changing agricultural economy with the increase in ethanol plants.
  - Rural two-lane county roads have a higher crash rate than the state average.
  - Twenty-five percent of county bridges have a condition rating less than 50 (out of 100) and 380 bridges per year are due for improvement, assuming an average life of 50 years.
  - Costs that used to be covered out of general basic funds are now being paid out of the Secondary Road Fund. Liability and vehicle insurance for highway department vehicles is an example. This is reducing funding available for road improvements.
- American Public Works Association
  - The RUTF revenue is generally used for maintenance work only.
  - Additional funding is needed to address deferred maintenance.
  - There's not enough revenue to address new construction and reconstruction, therefore cities have had to rely on bonding.
  - Road conditions in cities are deteriorating.
  - If there is additional RUTF revenue it should be distributed directly to the local governments.
- Iowa League of Cities
  - Roll backs of property taxes are negatively impacting city governments across the state.
  - The negative impacts are felt not just by the transportation side of city government, but all areas of city government.
- Iowa Association of Regional Councils
  - Local governments are struggling just to maintain the system, much less to deal with new construction needs.
  - Federal funding is decreasing and earmarks bring challenges.

- The federal government cannot be expected to come through with additional funding; therefore, need to look locally and at the state level to address funding shortfalls.
- Iowa Farm Bureau Federation
  - The Farm-to-Market and Secondary Road Systems are very important to Iowa's farmers to move their products to/from the fields.
  - They are concerned about any changes to the existing RUTF formula that would create 'winners' and 'losers.'
  - The maintenance of our Farm-to-Market roads is critical to the revitalization of Iowa's rural economy, especially for the renewable fuels industry.
- Iowa Motor Truck Association
  - At the national level, congestion and increasing freight volumes are serious issues.
  - Truck size and weight will need to be discussed, as well as truck driver shortages and infrastructure needs.
  - If revenues are increased, the funding should be targeted to infrastructure needs that are most critical to the movement of freight.
  - IMTA members expect that an appropriate share of RUTF revenues go back into these routes that they are driving, which generated the revenue from fuel taxes.
  - If fuel tax increases are considered, the industry would ask for an appropriate phase in period to accommodate the new rate.
- Association of Business and Industry
  - High-quality, accessible and affordable transportation services are critically important to the ongoing economic growth of Iowa and enhancement of Iowa's quality of life
  - User fees and taxes assessed for one mode of transportation should not be used nor diverted to another mode of transportation, or diverted for non-transportation purposes.
  - ABI supports final design and corridor route decisions, including those requiring environmental policy decisions, be made by the Iowa Department of Transportation. ABI opposes environmental policy standards that add exorbitant costs to transportation infrastructure improvements.
- Iowa Chamber Alliance
  - The RUTF distribution formula should be re-evaluated, as should all formulas every 10 years or so.
  - The transportation system is becoming increasingly important due to just-in-time delivery of goods.
  - The last fuel tax increase included the creation of the CIN and targeted funding to that system.
  - Improvements to the primary system result in a big improvement to Iowa's economic development; however, need to get people and goods to the primary system so can't ignore the city and county systems.

- Iowa has done a good job in the past in supporting the city, county and state systems without creating ‘roads to nowhere.’
- Need to maintain existing system, but more money needs to go to the primary system to support the economy.
- Need to complete primary corridors with more certainty. If a project is in the five-year transportation improvement program it should be able to be built in that timeframe.
- Professional Developers of Iowa
  - Good highway infrastructure is critical to Iowa’s future in a competitive national and global economy.
  - By truck, Iowa is within 8 hours of 35 million people and \$900 million in disposable income. The interstate is vital to these truck movements.
  - Need to preserve existing infrastructure at all levels to support urban and rural development.

## **Evaluation of Future Needs**

For the purposes of this report, the Iowa DOT estimated the 20-year needs of the public roadway system in Iowa, covering the period from 2005 through 2024. To provide a full estimate of needs requires an evaluation of the administration costs, maintenance costs and construction costs for all public roadways.

### **Inflation**

The needs estimates are shown in future year dollars meaning costs have been inflated using historic construction cost growth. Should the recent trends in extremely high construction cost growth continue, the needs estimates in this report will be low.

### **Administration Needs**

Administrative costs include all expenses incurred by an agency related to roadway management, which are not directly assignable to specific construction, engineering and maintenance operations. Examples of administrative costs include salaries, equipment, insurance, facilities, etc. In addition to the standard highway administrative costs that cities and counties incur, the Iowa DOT also has administrative costs associated with motor vehicle enforcement, driver's licensing, modal programs, and other non-highway construction or maintenance related activities. These non-highway administrative costs have not been separated out of the Iowa DOT's administrative cost figures since they, too, are funded with RUTF and Primary Road Fund revenues. This results in the Iowa DOT's administration cost figures including non-highway costs.

Many cities in Iowa have used bonding to support their street improvement needs. The debt service associated with current bonding and future bonding is an administrative cost and has been included as such in this report.

To estimate future administrative needs, recent administrative cost history was evaluated for the Iowa DOT, cities and counties, and forecast for 20 years using trend analysis.

### **Maintenance Needs**

Maintenance needs include costs associated with maintaining pavements and bridges. Typical maintenance activities include snow clearing, crack-sealing, grading, pavement patching, bridge painting, guardrail repair, and many other comparable activities.

The estimate of future maintenance costs was developed by evaluating recent trends in maintenance expenditures among all jurisdictions and forecasting those trends into the future. Current maintenance expenditures at the Iowa DOT, cities and counties have not been able to adequately meet increasing maintenance needs with recent spending levels. Because the projection is based on recent historic spending levels, the maintenance needs estimate does not represent an ideal or preferred level of maintenance, and is smaller than the true needs that exist to provide a high level of maintenance on our public roadway system.

### **Combined Administrative and Maintenance Needs**

The Iowa DOT, cities and counties track their administrative and maintenance costs in different manners. This results in some costs being considered as administrative by one jurisdiction, while other jurisdictions consider those same costs as maintenance. To provide consistent comparisons from one jurisdiction to another, administration and maintenance needs are shown combined in this report. The only inconsistency for comparison purposes is the one detailed above related to the Iowa DOT's costs including considerable non-highway system administrative costs because those costs are funded from the RUTF and Primary Road Fund. This means the combined administrative and maintenance costs cannot be compared across the three jurisdictions as though they are only costs related to administering the roadway system.

### **Construction Needs**

The Iowa DOT has an extensive database of all public roadways in Iowa. This database includes data on condition, geometry, traffic, safety, and many other items. This database was used as an input into needs models developed by the Federal Highway Administration to estimate future road and bridge construction needs.

These models evaluate existing conditions and then forecast future conditions based on increasing traffic, aging pavements and bridges, and other factors. The models then identify existing and/or future deficiencies in the system and identify construction activities required to correct the deficiencies. For example, if a roadway in 10 years experiences traffic growth that results in congestion, the model will identify a need to add lanes to correct the congestion deficiency. Deficiencies can occur due to geometry of the road (e.g., narrow lanes, no shoulders, tight curves, etc.), condition of the road (e.g., poor pavement condition, poor drainage, lack of hard surfacing, etc.) or traffic congestion.

In addition to the model analysis, future economic development corridor needs were included in the needs estimates. These are projects that may not have congestion issues throughout the entire corridor, but require corridor-long improvements to assure a network of high-level highways that accommodate the efficient movement of goods and people to support and enhance Iowa's economy.

More detail regarding how construction needs were estimated is included in Appendix B.

### **Summary of Projected Needs**

The 20-year projected needs for Iowa's primary, secondary and municipal road systems are \$67.2 billion. Table 8 is a summary of those needs and includes a breakdown of construction needs by pavement, bridge and capacity needs.

Table 8 – 2005 to 2024 Projected Needs for Iowa’s Public Roadway System

Type	Primary (State) billions	Secondary (Counties) billions	Municipal (Cities) billions	Total billions
Maintenance/Administration	\$9.281 billion	\$7.409 billion	\$11.457 billion	\$28.147 billion
Construction				
Pavement	\$5.071 billion	\$11.964 billion	\$3.624 billion	\$20.659 billion
Bridge	\$3.276 billion	\$3.795 billion	\$0.521 billion	\$7.592 billion
Capacity	\$9.384 billion	\$0.208 billion	\$1.241 billion	\$10.833 billion
Total	\$27.012 billion	\$23.376 billion	\$16.843 billion	\$67.231 billion

The \$67.231 billion in needs of Iowa’s public roadway system represents the total cost to address all deficiencies that exist now or are forecast to exist in the next 20 years. This does not take into account the fact that some of the needs have a cost that exceeds the anticipated benefits to the state. In an attempt to evaluate the rate of return of different improvement types, and recognizing the needs will far exceed available revenue over the next 20 years, an effort was made to prioritize needs based on minimum thresholds for preservation of the system and then the economic benefits of different types of improvements on roads with different traffic levels. For this effort, the process established during the last legislatively mandated review of future needs and RUTF revenue in 1988 was utilized. The process involves assigning needs based on a general hierarchy to first maintain, then preserve, expand, and finally modernize the public roadway system. Another component of the hierarchy is the assignment of different priorities for improvements based on expected rates of return on the government’s investment. The assignment of categories used for this report and the 1988 study of the RUTF is based on the following:

- Category 1
  - Maintenance
  - Administration
  - Debt service
- Category 2
  - Resurfacing of high-volume roads
  - Repair/replacement of structurally deficient bridges on high-volume roads
  - Reconstruction of very high-volume roads with poor pavement
- Category 3
  - Resurfacing of low-volume roads
  - Repair/replacement of structurally deficient bridges on low-volume roads
  - Repair/replacement of functionally obsolete bridges on high-volume roads
  - Reconstruction of high-volume roads with poor pavement
  - Capacity improvements on high-volume and CIN roads
- Category 4
  - All remaining capacity improvements
  - Repair/replacement of functionally obsolete bridges on moderate-volume roads
  - Reconstruction of moderate-volume roads with poor pavement

- Category 5
  - Repair/replacement of all remaining functionally obsolete bridges
  - Reconstruction of all remaining roads with poor pavement
- Category 6
  - All remaining reconstruction of roads with geometric deficiencies

The assignment of needs to these categories does not mean that all jurisdictions make funding decisions in this order, but rather this is intended to prioritize in a general manner the needs that exist in Iowa. Table 9 summarizes the distribution of needs among the six categories by jurisdiction.

Table 9 – 2005 to 2024 Projected Needs for Iowa’s Public Roadway System by Category

<b>Type</b>	<b>Primary (State) billions</b>	<b>Secondary (Counties) billions</b>	<b>Municipal (Cities) billions</b>	<b>Total billions</b>
Category 1	\$9.281	\$7.409	\$11.457	\$28.147
Category 2	\$7.258	\$3.598	\$2.523	\$13.379
Category 3	\$9.440	\$2.665	\$0.594	\$12.699
Category 4	\$0.680	\$1.370	\$1.216	\$3.266
Category 5	\$0.000	\$6.078	\$0.959	\$7.037
Category 6	\$0.353	\$2.256	\$0.094	\$2.703
Total	\$27.012	\$23.376	\$16.843	\$67.231

The three highest priority categories of needs (i.e., category 1, 2 and 3) cover maintenance, preservation and high return on investment needs. The high return on investment needs include critical capacity and reconstruction needs on the interstate and CIN, and critical needs on the Secondary Road System and Municipal Street System. Of those three highest priority categories, the Primary Road System needs are 48 percent of the total, the Secondary Road System needs are 25 percent of the total and Municipal Street System needs are 27 percent of the total. However, as will be documented in the “Needs versus Revenues” section, when evaluating the shortfall of funding to meet the most critical needs of Iowa’s public roadway system, the great majority of the shortfall is on the Primary Road System.

## Evaluation of Future Revenues

Earlier in this report the primary sources of revenues (federal, state and local) were discussed along with the issues facing all the sources. This section looks at the future of those revenue sources.

### Federal

Federal funding buying power for core construction programs for public roadways has not experienced growth as in prior years (see Figure 15). As with all funding sources, this has been further exacerbated by the large increase in construction costs. In the next few years, federal funding could be reduced significantly if changes are not made at the national level. For purposes of this forecast, it has been assumed that future federal funding will remain at a constant level, which assumes that necessary changes to sustain this funding level will be made by Congress.

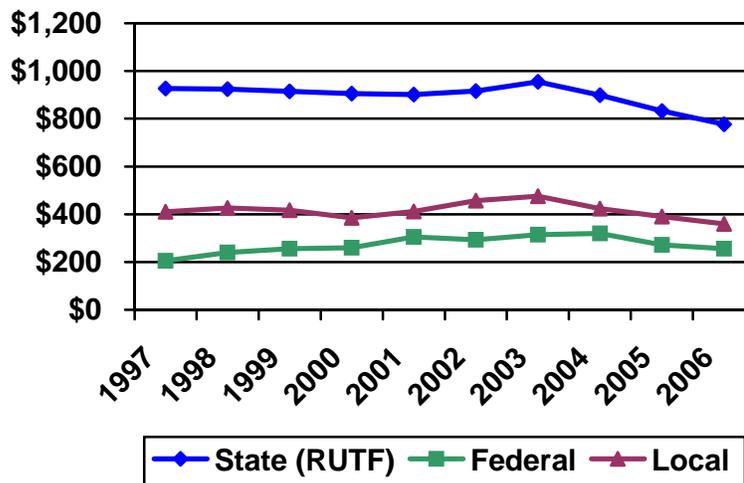
### State

Historically, between FY 1990 and FY 2000, the RUTF experienced average annual growth of 4.5 percent. From FY 2001 to FY 2006, the average annual growth of the RUTF has lowered to 1.5 percent. As with federal funding, state funding has seen very little growth recently and its buying power has diminished dramatically due to construction cost increases (see Figure 15). Based on forecasts of future travel, vehicle purchases and other factors that affect the RUTF revenue, the level of RUTF revenue will continue to annually increase slightly, but also continue to lose significant ground in buying power.

### Local

Local revenues, including bonding for cities, are forecast to stay flat in terms of actual dollars from year to year, which results in a significant loss of buying power over the 20-year period taking into account inflation.

Figure 15 – Historic Trends in Highway Funding Buying Power (constant 1997 dollars – millions)



Sources: Iowa DOT – Office of Program Management and Office of Systems Planning

### Loss of Buying Power

As mentioned in the discussion of all funding sources, a major impact on the ability to meet future needs is the loss of buying power due to increased construction costs. This has been a continuing impact on all jurisdictions, but has been extremely damaging the past 12 to 18 months as construction costs have increased dramatically. Since 2003, RUTF revenue has lost over half a billion dollars in buying power with a loss of \$260 million alone in 2006 (when compared to the 2003 funding level). Put simply, the Iowa DOT, cities and counties are spending as much or slightly more, but buying far less for their money.

An example of the impact of rising construction costs is what has happened to the cost to resurface a roadway. In 1989, the last time the fuel tax was significantly increased, it cost about \$140,000 per mile to resurface a two-lane roadway. Today, that same improvement costs about \$290,000 per mile. That's an increase of over 107 percent. Table 10 demonstrates how much less can be purchased today in comparison to 1989.

Table 10 – Impact of Inflation on Construction Costs from 1989 to 2006

Construction bid item	What could be purchased in 1989	What can be purchased in 2006 with increased construction prices	Lost buying power
Roadway excavation	\$9.90 could purchase 10 cubic yards	\$9.90 can purchase only 4 cubic yards	60 percent
Hot-mix asphalt surfacing	\$209.50 could purchase 10 tons	\$209.50 can purchase only 5 tons	50 percent
Portland Cement Concrete surfacing	\$1,401 could purchase 100 square yards	\$1,401 can purchase only 53 square yards	47 percent
Reinforcing steel	\$380 could purchase 1,000 lbs	\$380 can purchase only 528 lbs	47 percent
Structural steel	\$1,000 could purchase 1,000 lbs	\$1,000 can purchase only 661 lbs	34 percent
Structural concrete	\$16,931 could purchase 100 cubic yards	\$16,931 can purchase only 52 cubic yards	48 percent

Source: Iowa DOT – Office of Contracts

### Summary of Future Revenues

The 20-year projected revenues for Iowa's primary, secondary and municipal road systems are \$39.5 billion. The projections are based on the following assumptions.

- Federal revenue will remain constant over the 20 years resulting in a continuing loss of buying power.
- State revenue from the RUTF will grow about one-half percent a year which results in a continuing loss of buying power if construction costs grow faster than one-half percent a year.
- Local revenue will remain constant over the 20 years resulting in a continuing loss of buying power.

Table 11 is a summary of projected future revenues by jurisdiction.

Table 11 – 2005 to 2024 Projected Revenue for Iowa’s Public Roadway System

<b>Source</b>	<b>Primary (State) billions</b>	<b>Secondary (Counties) billions</b>	<b>Municipal (Cities) billions</b>	<b>Total billions</b>
Federal	\$4.251	\$1.120	\$0.786	\$6.157
State	\$10.951	\$6.943	\$4.047	\$21.941
Local	N/A	\$2.800	\$8.600	\$11.400
Total	\$15.202	\$10.863	\$13.433	\$39.498

## Needs versus Revenues

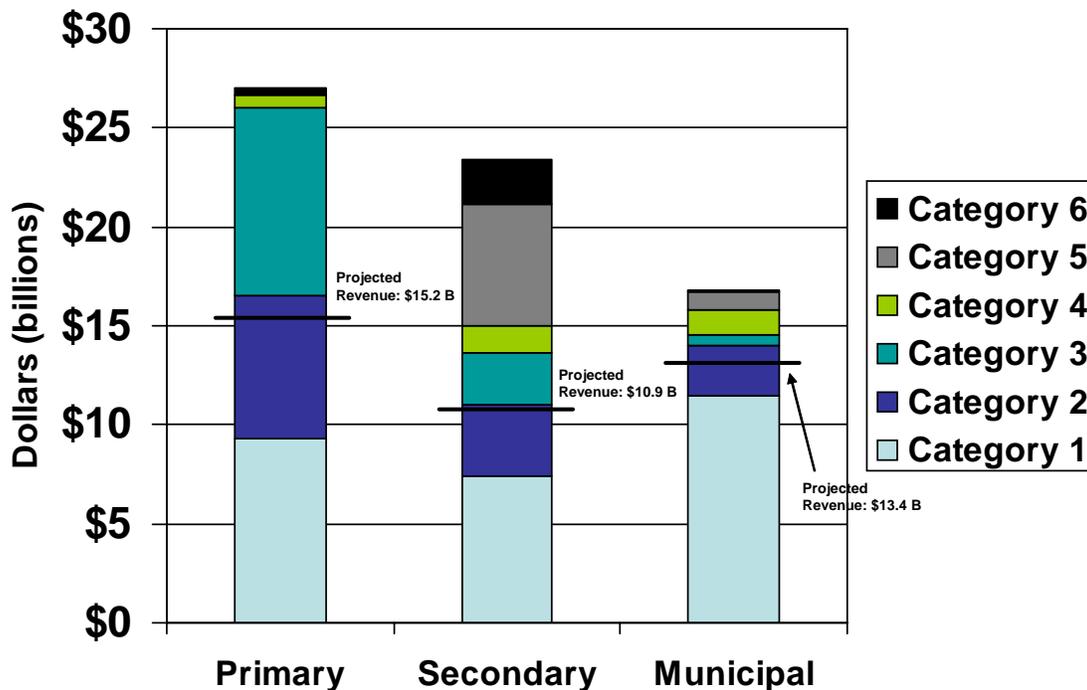
The analysis of future needs and revenues results in the identification of a large shortfall of funding. As summarized in Table 12, the shortfall across all jurisdictions totals \$27.7 billion over the 2005 to 2024 time period, or an annual shortfall of approximately \$1.4 billion.

Table 12 – 2005 to 2024 Funding Shortfall

	<b>Primary (State)</b> billions	<b>Secondary (Counties)</b> billions	<b>Municipal (Cities)</b> billions	<b>Total</b> billions
Needs	\$27.012	\$23.376	\$16.843	\$67.231
Revenue	\$15.202	\$10.863	\$13.433	\$39.498
Shortfall	(\$11.810)	(\$12.513)	(\$3.410)	(\$27.733)

Figure 16 is a graphical representation of the 20-year needs for each jurisdiction by category. Included in the figure is a line that shows for each jurisdiction the level of needs that could be addressed with projected revenues. All of the category 1 needs can be met with projected revenues; however, the revenue falls short of meeting the category 2 needs for all jurisdictions. Projected revenues will cover 82 percent of the Primary Road System category 2 needs, 96 percent of the Secondary Road System category 2 needs, and 85 percent of the Municipal Street System category 2 needs.

Figure 16 – Comparison of 20-Year Needs with Projected Revenue



To address the remaining unfunded category 2 needs would require approximately \$2 billion in additional revenue over 20 years for an average of about \$100 million per year. This level of funding would meet the most critical pavement and bridge preservation

needs in Iowa, but would not allow other vital pavement and bridge needs or important capacity and corridor improvements on the interstate and CIN to be addressed. This level of funding would result in continued deterioration of pavement and bridge conditions for all jurisdictions and no additional development of capacity and corridor projects on the interstate and CIN.

To stop deteriorating pavement and bridge conditions in Iowa, and to begin to address capacity and corridor improvements on the interstate and CIN, requires that the most critical category 3 needs be met. The category 3 needs total \$12.7 billion over the 2005 to 2024 time period. To meet those needs would require a revenue increase of over \$600 million per year, in addition to the \$100 million per year to meet the remaining category 2 needs. Because the amount of funding to meet all of the category 3 needs is so high, additional analysis was conducted to determine what portion of category 3 needs is most critical to support and enhance Iowa's economy.

The category 3 needs cover the following types of projects.

- resurfacing of low-volume roads;
- repair/replacement of structurally deficient bridges on low-volume roads;
- repair/replacement of functionally obsolete bridges on high-volume roads;
- reconstruction of high-volume roads with poor pavement; and
- capacity improvements on high-volume and CIN roads.

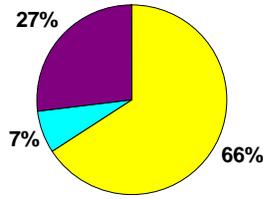
The large majority of category 3 needs (74 percent) are on the Primary Road System to address reconstruction needs on high-volume roads, bridge needs and capacity improvements on interstate and CIN roads. The Secondary Road System needs in this category (21 percent) are focused on resurfacing of low volume roads, bridge needs and reconstruction needs on their higher volume roads. The Municipal Street System needs (5 percent) are focused on resurfacing low-volume roads, reconstruction of high-volume roads and capacity improvements.

**The conclusion of this study is the most critical needs on Iowa's public roadway system can be met with an additional \$4 billion in revenue over the next 20-years. This corresponds to an annual revenue increase of \$200 million. The \$4 billion in revenue would cover the \$2 billion necessary to meet category 2 needs and \$2 billion of the most critical category 3 needs to sustain and enhance Iowa's economy. Ultimately, it will be up to the individual jurisdictions to utilize additional funding on needs unique to their area which may not exactly match the categorization utilized in this report.**

When determining the recommended distribution of the additional \$200 million per year of the RUTF revenue among the state, cities and counties, this study compared the existing revenue for each jurisdiction with the prioritized needs that could be addressed with additional revenue. Figure 17 contains two pie charts reflecting the distribution of the remaining unfunded category 2 needs and all of the category 3 needs by jurisdiction.

Figure 17 – Distribution of Unfunded Category 2 and Category 3 Needs

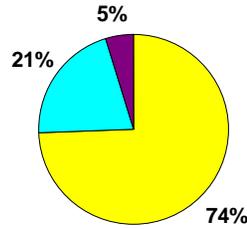
Distribution of Unfunded Category 2 Needs



Total: \$2.0 billion



Distribution of Category 3 Needs



Total: \$12.7 billion



The \$200 million per year of additional funding would first address the remaining category 2 needs and then the most critical category 3 needs. Using the distribution of needs for each category as shown in Figure 17, Table 13 reflects the distribution of additional funding based solely on an analysis of needs with the first \$100 million per year of additional funding going toward the remaining unfunded category 2 needs and the next \$100 million per year of additional funding going toward the critical category 3 needs.

Table 13 – Distribution of Additional Funding

Jurisdiction	Unfunded Category 2 Needs (\$100 million per year of additional funding)	Critical Category 3 Needs (\$100 million per year of additional funding)	Total (\$200 million per year of additional funding)
Primary (State)	\$66 million (66 %)	\$74 million (74 %)	\$140 million (70 %)
Secondary (County)	\$7 million (7 %)	\$21 million (21 %)	\$28 million (14 %)
Municipal (City)	\$27 million (27 %)	\$5 million (5 %)	\$32 million (16 %)

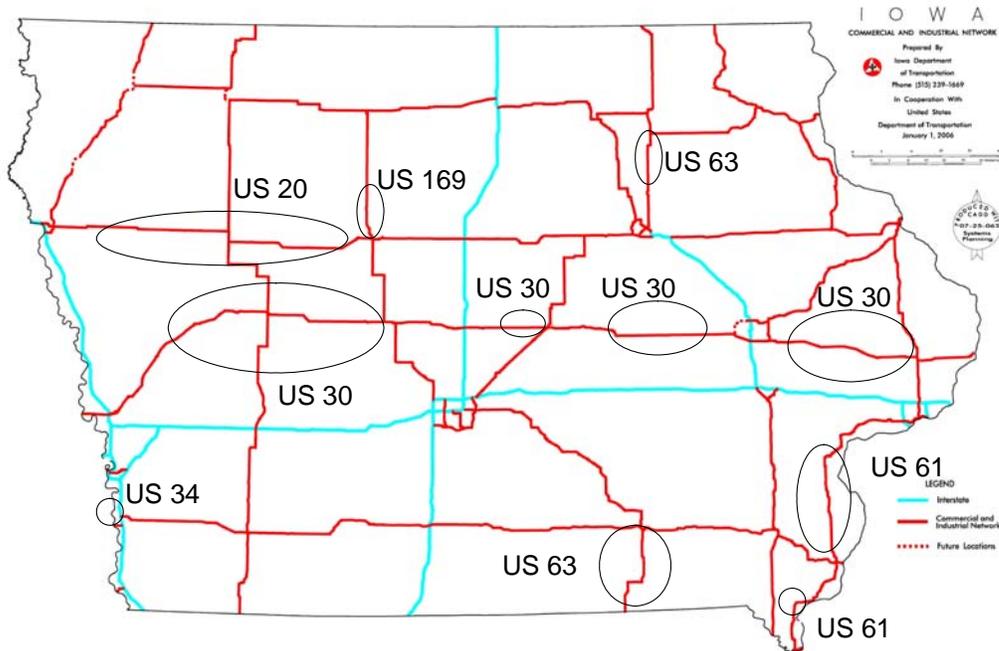
The distribution of unfunded category 2 and critical category 3 needs, to be addressed with the \$200 million per year of additional funding, results in a distribution of funding with the Primary Road System receiving 70 percent, Secondary Road System receiving 14 percent and Municipal Street System receiving 16 percent. Recognizing that this is a significant shift from the existing RUTF distribution percentages and that each jurisdiction prioritizes their needs differently, the following distribution of additional RUTF revenues is proposed:

- State – Primary Road System: 60 percent
- Counties – Secondary Road System: 20 percent
- Cities – Municipal Street System: 20 percent

On the Primary Road System, this additional funding would permit accelerated development of key corridors such as U.S. 20, U.S. 30, U.S. 34, U.S. 61, U.S. 63, and U.S. 169 as shown in Figure 18. With existing funding, it would take many decades to complete these corridors; additional funding will allow development to accelerate although it is clear that even the additional funding will not result in those needs being

met as quickly as desired. Key needs on the interstate, especially in and around urban areas, will also begin to be addressed with additional funding.

Figure 18 – Accelerated Development of Key CIN Corridors



There are many segments on the Primary Road System that require pavement resurfacing or reconstruction improvements that cannot be accomplished in a timely manner. Additional funding for the interstate and CIN allows the Iowa DOT to begin to address these critical preservation and reconstruction needs across Iowa with existing revenues.

Additional funding for the Secondary Road System would allow counties to address their most critical bridge needs and road needs on the Farm-to-Market Road System. These improvements are vital to the rural and state economy to support the renewable fuels industry and the movement of goods and people in rural Iowa.

The Municipal Street System is somewhat unique in that each city has different types of needs and priorities. Many cities require additional funding just to provide adequate maintenance of the existing system. Other cities would utilize additional funding to meet reconstruction, expansion or safety needs that may exist.

As is true for all jurisdictions, additional funding will allow critical needs to begin to be addressed, but additional funding will not address all the needs that exist in Iowa.

As stated earlier in the report, the 20-year needs are shown in future year dollars based on historic growth in construction costs. If recent trends of extremely high construction cost inflation continue, the needs estimate in this report will be low resulting in an increasing shortfall.

## Options for Addressing Funding Shortfall

Many alternative financing options were studied. Each option was evaluated based on the following factors:

- ability to produce significant funds;
- stability;
- efficiency (i.e., low administrative cost);
- equity; and
- feasibility.

Table 14 is a summary of existing RUTF revenue sources and options for generating increased revenue. Table 15 is a list of revenue mechanisms that are not currently utilized, but could be implemented to generate additional RUTF revenue.

Table 14 – Current RUTF Revenue Sources and Increase Options

Type of Financing	Description	Advantages	Disadvantages
<b>Fuel Tax</b>	<p>Cents per gallon tax on motor fuels, including some alternative fuels</p> <p><b>Option A to Increase Revenue:</b> Increase per-gallon tax on motor vehicle fuels equally for gasoline, gasohol and diesel based on existing rates of 21.0 cents per gallon for gasoline, 19.0 cents per gallon for gasohol and 22.5 cents per gallon for diesel (this assumes the gasohol subsidy will be extended beyond its 6/30/07 sunset)</p> <p>Each additional cent generates approximately \$22 million to the RUTF</p> <p><b>Option B to Increase Revenue:</b> Adjust fuel tax annually based on an inflation index (such as the Consumer Price Index)</p> <p>Additional revenue depends on rate of inflation. For example, a 3 percent increase in the Consumer Price Index applied to current fuel tax rates would generate an additional \$13 million annually.</p>	<ul style="list-style-type: none"> <li>• Collection and administration process already in place</li> <li>• Generally proportional to system usage</li> </ul>	<ul style="list-style-type: none"> <li>• Increased fuel efficiency results in lower revenue</li> <li>• Higher fuel prices lead to reduced driving and reduced fuel tax collections</li> <li>• Fees are fixed and do not adjust for inflation</li> </ul>
<b>Vehicle Registration</b>	<p>Fees charged to register and license vehicles and trailers</p> <p><b>Fee Schedule for Automobiles, Mini-Vans and Sport Utility Vehicles</b>  <math display="block">\text{Fee} = 1 \text{ percent of value} + \frac{\\$0.40 \times \text{Weight}}{100}</math> <ul style="list-style-type: none"> <li>• &lt; 5 model years old: value component of fee is not reduced</li> <li>• 5 model years old: 75 percent of value component is applied</li> <li>• 6 model years old: 50 percent of value component is applied</li> <li>• &gt;= 9 model years old: \$35 (1994 and newer model year)</li> <li>• The fee schedule varies based on age, type of vehicle and other factors for older model year vehicles</li> </ul> <p><b>Fee Schedule for Pickups (all trucks &lt;= 3 tons)</b></p> <ul style="list-style-type: none"> <li>• ≤ 10 model years old: \$65 per year</li> <li>• 11 to 13 model years old: \$55 per year</li> <li>• 14 to 15 model years old: \$45 per year</li> <li>• &gt; 15 model years old: \$35 per year</li> </ul> <p><b>Option A to Increase Revenue:</b> Increase the registration fee for pickup trucks making it equivalent to automobiles (i.e. vehicle weight and value). It would generate approximately \$57 million annually to the RUTF, if applied to all pickup trucks currently registered at 3, 4 and 5 tons.</p> <p>If weight-value adjustment applies only to model year 2009 and later</p> </p>	<ul style="list-style-type: none"> <li>• Collection and administration process already in place</li> <li>• Equitable for cars</li> </ul>	<ul style="list-style-type: none"> <li>• Not proportional to system usage</li> <li>• Higher administrative and enforcement costs</li> <li>• Not equitable for pickups</li> <li>• Encourages retention of older vehicles</li> </ul>

	<p>pickups (phased in approach), the additional revenue to the RUTF is projected as follows:</p> <ul style="list-style-type: none"> <li>• CY 2008: \$10 million</li> <li>• CY 2009: \$20 million</li> <li>• CY 2010: \$30 million</li> <li>• CY 2011: \$40 million</li> </ul> <p><b>Option B to Increase Revenue:</b> Increase the minimum vehicle registration fee (i.e. \$50 minimum instead of variable minimum for autos and \$35 minimum for trucks). This scenario would generate approximately \$19 million annually in additional revenue to the RUTF.</p>		
<b>Use Tax on Motor Vehicles</b>	<p>Five percent use tax that is imposed on the sale of new and used motor vehicles and trailers</p> <p><b>Option to Increase Revenue:</b> Increase the use tax to 6 percent, generating approximately \$40 million annually.</p>	<ul style="list-style-type: none"> <li>• Collection and administration process already in place</li> <li>• Provides revenue source based on ability to pay</li> <li>• Proportional to cost of vehicle</li> </ul>	<ul style="list-style-type: none"> <li>• Not proportional to system usage</li> <li>• May discourage sales of motor vehicles</li> <li>• Fluctuates with economic cycles</li> </ul>
<b>Driver's License Fee</b>	<p>A fee charged for the privilege to operate a motor vehicle</p> <p>\$4 per year (non-commercial)* \$8 per year (commercial)*</p> <p>* Does not include the one-time surcharge assessed through 6/30/08 for the driver information system update (\$3).</p> <p><b>Option A to Increase Revenue:</b> Doubling the driver's license fee would generate approximately \$12 million annually.</p> <p><b>Option B to Increase Revenue:</b> Institutionalize the current \$3 surcharge as an increase as of 7/1/08. It would generate approximately \$1.5 million per year, on average, beginning in FY 2009</p>	<ul style="list-style-type: none"> <li>• Collection and administration process already in place</li> <li>• Does not fluctuate with economic cycles</li> </ul>	<ul style="list-style-type: none"> <li>• Not proportional to system usage</li> </ul>

Table 15 – Potential RUTF Revenue Sources

Type of Financing	Description	Advantages	Disadvantages
<b>Sales Tax</b>	<p>Assess sales tax on fuel purchases.</p> <p>A 1 percent sales tax on fuel would generate approximately \$43 million per year based on fuel prices in November 2006.</p>	<ul style="list-style-type: none"> <li>• Provides a mechanism to apply local option sales tax on the purchase of fuel</li> <li>• Requires less frequent legislative action on fuel tax because revenues will increase as the price of fuel increases</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Administration and collection system would need to be developed</li> <li>• Because tax is tied to the price of fuel, the amount of tax could change significantly if fuel prices experience large fluctuations</li> </ul>
<b>Severance Tax on Exported Ethanol</b>	<p>A tax collected by the state either based on a percent of value or a volume-based fee on resources extracted from the earth that are exported out of the state. Typically charged to producer or first purchaser.</p> <p>Potential revenue dependent on rate set and volume exported. Assuming 65 percent of Iowa's ethanol production (1.5 billion gallons in CY 2006) is shipped out of the state, a severance tax of 1 cent per gallon would generate \$9.75 million per year.</p>	<ul style="list-style-type: none"> <li>• Creates opportunity to generate revenue from sources outside of Iowa</li> <li>• Compensates for roadway deterioration resulting from usage of system for the production of ethanol</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Administration and collection system would need to be developed</li> <li>• Potential regulatory issues</li> <li>• Could put the producer at competitive disadvantage</li> </ul>

<p><b>Per-Mile Tax</b></p>	<p>Tax based on the vehicle miles traveled within a state.</p> <p>Based on the vehicle miles traveled in Iowa in 2005 (31.6 billion), a 1 cent per-mile fee would generate \$316 million per year.</p>	<ul style="list-style-type: none"> <li>• More direct measure of actual costs incurred</li> <li>• Highly related to needs for capacity and system preservation because as travel increases, the need for capacity and preservation improvements increase, but so does revenue</li> <li>• Low tax rate needed to fund current needs</li> <li>• May be graduated based on vehicle size, weight, emissions or other characteristics</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Administration and collection system would need to be developed</li> <li>• Potentially high administrative, compliance and infrastructure costs</li> <li>• Technology needs to mature</li> <li>• Privacy concerns</li> </ul>
<p><b>Transportation Improvement District</b></p>	<p>Geographic areas are defined and tax imposed within the area to fund transportation improvements with voter approval.</p> <p>Revenue potential varies</p>	<ul style="list-style-type: none"> <li>• Satisfies urgent infrastructure needs, which exceed available finances</li> <li>• Encourages state, local and private-sector partnerships</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Administration and collection system would need to be developed</li> <li>• May be seen as an equity issue</li> </ul>
<p><b>Bonds for Primary Road System Improvements</b></p>	<p>A written promise to repay borrowed money at a fixed rate on a fixed schedule. Can be limited to very specific situations, such as projects that exceed a certain dollar threshold, projects that cannot easily be phased over time (border bridges) and/or projects that can reasonably generate sufficient revenue (tolls) to service their own bond debts.</p> <p>Revenue potential varies.</p>	<ul style="list-style-type: none"> <li>• Allows earlier and faster construction of facilities</li> <li>• Satisfies urgent infrastructure needs, which exceed available finances</li> <li>• Avoids inflationary construction costs</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Requires state or community to extend payments for long periods of time</li> <li>• Does not generate new money</li> <li>• May cost more over time due to bond interest</li> <li>• Requires annual resources be used for debt service rather than new needs</li> </ul>
<p><b>Privatization</b></p>	<p>Long-term leasing of toll roads to private sector for up-front payment.</p> <p>Revenue potential varies.</p>	<ul style="list-style-type: none"> <li>• Influx of one-time capital</li> <li>• Shifts responsibility to contractor</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Administrative process needed to let, execute, contract, and monitor performance</li> <li>• Requires high-usage corridor to be marketable; Iowa may not have any candidates</li> <li>• Built-in toll increases</li> <li>• Potentially higher tolls to make project profitable</li> <li>• Requires very long-term decision that removes flexibility</li> <li>• Very limited ability for in-state contractors to participate in construction</li> </ul>
<p><b>Tolling</b></p>	<p>Implementing fees to travel on road segments.</p> <p>Revenue potential varies based on length of tolled segment and toll rate, but a typical rate is 6 cents per mile.</p>	<ul style="list-style-type: none"> <li>• Specific road segments/corridors generate their own revenue</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• Expensive to initiate due to needed capital investment</li> <li>• Ongoing administrative costs</li> <li>• Requires sufficient traffic levels to generate enough revenue to pay for the costs of tolling, along with the maintenance and construction cost; Iowa may not have any reasonable corridors meeting requirements.</li> <li>• Public resistance may lead to adjustments in travel patterns to avoid tolls</li> <li>• There are federal restrictions in some cases</li> </ul>

<p><b>Development Impact Fees</b></p>	<p>A fee charged to developers for off-site infrastructure needs that arise as a result of new development.</p>	<ul style="list-style-type: none"> <li>• Additional source of funding to offset increased needs due to new development</li> <li>• Places the cost of improvement on the development that caused the need</li> </ul>	<ul style="list-style-type: none"> <li>• Typically a local jurisdiction fee and is difficult to apply statewide</li> <li>• Potential negative impact on future development</li> <li>• Can be difficult to establish and administer</li> <li>• Can be an equity issue when costs are passed on to homeowners in the case of a housing development</li> </ul>
<p><b>Public-Private Partnerships (PPPs)</b></p>	<p>Contractual agreements formed between a public agency and private sector entity that allow private participation in the delivery of transportation projects.</p> <p>Revenue potential varies.</p>	<ul style="list-style-type: none"> <li>• Expedited completion compared to conventional delivery methods</li> <li>• Avoids inflationary construction costs</li> <li>• Delivery of new technology developed by private entities</li> <li>• Substitution of private resources and personnel for constrained public resources</li> <li>• Access to new sources of private capital</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enabling legislation</li> <li>• May be less efficient</li> <li>• Could lead to higher tolling than under a public-only project</li> <li>• Very limited ability for in-state contractors to participate in construction</li> </ul>

## **Findings and Recommendations**

As with the rest of the nation, Iowa is on the verge of a transportation crisis. This is the result of flattening revenues, dramatically increasing construction costs, aging infrastructure, increasing usage, and deferred maintenance. While the system is not yet broken, it is at the tipping point where the cost to recover will grow exponentially if action is not taken now. As documented in this report, Iowa is already facing a \$27.7 billion shortfall in the next 20 years.

The \$27.7 billion shortfall represents an ideal level of investment which cannot be fully funded in light of the needs that exist for all levels of government and the services they provide. However, there are critical needs that must be met to avert a transportation crisis. The Iowa DOT worked with city and county officials to identify those improvements that would provide the greatest benefit to preservation of the system as well as those improvements that would provide the greatest economic development opportunities.

At the state level, critical needs exist on the interstate and CIN. These systems are vital to the economic growth and prosperity of Iowa. From the input received during the development of this study, and received by the Iowa Transportation Commission, it is clear that to maintain and grow Iowa's economy significant investments on the interstate and CIN are necessary to provide all regions of Iowa with access to high-quality transportation which is reliable and efficient. Absent additional funding, it will either be impossible or take a very long time to complete improvements on corridors such as U.S. 20, U.S. 30, U.S. 34, U.S. 61, U.S. 63, U.S. 169, and many others.

At the county level, the large number of structurally deficient bridges and deteriorating conditions on the Farm-to-Market Road System are impacting the efficient movement of people and goods. If these needs are not addressed, more bridges will have to be closed and roads vital to the movement of agricultural products will deteriorate, impacting local, regional and statewide economies. These roadways and bridges are even more important with Iowa's burgeoning biofuels industry.

Cities are facing issues similar to the Iowa DOT and counties, with deteriorating pavement conditions, deferred/reduced maintenance, and the inability to meet the demand for new and/or expanded roadways. The highest priority needs for Iowa's cities are a backlog of maintenance needs critical to supporting and encouraging economic development.

Through the development of this report, the Iowa DOT, city and county officials reached consensus on the following points:

- Existing RUTF revenues should continue to flow through the existing distribution formula, and any natural growth in those revenues should also continue to flow through the existing distribution formula.
- If new funding sources are created or existing funding sources increased, the new revenue should be placed in a new fund.

- If a new fund is created, it should be distributed through a new formula (60 percent to the state, 20 percent to the cities and 20 percent to the counties) and targeted to particular needs that best enhance and support Iowa's rural and urban economies.
- The minimum amount of new funding needed today to meet the most critical needs to sustain and enhance Iowa's economy is \$200 million per year.
- Implementation of funding increases can be phased in over two years to better manage the impact on users.
- Any additional new revenue generated beyond \$200 million should be distributed through the existing RUTF distribution formula.
- The additional revenue targeted to critical needs in Iowa will result in improvements that have the greatest impact on sustaining and enhancing Iowa's economy; however, it still falls well short of meeting all the needs that exist on Iowa's public roadway system. On a system-wide basis, it is expected that even if the recommended funding level is achieved, pavement and bridge infrastructure will continue to worsen, although at a slower pace. It is also expected that on low-volume county roads, road and bridge conditions will continue to worsen resulting in more closed bridges, bridges with load restrictions and roads being classified as area service 'b' or area service 'c.'

It is important to note that the points listed above are all inter-related and in their entirety result in consensus among Iowa DOT, city and county officials. Therefore, it is important that the recommendations are evaluated as a package of recommendations, rather than a list of individual recommendations for consideration.

Based on the findings of the study, the following actions are recommended and endorsed by the Iowa DOT, Iowa County Engineers Association, Iowa State Association of County Supervisors, Iowa State Association of Counties, and Iowa League of Cities:

**1) Create a *Transportation Investment Moves the Economy in the 21<sup>st</sup> Century (TIME-21) Fund***

Additional investment in Iowa's public roadway system is vital to sustain and grow our state's economy. This new fund will target new revenue to those areas particularly important to Iowa's economy.

TIME-21 funding for the Primary Road System will be spent on the interstate and CIN system. This will permit continued development of corridors critical to connect Iowa with regional, national and international markets. Further improvements will increase efficiency and safety resulting in economic growth to all regions of the state. With additional revenue from the TIME-21 Fund to help meet the needs of the interstate and CIN, a greater amount of existing RUTF revenue becomes available to address needs on the rest of the Primary Road System, which otherwise would not be addressed for many years.

At the county level, funding will be targeted heavily toward replacing deficient bridges. These bridge deficiencies hinder the efficient movement of agricultural products and

jeopardize medical and fire services in rural Iowa. Enhancements to the Farm-to-Market Road System will also be targeted. This system of county roads serves a key role in the support and development of Iowa's value-added agriculture economy. Improvements to the Farm-to-Market Road System are needed to assure efficient movement of products to market and, in particular, value-added biofuel industries. The Farm-to-Market Road System is also taking on an increasing role in support of the commuting of rural Iowans to jobs in regional and metropolitan centers.

At the city level, each community will assess its own unique needs. Many will target funding toward sustaining the overall street network. This will be accomplished by directing resources first to cost-effective maintenance. This will allow cities to budget other local, state and federal funds to streets that are critical to economic growth and development. Reconstruction, expansion and safety will be priorities after maintenance needs are addressed.

**2) Enact Changes to the Iowa Code that Generate a Minimum of \$200 Million in New Revenue for the TIME-21 Fund**

The TIME-21 Fund will ultimately require a minimum of \$200 million per year of funding. This funding will be generated using a mechanism or mix of mechanisms described in the "Options for Addressing Funding Shortfall" section of this study. Any funding generated beyond the \$200 million necessary for the TIME-21 Fund should be distributed via the existing RUTF distribution formula.

Consistent with past RUTF revenue increases, it is recommended any increase in revenue be phased-in over two years.

**3) Establish a 60 Percent State, 20 Percent City and 20 Percent County Funding Distribution Formula for the TIME-21 Fund**

To address critical needs and to maximize the impact of additional revenues, the TIME-21 Fund should be distributed as follows:

- 60 percent to the state for use on the interstate and CIN;
- 20 percent to cities, on a per capita basis, via the Street Construction Fund of the Cities to sustain and improve the Municipal Street System; and
- 20 percent to counties via the Secondary Road Fund for use on all secondary road bridges and maintenance and construction improvements on the Farm-to-Market Road System. The Secondary Road Fund is distributed to counties using a formula based on area, miles of road, vehicle miles of travel, rural population, and length of bridges.

**4) Continue Evaluation of Alternative Funding Mechanisms**

The alternative funding mechanisms evaluated as part of this study, but not adopted by the legislature as funding sources, warrant additional study. For example, the per-mile user fee, which is not technically possible now, may be the best solution to assess user fees in an equitable manner as the country eventually moves toward alternative-fueled vehicles. The Iowa DOT should continue to study alternative funding sources and report

at least every five years to the legislature on the advantages and disadvantages, and viability of alternative funding sources.

**5) Perform Regular Reevaluation of Needs and Revenues and Report to the Legislature**

As documented in this report, there are many issues impacting the Iowa DOT's, cities' and counties' ability to address the needs of the public roadway system. These issues include the rapid changes in construction costs, level of all sources of funding, rising volume of freight movements, increasing ethanol/biodiesel production, changing commuting patterns, aging population, and many others. As a result of this dynamic environment, it is prudent to reevaluate, on a regular basis, the long-range maintenance and construction needs of the public roadway system, and the ability of existing RUTF revenues (including new TIME-21 Fund revenues) to meet those needs. The Iowa DOT, in consultation with cities, counties and other interested parties, should be directed to conduct a study similar to this one at least every five years and provide a written report to the legislature summarizing the study.

**Absent additional revenue for the public roadway system, Iowans can expect a dramatic decrease in pavement and bridge conditions in the coming years. In addition, congestion in and around urban areas and along much of the interstate (rural and urban) will increase significantly. Finally, corridor improvements on the CIN will not be addressed. All of these impacts to the public roadway system end up damaging Iowa's economy. Transportation costs will increase for both the public and businesses and opportunities for economic development will be lost to other states.**

## **Appendix A**

### **List of Group/Association Representatives**

During the development of this report, many groups and associations met with Iowa DOT, city and county officials to share their input regarding the future of Iowa's public roadway system. Following is a list of the representatives that met with the group:

- Iowa State Association of Counties/Iowa County Engineers Association
  - Mike King, supervisor, Union County
  - Mike Wentzien, Iowa State Association of Counties
  - John Easter, director of intergovernmental affairs, Iowa State Association of Counties
  - Mike McClain, president, Iowa County Engineers Association; Jones County Engineer
- American Public Works Association
  - William Stowe, president, Iowa Chapter, American Public Works Association; public works director, city of Des Moines
  - Richard Fosse, president-elect, Iowa Chapter, American Public Works Association; public works director, city of Iowa City
- Iowa League of Cities
  - Thomas Bredeweg, executive director, Iowa League of Cities
- Iowa Association of Regional Councils
  - Tom Kane, executive director, Des Moines Area Metropolitan Planning Organization
- Iowa Farm Bureau Federation
  - Joe Johnson, state policy advisor, Iowa Farm Bureau Federation
  - Spencer Parkinson, research analyst, Iowa Farm Bureau Federation
- Iowa Motor Truck Association
  - Scott Weiser, president, Iowa Motor Truck Association
- Association of Business and Industry (ABI)
  - John Gilliland, senior vice-president, government relations, Association of Business and Industry
- Iowa Chamber Alliance
  - Dave Roederer, executive director, Iowa Chamber Alliance
- Professional Developers of Iowa
  - Stephen Lacina, executive director, Cedar County Economic Development Commission
  - Craig Patterson, lobbyist, Professional Developers of Iowa
- Southwest Iowa Coalition (U.S. 34)
  - Larry Winum, president, Glenwood State Bank
  - Jim Ebmeier, Mills County engineer
- U.S. 169 Corridor
  - Romaine Lee, supervisor, Humboldt County

- U.S. 20 Association
  - Shirley Phillips, Sac County Economic and Tourism Development
  - V.H. 'Buck' Boekelman, Fort Dodge Chamber
  - Steve Hoesel, executive director, MIDAS Council of Governments
- U.S. 63 Corridor
  - Bob Soukup, economic development director, city of New Hampton
  - David Yahnke, Bank of the West, Bloomfield
  - Joy Evans, Davis County Economic Development Corporation
- U.S. 30 Coalition
  - Bill Christensen, mayor, city of Toledo
  - Edith Pfeffer, U.S. 30 Coalition in Eastern Iowa
  - Tom Determann, chair, Clinton Regional Development Corporation
  - Clyde Bradley
- Iowa 44 Association
  - Rick Hunsaker, executive director, Region XII Council of Governments

## **Appendix B**

### **Estimation of Roadway Construction Needs**

#### **Road Needs**

Road needs were primarily modeled based on the Highway Economic Requirements System for States (HERS-ST). The HERS-ST model is a highway investment/performance model that considers engineering and economic concepts and principles in reviewing the impact of alternative highway investment levels and program structures on highway condition, performance and user impacts. Specifically, the HERS-ST model simulates highway condition and performance levels, and identifies deficiencies through the use of engineering principles. For the purposes of this study, the HERS-ST model was used to identify full engineering needs, which means that all deficiencies and corresponding improvements were identified regardless of the estimated benefit or cost of the improvement.

The HERS-ST model utilizes existing data for all public roads in Iowa for conditions, traffic and geometrics. The model evaluates existing data to determine deficiencies in any of the following categories:

**Pavement condition:** Pavement conditions influence user costs, i.e., operating costs, safety and travel time. HERS-ST accepts pavement condition measured either as PSR (Present Serviceability Rating) or IRI (International Roughness Index), but conducts its calculations internally in PSR.

**Surface type:** There are five surface types: high flexible; high rigid; intermediate; low; and unpaved. The type of surface affects the PSR; and, therefore, impacts vehicle operating costs such as fuel consumption.

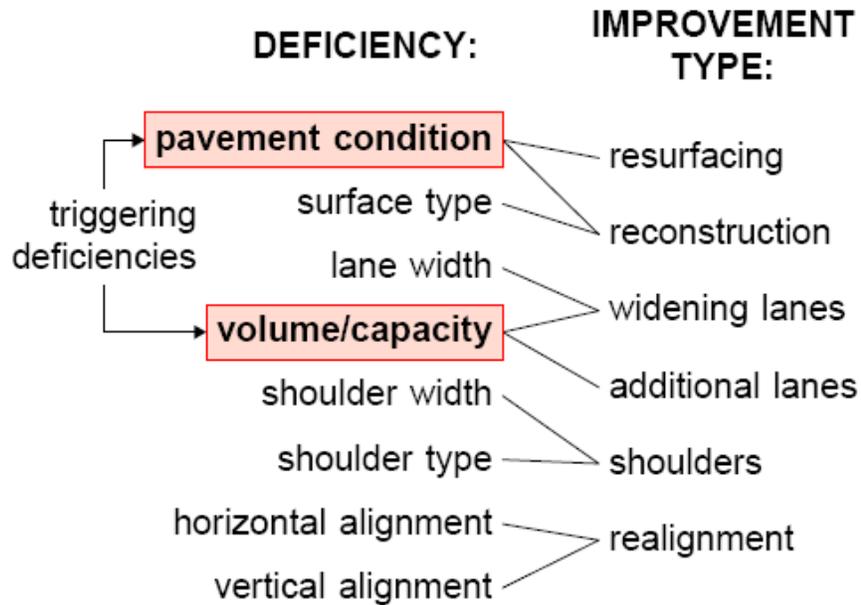
**Volume/Capacity:** Levels of congestion are measured according to volume to capacity (V/C) ratios. Peak V/C is not included in the section data, so V/C is estimated from capacity, annual average daily traffic (AADT), and the K-factor for the section. In the case of an unacceptable V/C ratio, the HERS-ST procedure chooses the most aggressive widening option warranted by the section's characteristics.

**Lane width and right shoulder width:** The lane width of a highway influences both capacity and safety. Substandard lane widths tend to reduce the capacity of a highway, and may affect safety. Lane widths are considered more important on the higher functional systems.

**Shoulder type:** There are five shoulder types: surfaced; stabilized; combination; earth; and curbed. The shoulder type affects the capacity level of a highway, which in turn impacts safety, travel time and vehicle operating costs.

**Horizontal and vertical alignment:** The alignment of a highway affects the speed at which vehicles may safely travel. Both horizontal and vertical types of alignment contribute to the level of service and safety of a highway, and impact operating costs. Horizontal alignment affects speed and sight distance, while vertical alignment affects sight distance, operating costs and speed, primarily for trucks.

Any existing deficiency identified by the HERS-ST model results in the identification of an improvement need to address that deficiency. The following chart generally identifies the deficiency type and corresponding improvement:



Using standard improvement costs, a dollar value is assigned for each improvement. The existing data for the section is modified to reflect the improvement.

In four, five-year increments, the deficiency identification process is repeated except the condition data is deteriorated and traffic data expanded to reflect expected changes over the five-year period. Any identified deficiencies are corrected with an improvement and a cost assigned for that improvement.

After the four, five-year increments are modeled; HERS-ST will aggregate and summarize the improvement costs to determine 20-year needs.

### **Bridge Needs**

Bridge needs are estimated through a very similar process to road needs. The bridge needs are estimated using a Federal Highway Administration program called HWYNEEDS. The following table shows the deficiency types identified by the model and the corresponding improvement type:

<b>Deficiency</b>	<b>Improvement</b>
Insufficient horizontal clearance	Replace/Reconstruct
Gross load	Strengthen/Rehabilitate
Substructure condition	Strengthen/Rehabilitate
Superstructure condition	Strengthen/Rehabilitate
Structure width	Widen
Deck condition	Deck Repair
Channel/Culvert condition	Channel/Culvert repair
Gross load and structure width	Replace/Reconstruct
Gross load and vertical clearance	Replace/Reconstruct
Substructure condition and superstructure condition	Replace/Reconstruct
Structure width and substructure condition	Replace/Reconstruct
Structure width and superstructure condition	Replace/Reconstruct

### **Major Project Analysis**

In conjunction with the road and bridge deficiency modeling, the Iowa DOT conducted detailed analyses of existing and projected major project needs on the Primary Road System. These needs are the result of past and present planning studies, public input, special studies, and other efforts. The results of this analysis were included in the assessment of needs on the Primary Road System.

Individual counties and cities also have detailed information on the needs that exist on their system today and in the future.