

Chapter 6: Future Regional Transportation Threats, Solutions, and Alternatives

I. Overview

Through analysis of key population, economic, traffic, and current condition trends amongst SRTPA, the transportation threats, solutions, and alternatives confronting the region is discussed. A non-all-inclusive list of the most agreed upon transportation threats, solutions, and alternatives likely to occur is listed in the following table. The list was first compiled during the development of the 2035 LRTP and has been updated periodically.

Transportation Threats
Aging infrastructure
Aging population
Decrease in population
Decrease in funding and buying power
Pavement and bridges were not designed to carry weight loads that they do
Increased rail traffic
Weather
Transportation Solutions (Opportunities)
Regional Airports
Development of Trails
Railroads
Tourism opportunities
Improvements on infrastructure and surrounding infrastructure will bring development
Carpooling
The expansion of expressway bypass outside of Le Mars
State Funding Legislation
Transportation Alternatives
Bridge replacement alternatives
Automated Vehicles
Rumble strips
Enhanced efforts to improve locations of utility lines
Invoice miles to drivers for wear and tear on the roads
4-to-3-Lane Conversions

A. Transportation Threats

The following transportation threats have been identified by the public and stakeholders as negative possibilities and conditions that are believed to likely occur and hinder the efficiency and safety of SRTPA's transportation network. Please note the following is a general consensus of the issues at hand.

1. Aging infrastructure

The aging of SRTPA's transportation network infrastructure has continued to be a growing concern. As the need to maintain and rehabilitate the region's aging infrastructure increases, the transportation funds available remains stagnant and even decreases in some cases. The contradicting trends of aging infrastructure and funding is heightened due to the high proportion of roads amongst SRTPA were built near the same time. The necessity to renovate and repair numerous roads simultaneously or in a short time span is a potential consequence of having a large portion of SRTPA's transportation network being built in the same time period. Transportation trends discussed in SIMPCO's *U.S. Highway 20 Corridor Economic Development Study* plan add additional concerns towards the region's aging infrastructure; there has been a steady increase in the average Vehicle Miles Traveled (VMT) from 2008 to 2016 and there has been an increase on the share of major roads Annual Average Daily Traffic (AADT) that Trucking vehicles account for, accounting for more than 20% in some cases. The rising VMT and Trucking AADT leaves roads that are currently in poor condition vulnerable to further deterioration. Financially, the price of materials has been inconsistent with sharp increases and slight declines per year and with the rise of the inflation rate slightly increasing since January 2000, this is a significant issue. Because many of the roads were built at approximately the same time, renovation and repair will be required simultaneously. This is especially difficult since an increase in the price of materials and a decrease in funding is currently the norm. The price increase of materials and decrease in funding sources is the reason this transportation threat should be a source of concern.

2. Aging population

Revamping SRTPA's transportation safety measures is on a path to being a predominant concern as population of the region continues to age. Previously discussed in Chapter 3, the median age in each of SRTPA's counties increased from 2000 to 2010 and will continue to rise during the foreseeable future due to the sheer size of the "baby-boomer" population and

their influencing population cohort. Safety measures featuring larger signage and signage placement for optimal viewing are examples of measures needed to be taken to adequately address the increasing proportion of aging drivers. An indirect countermeasure to the increase in aging drivers is the reality of mobility decreasing as the population ages, leaving the safety issue acute in rural areas where transit is primarily provided by personal vehicles. Individuals incapable of driving will become more common and the focus of the region's mobility issues as well. Opportunities to improve upon SRTPA's existing services and accommodating the aging population include carpooling, simple neighborliness, SRTS, churches, assisted living facilities, and non-profit agencies. Human service agencies is an additional source of alternative means of transportation for the aging population as well.

3. Decrease in population

As referenced in Chapter 3, SRTPA's population has gradually been decreasing over the decades with the declines more concentrated in the rural counties of Cherokee, Ida, and Monona. The declining trend is foreseen to continue throughout the duration of the LRTP. As time progresses, requirements for new infrastructure and maintenance on roads will change, increase, and be more demanding. A shrinking population poses a threat on SRTPA's transportation network, as it may lead to the region's inability of generating enough revenue required to meet the changing and greater demands on new infrastructure and maintenance.

4. Decrease in funding and buying power

The fundamental issue that SRTPA, Iowa, and majority of the U.S. will confront is shrinking distribution in funds allocated towards infrastructure. An increase in funding is required to keep up with inflation. However, inflation is not the only problem; a decline in the buying power of materials for roads is a major concern. With the price of materials rising due to high fuel costs, the probability of funding decrease is certain. If funding does not increase on level with all the obstacles, support for new projects is precarious. If funding remains flat, only preservation for the existing system can remain in place. According to the U.S. DOT the state of Iowa ranks 13th amongst all states in the total mileage of public roadways¹ as of 2017 and ranks 7th amongst all states in the total number of bridges² as of 2018. According the U.S. Census most recent population estimates (2018) and land mass Iowa ranks 31st and 23rd amongst all states. Iowa has an extraordinary road network given its population size and the

¹ U.S. Department of Transportation, Federal Highway Administration, Highway Statistics 2017, Section 4: Highway Infrastructure, Public Roads Length by functional system, Table HM-20.

² U.S. Department of Transportation, Federal Highway Administration, Highway Statistics 2017, Section 3: Bridges, Count, Area, Length of Bridges by Highway System

landmass. Iowa faces in the approaching 20 years, a shortfall of in system maintenance funding.

During the development of the 2035 LRTP, IDOT was preparing a report (TIME-21) that outlined the shortfalls Iowa could anticipate over the next 20 years and how roads would be affected. The need to maintain and improve aging infrastructure was discussed as the costs were increasing and the funds allocated toward roads remained flat and decreased in some cases. TIME-21 was legislated in 2008 and approved a set amount of revenue that was intended to prevent steep shortfalls in funding and added new revenues through changing vehicle registration fees and schedules and increasing trailer and title fees. The legislation was successful in bridging some of the shortfalls but Iowa and the surrounding region are still in need of additional revenue to maintain their transportation networks.

Shortly after the approval of the previous LRTP, the Senate File 257 was passed in at legislative session in 2015. The newly signed law was another source combating the funding shortfalls as the major component of the bill featured the increase of the state fuel tax. The increase in tax has led to jurisdictions across Iowa having the ability to allocate those additional generated funds into road and bridge construction projects. It is estimated that the passing of Senate File 257 will generate approximately \$215 million in additional transportation revenue annually to meet Iowa's critical roadway needs. Today, state fuel taxes make up 41% of state road revenue and federal fuel taxes make up about 90% of receipts allocated to the federal Highway Trust Fund. As time progresses and vehicles become more efficient, the impact on the fuel tax revenue collections will become more severe. The two biggest threats to the state's fuel tax revenue collections is currently the increasing fuel economy and alternatively fueled vehicles. Since the year 2000, the average fleet fuel economy has increased from 24.8 miles per gallon to 31.5 in 2014. There is an increasing market share for alternative fuel vehicles such as electric vehicles as well.

The following table illustrates the decline in buying power that is expected to continue for six different types of materials used in construction from 1989 to 2018.

	Roadway Excavation	Hot-Mix Asphalt Surfacing	Portland Cement Concrete Surfacing	Reinforcing Steel	Structural Steel	Structural Concrete
1989	10 CY / \$9.90	10 Tons / \$209.5	100 SY / \$1,401	1000 lbs. / \$380	1000 lbs. / \$780	100 CY / \$16,931
2006	4.32 CY / \$9.90	4.93 Tons / \$209.5	53.7 SY / \$1,401	542.86 lbs. / \$380	665.46 lbs. / \$780	52.24 CY / \$16,931
2013	2.5 CY / \$9.90	3.27 Tons / \$209.5	45.35 SY / \$1,401	441.86 lbs. / \$380	395.94 lbs. / \$780	40.63 CY / \$16,931
2018	2.53 CY / \$9.90	3.33 Tons / \$209.5	36.38 SY / \$1,401	361.9 lbs. / \$380	561.15 lbs. / \$780	28.82 CY / \$16,931
Buying Power Decline (%)	74.70%	66.70%	63.62%	63.81%	43.85%	71.18%
CY = Cubic Yards; SY = Square Yards; lbs. = Pounds						
Source: IDOT Office of Contracts, Price Trend Index for Iowa Highway Construction						

5. Pavement and bridges were not designed to bear current weight loads

The weight load that pavement was designed for when originally constructed amongst SRTPA's county and local roadways is currently being exceeded. The societal changes and norms on the size and amount of modern vehicles and equipment has contributed to safety and structural problems in the region. The increase in transportation of goods has exceeded the limits of what SRTPA's transportation network can accommodate, leading to further deterioration as well. Although the growing output of goods and products has positively impacted the economy, the economic impact has been at the expense of the region's transportation network placing a large burden.

6. Increased rail traffic

SRTPA has benefited from a recent increase in products being exported out of and imported into the region. The rising shipment in products correlates to a greater frequency in rail traffic. The necessity to introduce greater and effective safety measures for drivers is a direct outcome of the shipment in products and frequency rail traffic correlation. Examples of safety measures for consideration include additional motorist safety items such as cross bars, gates, and improved lighting to create more awareness for driver's surroundings.

7. Weather

Weather is often unpredictable and adds to the complexity of determining maintenance and repair costs. Weather during the winter season places great stress on SRTPA's roadways. Freeze and thaw cycles lead to potholes and cracks developing on the surface of roads and is difficult to determine the appropriate amount of funds to allocate for plowing and salting the roads. SRTPA is vulnerable to flooding, flash flooding, and tornadoes in some cases during the spring and early summer season when storms produce above-average precipitation. Significant amounts of flooding along the Missouri River, Big Sioux River, and Little Sioux River have occurred in recent years. In addition to damage to roads and trails, flooding can lead to closure of roads that reside within the river's watershed and bridges to

washout as well. The aftermath of severe flooding and storms can lingering damage to roadway infrastructure, stagnate recovery efforts, and destabilize a transportation network's efficiency. It is important to stress that transportation costs and funding is often subject to change due to the unpredictable nature of weather.

B. Transportation Solutions

The following transportation solutions have been identified by the public and stakeholders as potential opportunities to be considered and further researched on for the betterment of SRTPA. Please note the following is a general consensus of the issues at hand.

1. Regional Airport

The development of additional regional airports would be advantageous for SRTPA. As stated in Chapter Four, there are a total of four airports in the region classified as either General or Local Service. The only regional airport, Sioux Gateway Airport, is located just outside SRTPA and in the Sioux City Metropolitan Area however. In addition to transporting passengers, the installation of an additional regional airport would create another opportunity to transfer cargo and goods at a more an efficient rate. Employment opportunities through the regional airport would be an additional economic benefit to the region as well. A centrally located regional airport amongst SRTPA would cater to all its residents and businesses regarding accessibility and travel time. Majority of the region is located further than a 30 minute drive [Figure 1] from the Sioux Gateway Airport.



2. Development of Trails

Adequate space and opportunity to continue developing trails amongst SRTPA exists. IDOT previously commissioned a study identifying routes for the Lewis and Clark Multi-Use Trail³ that would expand the existing trail network located in the southern portion of SIMPCO MPO stretching south through Woodbury and Monona County and beyond. In collaboration with RDG Planning & Design and the Lewis and Clark Trail Steering and Project Committee, a plan for developing IDOT's identified trail routes has been completed. The potential of attracting tourists from outside the region and garnering additional economic traffic exists through the Lewis and Clark Multi-Use Trail. IDOT recently published the *Iowa in Motion 2045 – State*

³ Lewis and Clark Multiuse Trail - <https://iowadot.gov/lewisclarktrail/>

*Transportation Plan*⁴ plan which discusses multimodal transportation over the next several decades. The plan is intended to encourage coordination and serve as the primary guide for statewide decision-making regarding bicycle and pedestrian programs and facilities, including sidewalks, trails, bike lanes, paved shoulders, and other trail elements.

3. Railroads

Railroads have become more prevalent in SRTPA's economy as train's carrying capacity has increased. A larger carrying capacity allows for the transportation of goods through rail to be conducted in a timelier and cost effective manner. Updating the safety features of the railroads to accommodate larger carrying capacity is an additional opportunity that could become a necessity to preserve safety of SRTPA's transportation network.

4. Tourism Opportunities

The opportunity to improve a city or region's tourism always exists. Several marketable opportunities within SRTPA are in place for tourism to potentially be a relevant source of economic gains. Monona and Woodbury Counties align with the Missouri River and SRTPA is located in the Loess Hills which is a unique landscape and can be found only in Iowa and a region of China. The Lewis and Clark Multi-Use Trail that was listed above in the development of trails section could be a significant tourism opportunity. The Iowa Department of Natural Resources (Iowa DNR) along with SIMPCO's assistance conducted a study that involved identifying water trails to be selected as a Statewide Designated Water Trail; the Big Sioux River that stretches through SRTPA was identified as a Statewide Designated Water Trail. This may provide another outlet for prospective tourism opportunities. Other prospects may include regional events and locations that can be found on each counties and cities website. By providing activities, tourism makes life richer for the families in all of the surrounding communities and could potentially help attract young people and families to the area as a place to settle. By creating a tourism outlet, infrastructure must be continually updated to serve not only the community but those visiting as well. TAP funds could be invested in the roads, streetscapes, trails, and cultural or historical facilities to leave a favorable impression upon the tourists journeying to the region, examples of these facilities include the Loess Hills and the Scenic Byway.

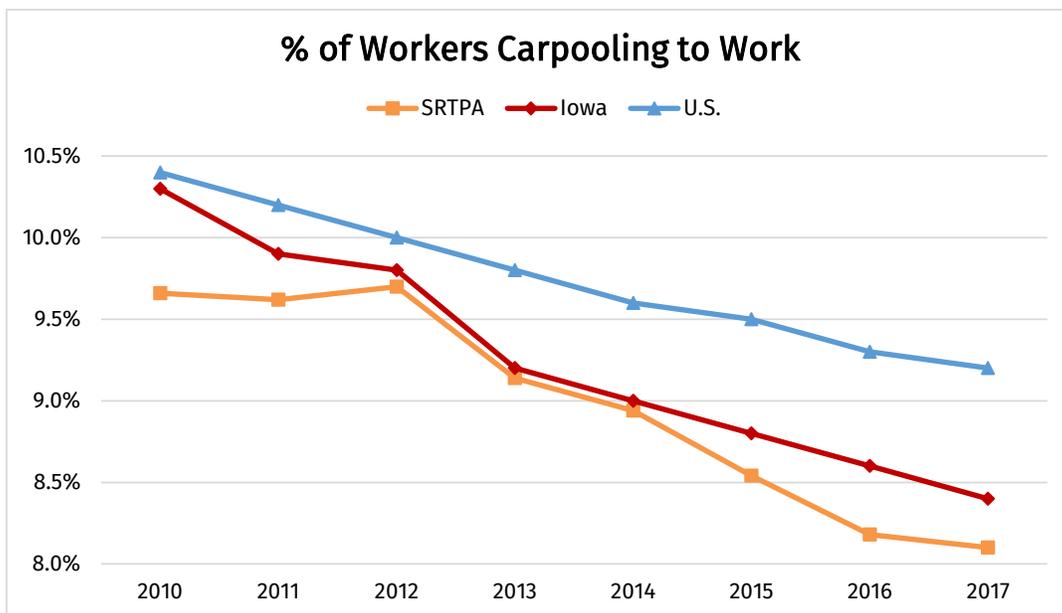
⁴ Iowa in Motion – State Transportation Plan - <https://iowadot.gov/iowainmotion/>

5. Improvements on infrastructure and surrounding infrastructure brings development

The public’s level of comfort in their surroundings and transportation network improve through enhancement infrastructure such as pavement of roads and development of trails and sidewalks. Pedestrian and vehicular traffic can be beneficial to the development of a community. As the degree of accessibility and mobility is increased through additional roads, trails, and sidewalks in a community, new opportunities or expansion of residential and commercial development can be realized.

6. Carpooling

According to the U.S. Census Bureau, the percentage of employees within SRTPA that choose to carpool to work has been less than the state and nation’s average for years, as illustrated in the following graph. Similar to tourism the potential to take measures that lead to a greater share of employees carpooling to work always exists. The rural nature of SRTPA’s counties is an obstacle that will always exist as well. An example of a measure SRTPA could potentially take includes establishing a ride-sharing related program. IDOT has recently established a statewide Park and Ride System that features a series of park and ride facilities allowing individuals to park their vehicles when carpooling, vanpooling, or taking public transit. No park and ride facility is located amongst SRTPA. There are two locations (Monona and Woodbury County) currently under consideration for developing a new park and ride facility within the region. Two additional locations within the SIMPCO MPO are currently under consideration as well.



7. *The expansion of the expressway bypass outside of Le Mars*

In 2007, the Highway 75 bypass outside the city of Le Mars was opened. With the new bypass, the community has an opportunity to benefit economically by adding commercial industries and expanding the existing local transportation network. The bypass was built to redirect the highway traffic outside of the city creating a safer route for both residents and travelers. With commuters on the bypass, the city of Le Mars, may find it attractive to develop businesses around the Highway 75 area. Zoning regulations and strategic planning should be instituted to assist preparing the development but also, the city of Le Mars has an opportunity to improve the infrastructure of the local road network connecting to the bypass. Updating the infrastructure could help draw commuters in from the highway.

8. *State Funding Legislation*

There is an ongoing discussion taking place in the Iowa House of Representatives and the Senate in Des Moines about how and where to obtain additional funding for future infrastructure and maintenance of the existing transportation within the state. It is paramount to pass further legislation to fund the roads. In May of 2008, the TIME-21 (Transportation Investment Moves the Economy in the Twenty-First Century) Fund was created to distribute new funds generated by increasing vehicle fees. Considerations are still in place to scrutinize raising gas taxes to help fund roads, maintain the state's system and accomplish important future projects. The consideration of raising gas taxes contributed to the passage of Senate File 257 legislation. As previously discussed, the raised state fuel tax component of the newly signed law helps combat the funding shortfalls being experienced by the state and communities. TIME-21, Senate File 257, and other legislation have given SRTPA an opportunity to apply for funding to complete essential projects having an impact on local communities. The expansion of Highway 20 to a four-lane road is an example of a project that benefited from the new legislation.

The IDOT recently put out an updated analysis of existing revenue sources and potential revenues sources in their 2016 Road Use Tax Fund (RUTF) Study. The potential revenue sources are not a final recommendation and not part of their legislative proposals but are an effort to receive public feedback on ideas for future funding. The potential revenue sources included in the 2016 RUTF Study include the following: a vehicle registration fee approved and levied at the local level; a one percent sales tax on fuel; a tax collected by the state either based on a percent of value or a volume-based fee on resources extracted from the

earth; a tax based on the vehicle miles traveled within a state; implementing fees to travel on road segments; a fee charged to developers for off-site infrastructure needs that arise as a result of new development; a written promise to repay borrowed money at a fixed rate on a fixed schedule; privatization of infrastructure; fee imposed on containers moving through a designated geographic area; a tax charged on imported oil based on either the volume or value of the imported oil; and a tax on light-duty vehicle tires. The entirety of the potential revenue sources and the advantages and disadvantages associated with each that are included in the 2016 RUTF Study can be viewed in the Appendix.

C. *Transportation Alternatives*

Several of the following transportation alternatives have been already been implemented amongst SRTPA are included to highlight the options county engineers are exercising. Please note the following is a general consensus of alternatives considered by stakeholders to address key needs and issues in the region.

1. *Bridge replacement alternatives*

As Iowa ranks 7th amongst all states in the total number of bridges, replacement of infrastructure can be expensive and time consuming. The use of box culverts is a potential bridge replacement measure to consider. Culverts are small pre-fabricated bridges that are safe, simple to install, low cost, and non-time-consuming. An additional alternative for consideration is constructing bridges on the side of the site and moving the structure into the place of the previous bridge. This means of construction is an effective tool in certain situations and non-time-consuming that results in minimal impact for the users.

2. *Automated Vehicles*

Brainstorming innovative ideas that account for unpredictable weather, aging populations, vehicle operator concerns, and other issues in order to protect all drivers should always be considered. The introduction of automated vehicles being a part of SRTPA's transportation network is a potential reality in the future. There is a general consensus that automated vehicles have the ability to judge what is transpiring in the environment and react accordingly, resulting in a safer transportation environment.

3. Rumble strips

In 2004, IDOT designated shoulder strips as a design standard for paved shoulder construction in rural areas. A potential alternative to raise drivers' awareness is placing rumble strips on the dividing line of a two-lane highway along stretches that are currently designated as a No Passing Zone. This use of rumble strips is intended to reduce the frequency of head-on, sideswipe, and crossing-the-centerline crashes on two-lane and rural highways. In 2003, the Insurance Institute for Highway Safety conducted a study and survey on centerline rumble strips and found that head-on and opposing-direction sideswipe crashes were reduced by approximately 21 percent. Although rumble strips are known to be a safe and effective tool for motor vehicle awareness, they are considered to be a hazard for bicyclists however. To address the reasons on rumble strips being hazardous for bicyclists, IDOT introduced additional alternatives allowing gaps in between stretches of rumble strips allowing bicyclists to cross over the centerlines of roads.

4. Enhanced efforts to improve locations of utility lines

Future transportation-related construction or expansion projects may involve the movement of utility lines if none are present on the project site. Due to the expensive nature of relocating utility lines, an alternative to prevent future displacement is developing a long range plan that features a development system for projects. An example of this long range plan could include estimations on where new projects may occur and where utility lines can be relocated without disturbing the utility network during construction. Widespread access to documentation and mapping of the long range plan is an additional consideration to take.

5. Invoice miles to drivers for wear and tear on the roads

With the increasing urgency to make cars fuel efficient and environmentally friendly, the gas tax is losing revenue. Proceeds of the gas tax facilitate improvements to the roads, but with cars attaining as much as 50 miles per gallon, it is hard to determine with the gas tax which vehicles are putting more wear and tear on the roadways. The idea of frequently assessing vehicles using Iowa's roads is currently being tested in eastern Iowa as well as other parts of the country. Simply put the state could "bill miles" to drivers based on how much and where individuals are driving by tracking miles with some form of a GPS device. In order to succeed, the concept must be simple. People do not need the extra complication of tracking their miles while driving their vehicles and many may balk at the notion of "being tracked".

6. 4-to-3-Lane Conversions

With the potential of increased ridership and growing population, SRTPA will have to accommodate the potential changes to their transportation network. An alternative to address the potential changes features the conversion of a 4-lane road into a 3-lane road to increase the utilization and efficiency of the roadway for the traveling public. Reallocating this space in the right locations has been shown to increase the safety and operation of the corridor. In many cases the reallocation of space has provided municipalities an opportunity to grow their network of bike and pedestrian infrastructure and/or align with existing complete streets.

II. Summary

The transportation threats, solutions, and alternatives outlined within SRTPA support coordination among government entities and the public, promote improvements to current and new infrastructure, and encourages legislation creating adequate funding sources allowing the improvements described possible.