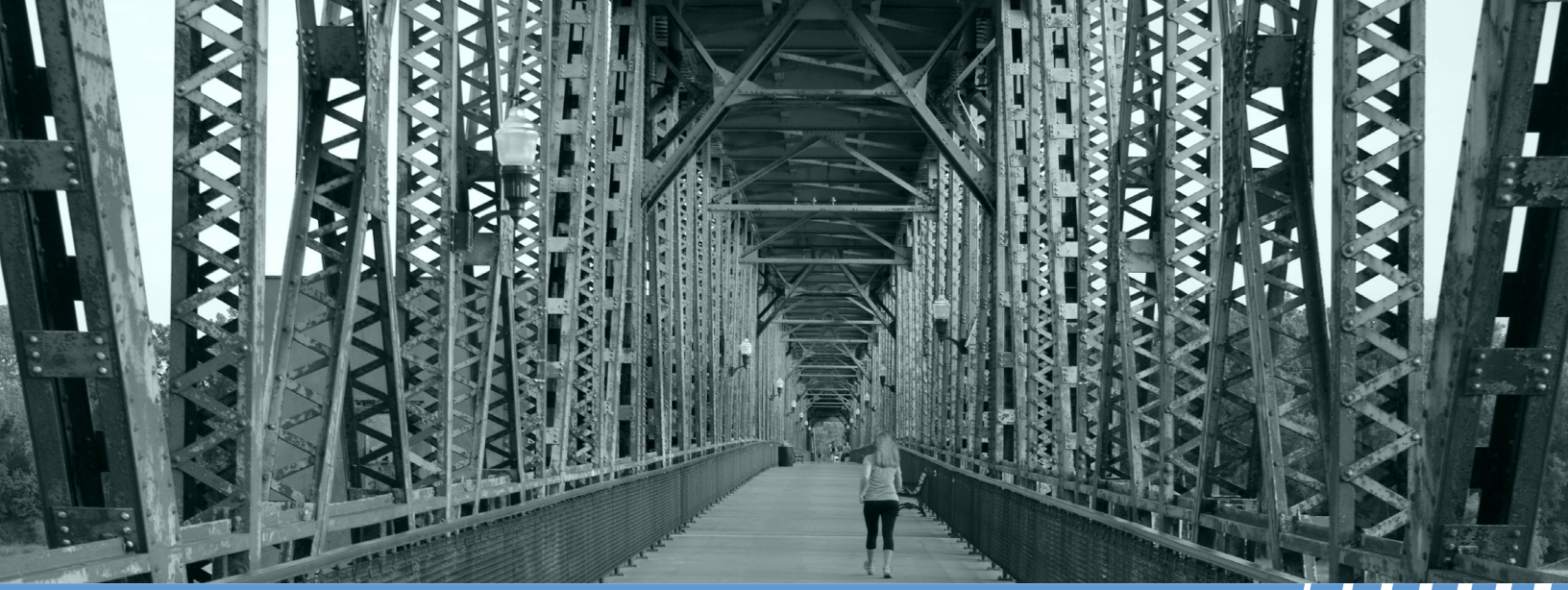

YANKTON COUNTY
MASTER TRANSPORTATION PLAN

May 2015

The South Dakota
Department of Transportation
in Conjunction with
Yankton County

SRF
Consulting Group, Inc.

FHWA Disclaimer

The preparation of this report has been financed in part through grant(s) from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation, under the State Planning and Research Program, Section 505 of Title 23, U.S. Code. The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

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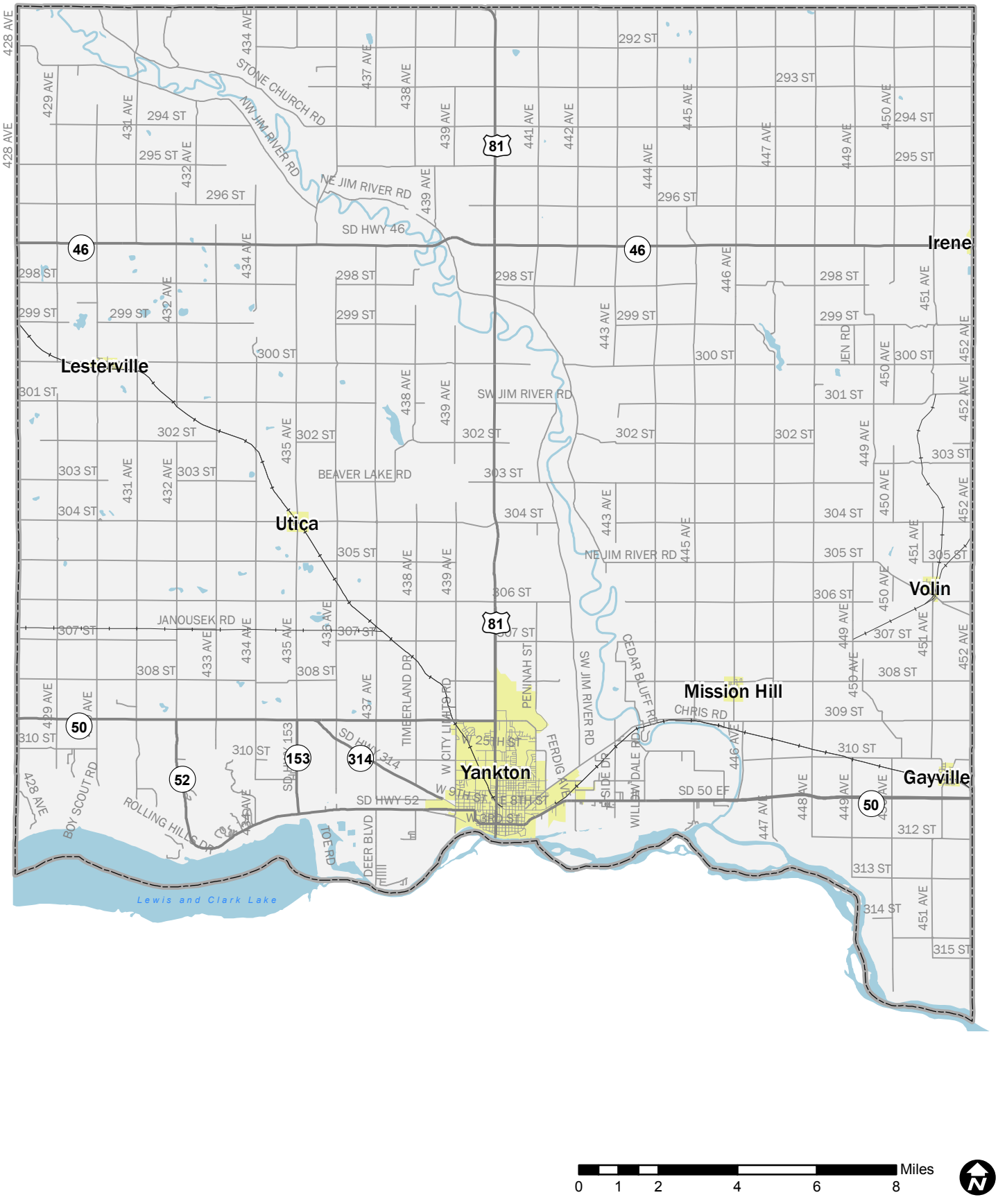
Introduction and Purpose

The Yankton County Transportation Master Plan has been prepared to guide the development of the county's transportation system over the next 25 years. It is the product of a year-long study led by Yankton County and the South Dakota Department of Transportation (SDDOT). Throughout the process of creating the plan, key stakeholders and other members of the community were consulted to help identify critical transportation issues in the county and develop strategies to address those issues.

The Transportation Master Plan addresses all components of Yankton County's multimodal system, focusing primarily on automobile, heavy commercial vehicle, and non-motorized transport. The study area appears in **Figure 1**.

The remainder of this document details the county's collective goals, identified issues, potential strategies for addressing issues, project costs, and the available program budget. The document concludes with a series of recommendations for how the county can best meet the diverse needs and desires of its residents and workers through targeted projects, policies, and programs. It is recommended that this plan be reviewed and updated at least annually to keep the project list current and to advance priorities as funding becomes available.



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Yankton County Transportation Master Plan Study Area

YANKTON COUNTY MASTER TRANSPORTATION PLAN

Figure 1

Transportation System Goals

Establishing goals is the first step toward developing a collective vision for Yankton County's transportation system from the many distinct desires of its individual residents, business owners, workers, and visitors. This visioning process helps identify a shared endpoint that the transportation master plan can aim for with its recommended policies and projects.

Since significant effort was put into previous planning endeavors, including the Yankton County Draft Subdivision Ordinance (2.19.2014) and the Yankton County Comprehensive Plan (9.16.2003), goals established in those projects were used as a starting point for the goals established herein. Goals were vetted and finalized through meetings of the Study Advisory Team (SAT).

A view of Lewis and Clark Lake from State Highway 153/435th Avenue

Transportation System Goals

The following goals frame the issues raised by local stakeholders and guide the development of strategies to address the county's needs. They are far-reaching, generalized statements of intent.

Safety

Develop and maintain a transportation system that provides for the safe and convenient travel of all types of users, regardless of transportation mode.

Economic Strength

Ensure the transportation system effectively moves people and goods in support of Yankton County's diverse industries.

System Preservation

Maintain the transportation system in a state of good repair in a fiscally sustainable manner.

Livability

Preserve the rural feel of the county through transportation policies that encourage responsible growth.

Fairness

Provide transportation service equitably to users throughout Yankton County.

Environmental Health

Ensure that transportation facilities are developed and maintained in a manner that is sensitive to the natural environment.

Coordination

Work with neighboring jurisdictions and other levels of government to coordinate transportation system improvements and maintenance across jurisdictional boundaries.

One of the many gravel roads serving Yankton County's agricultural areas

Existing Conditions

Demographics

Yankton County is home to 22,438 people. Most of the population is concentrated in the city of Yankton, which has a population of 14,454. The county's population grew 3.6 percent between 2000 and 2010, increasing from 21,652 residents in 2000. On average, Yankton County residents enjoy a relatively short commute to work of only 15 minutes. As seen in **Table 1**, Yankton County's average commute time is less than that of neighboring Bon Homme and Clay Counties, as well as that of South Dakota as a whole. Yankton County's population is approximately the same age as neighboring Bon Homme County and slightly older than that of the state as a whole. Its median age is roughly 41 years old, compared with 37 for the state. Neighboring Clay County has far younger median age of 25 years due in large part to the presence of The University of South Dakota in Vermillion.

Table 1. Yankton County Demographics

	Yankton County	Bon Homme County	Clay County	South Dakota
Total Population*	22,438	7,070	13,864	814,180
Median Age*	41.3	43.1	25.0	36.9
Mean Travel Time to Work (min.)**	15	18	17	17
Area (sq. mi.)	532	581	417	77,237
Population Density (people per sq. mi.)	42	12	33	11

Source: *2010 US Census; **2012 Five-Year American Community Survey

Land Use

Land use is the primary driver of travel demand and patterns. The location, type, and intensity of development dictate the locations of and routes between people's origins and destinations. The primary land use in Yankton County outside Yankton is agriculture. As of 2003, the year the most recently approved comprehensive plan was completed, agriculture made up approximately 79 percent of the county's land.[1] The most recent land use

[1] Yankton County is currently in the process of updating its comprehensive plan.

map appears in **Figure 2**. Residential and commercial development extends into the County's jurisdiction in greatest concentrations along the SD 50 and SD 52 corridors on either side of Yankton, but is also clustered in the smaller communities scattered throughout the county. Public lands primarily include areas near Lewis and Clark Lake as well as the Missouri River.

Agricultural uses generate lower levels of traffic than other land uses, but the traffic is often composed of larger, heavier vehicles that place greater wear and tear on roads, especially gravel roads. Commercial land uses generate higher levels of traffic from a variety of vehicle types, while residential generation rates fall in between and tend to mainly be personal automobile traffic.

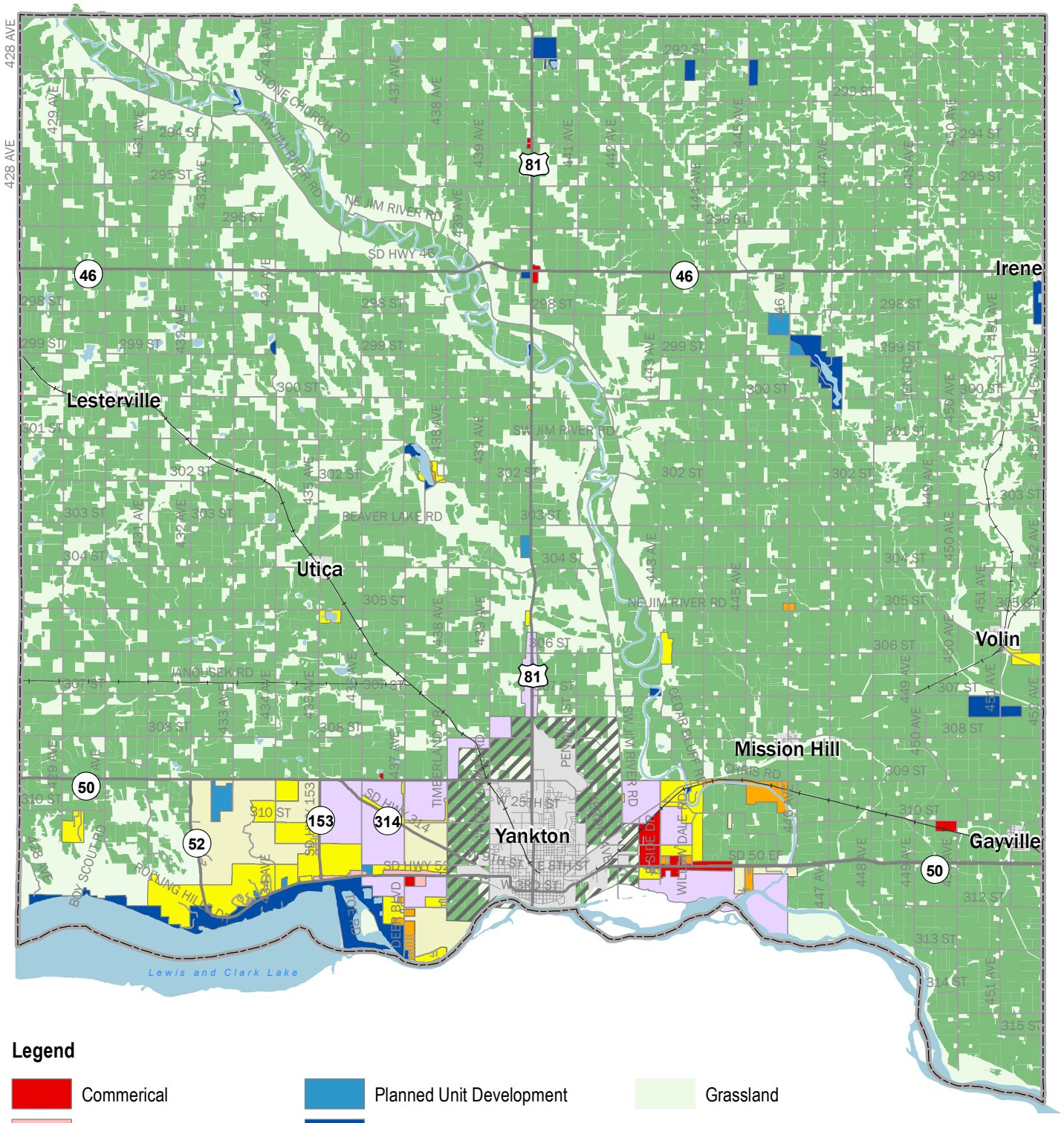
The 2003 Comprehensive Plan identified continued residential development primarily in three townships – Ziskov-South, Utica-South, and Mission Hill-South – which has largely been where growth has occurred outside of Yankton's city limits since that time.

Environmental

Yankton County's rivers and topography hinder the connectivity of the county's transportation network. The Missouri River along the southern edge of the county limits direct access to Knox and Cedar Counties in Nebraska to three points: US 81 over the Discovery Bridge, Crest Road over Gavins Point Dam, and non-motorized access over the Meridian Bridge.

The James River cuts through Yankton County, and its wide flood plain and meandering route make traversing it with bridges costly. There are currently seven crossings of the James River in Yankton County, four of them supporting roads under county jurisdiction.

Crossing of James River along 436th Avenue



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Land Use

Figure 2

The majority of the areas in the county identified by the Federal Emergency Management Agency (FEMA) as at risk of flooding lie along the James River and Beaver Creek in rural parts of the county, as well as Marne Creek within Yankton. The 100-year floodplain can be seen in **Figure 3**.[2]

Steep slopes can also limit the connectivity of the road system, especially in the western half of the county and along the James River. While roads can often be built across steep slopes, benefits are often outweighed by the high costs and potential for environmental impacts.

Motorized Travel on Streets and Roadways

Jurisdiction

Roadways within Yankton County are assigned jurisdictional classifications to define the regulatory, maintenance, construction, and financial obligations of each of the governmental units operating in the county.

Figure 4 displays the roads in Yankton County along with their jurisdictional classifications. The four primary classifications are State, County, Township, and Municipal. Roads with the classification "Other Administration" include privately owned roads that serve rural residential areas as well as roads serving the Lewis and Clark Recreation Area and Gavins Point Dam.

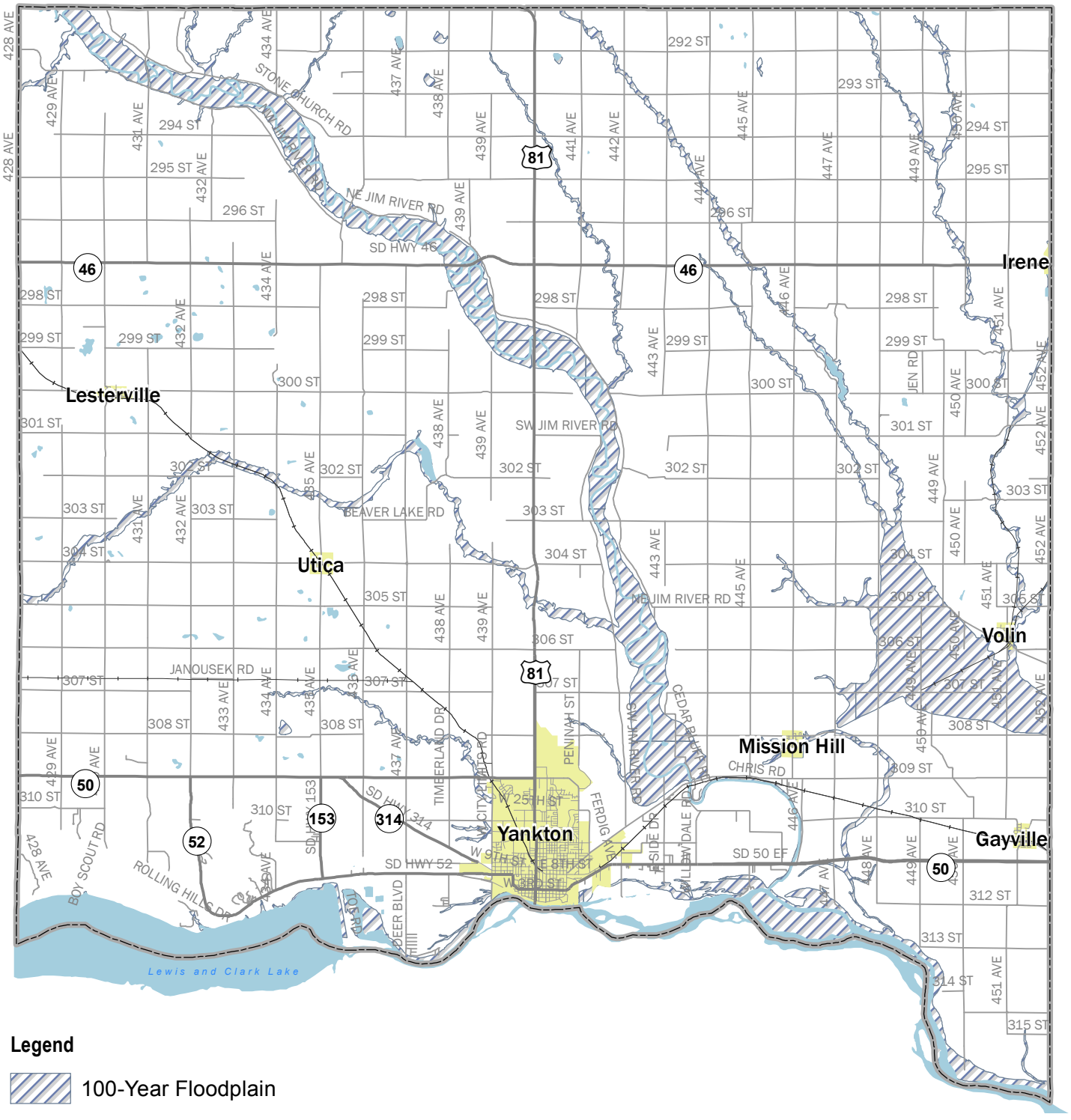
Table 2 presents the mileage of roads under each level of jurisdiction along with their functional classifications. While the Yankton County Master Transportation Plan primarily deals with the county road system, it also considers the interaction between county roads and roads under other jurisdictions.

The South Dakota Department of Transportation (SDDOT) maintains the portions of the state highway system present in Yankton County. These roads include US Highway 81, SD Highway 46, SD Highway 50, SD Highway 52, SD Highway 153, and SD Highway 314.

Route Designation

Yankton County organizes its classification system in the form of primary and secondary routes. Primary roadways provide a high degree of connectivity to other primary roadways along with the state routes. They are

[2] Additional information on the FEMA floodplains can be found at https://msc.fema.gov/.



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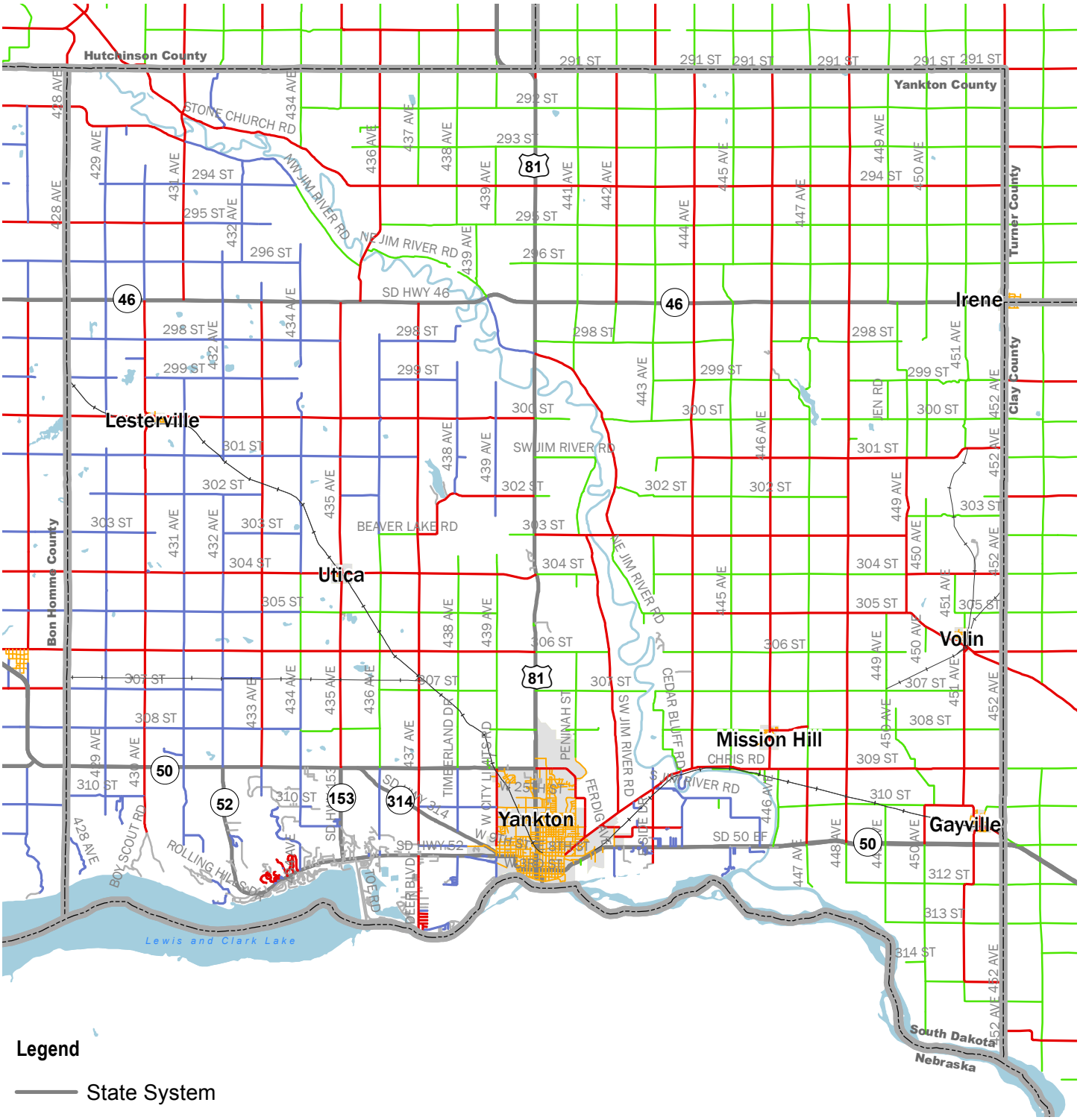
100-Year Floodplain

Figure 3



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Jurisdictional Classification

Figure 4

Table 2. Mileage by Functional Classification and Jurisdiction

Functional Classification	Jurisdiction*	Mileage
Rural Principal Arterial	State	50
Rural Minor Arterial	State	33
Rural Major Collector	State	6
	County	167
	City	<1
Rural Minor Collector	County	37
Rural Local Roads	County	290
	Township	330
	City	12
	Other	60
Urban Principal Arterial	State	7
Urban Minor Arterial	State	2
	County	3
	City	10
Urban Collector	County	2
	City	9
Urban Local Street	County	3
	Township	1
	City	56
	Other	2

Note: "Other" jurisdiction typically refers to privately owned roads or roads under the US Army Corps of Engineers jurisdiction.

designed to handle heavier weights than secondary roads and are often paved because of higher traffic volumes. Secondary routes are used primarily to provide access to homes and agricultural land in rural areas. Much of the secondary mileage exists in the unorganized townships (comprised of Odessa, Lesterville, Central, and Ziskov Townships), as the county fills the role provided by the townships in the other areas.

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secondary mileage exists in the unorganized townships (comprised of Odessa, Lesterville, Central, and Ziskov Townships), as the county fills the role provided by the townships in the other areas.

Figure 4 shows those roadways in Yankton County that are considered primary and secondary routes.

Federal Functional Classification

The federal functional classification system defines the purpose and role of roadways within the hierarchy of the overall roadway system. It is a planning tool based on the concept that roads that serve different functions require different design considerations. A road's classification helps define potential funding sources, and physical characteristics. The overall goal of functional classification is to create a network of roads with the connectivity and capacity necessary to efficiently move people and goods within the county and beyond.

A roadway's federal functional classification is based on two principal factors:

- Access Provided – The primary purpose of a local street is to provide access to abutting properties. Principal arterials, on the other hand, are generally designed to limit access points, as providing direct access is not a high priority.

- Mobility – In general, a road's mobility is measured by the length of a trip that is supported by the corridor and what it connects. Arterial roads should provide the highest level of mobility, thus supporting longer distance trips and connecting communities or more intense travel generators. Local streets should limit the length of trip supported and provide connectivity to only minor trip generating uses (single homesteads).

  Collector Routes reflect a mix of access and mobility, supporting a balance of both.

State highways are designated as principal or minor arterials in Yankton County. Roads under county jurisdiction are split into major and minor collectors. Major collectors in Yankton County are paved, as they are designed for heavier vehicle traffic than local roads, but their design is also meant to funnel longer-distance traffic to arterial routes. Minor collectors in rural areas of the county are also typically paved, providing access to the network of local roads under township and county jurisdiction. These roadways are maintained to a level so that farm equipment and agricultural products can be moved efficiently across rural areas.

By maintaining and periodically updating the county's functional classification system, local agencies and planning officials are able to design and maintain roadways in support of their intended functions. The formal process of determining urban and rural functional classification is outlined in FHWA's manual, Highway Functional Classification – Concepts, Criteria and Procedures, 2013.

The federal functional classification of Yankton County's roads appears in **Figure 5**.

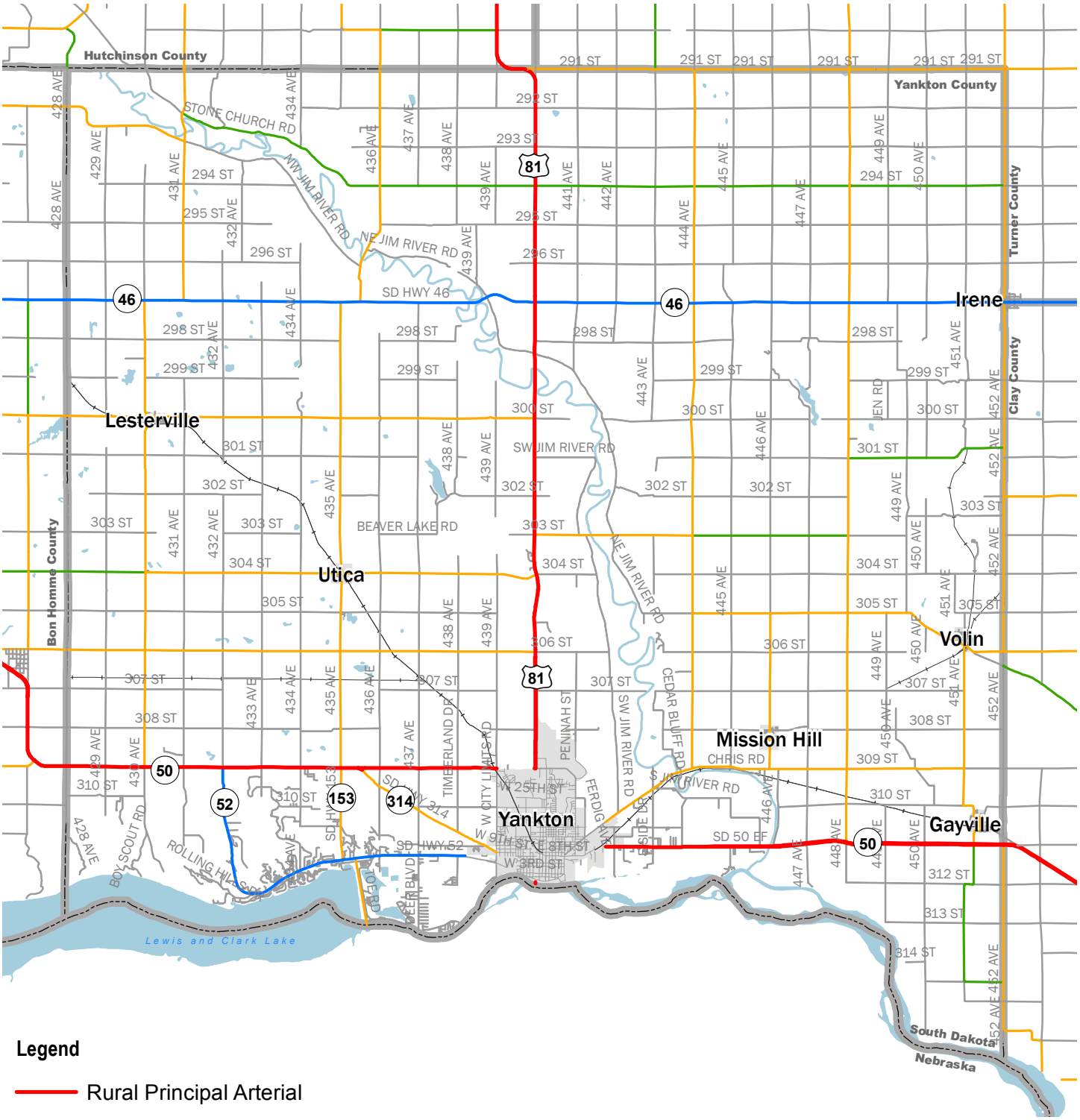
Federal Aid Routes

The Federal Aid System (FAS) was a historic system utilized to direct federal funding to roadways across the nation. Routes were designated as FAS for a variety of reasons independent of the roadway jurisdiction. This system is no longer used to direct federal funding. Instead, the federal functional classification of an individual roadway is used. However, roads that were designated as FAS routes were grandfathered into the federal system and remain eligible for federal spending regardless of federal functional classification.

Roadway Surface Type

The Yankton County Highway Department is responsible for just over 500 miles of roadway. Approximately half of the miles are paved (252 miles), and half of them are unpaved/gravel (249 miles). Along these miles, the county is responsible for all aspects of roadway maintenance, including repair, signage, and snow removal. **Figure 6** shows the surface type of the roadways in Yankton County.

Asphalt and Gravel Roads in Yankton County



Legend

- Rural Principal Arterial
- Rural Minor Arterial
- Rural Major Collector
- Rural Minor Collector
- Rural Local Roads

0 1 2 4 6 8 Miles

Federal Functional Classification of Roads

Figure 5

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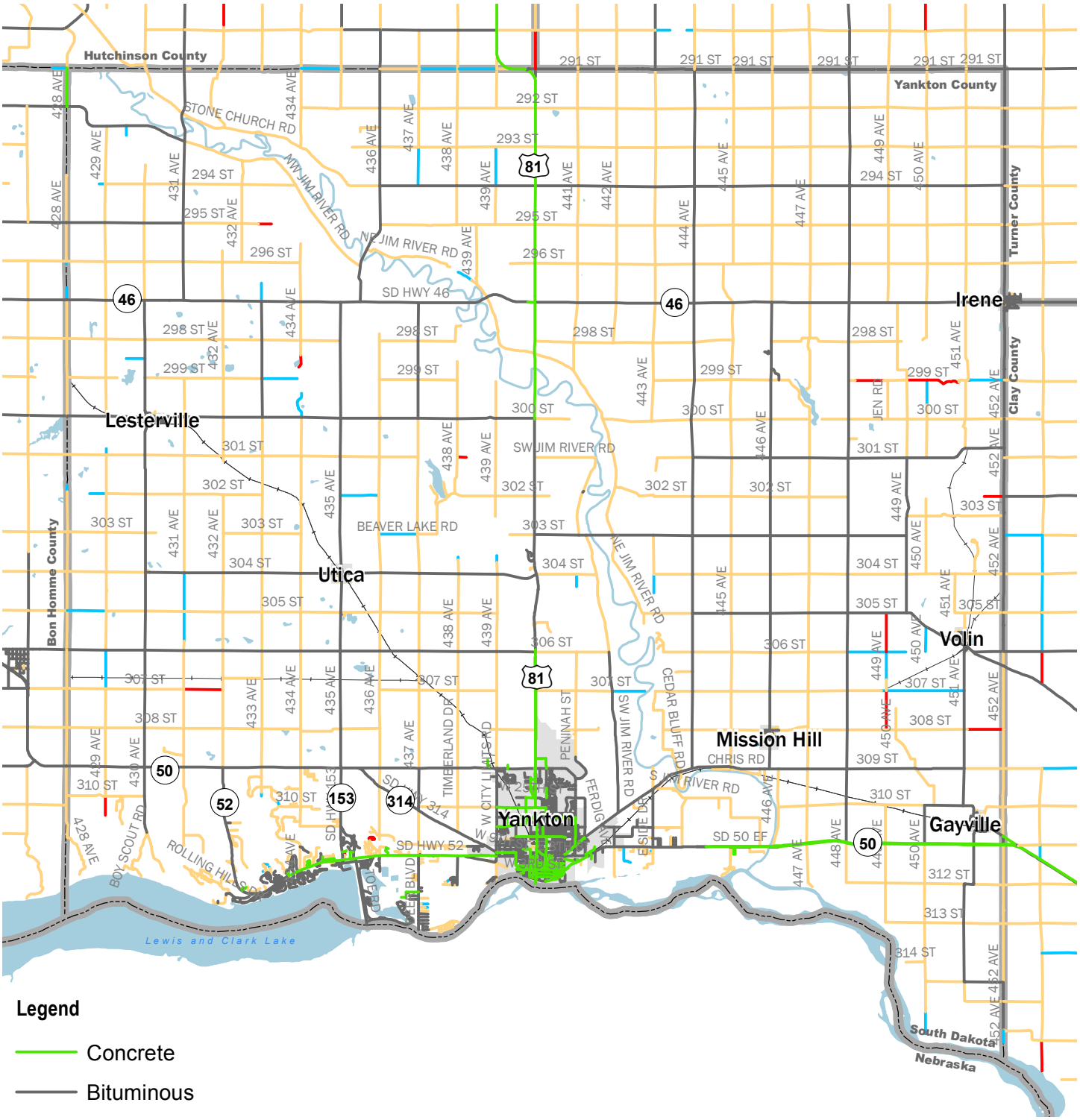

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Road Surface Type

Figure 6

As traffic increases on gravel roadways, the costs of ongoing maintenance begin to surpass the costs of paving the road, so upgrading the surface type becomes the cost-effective course of action.

Truck Routes and Seasonal Weight Restrictions

In the spring, the county places load restrictions of seven tons per axle on all of the asphalt roads under its jurisdiction to protect them from damage when the ground is soft due to thawing and precipitation. These weight restrictions are of particular concern to the agricultural community who need to haul commodities on a tight schedule in the spring. They also impact the economic strength of the smaller communities in the county by preventing consistent access for heavy commercial vehicles throughout the year. Roads with seasonal weight restrictions appear in **Figure 7**.

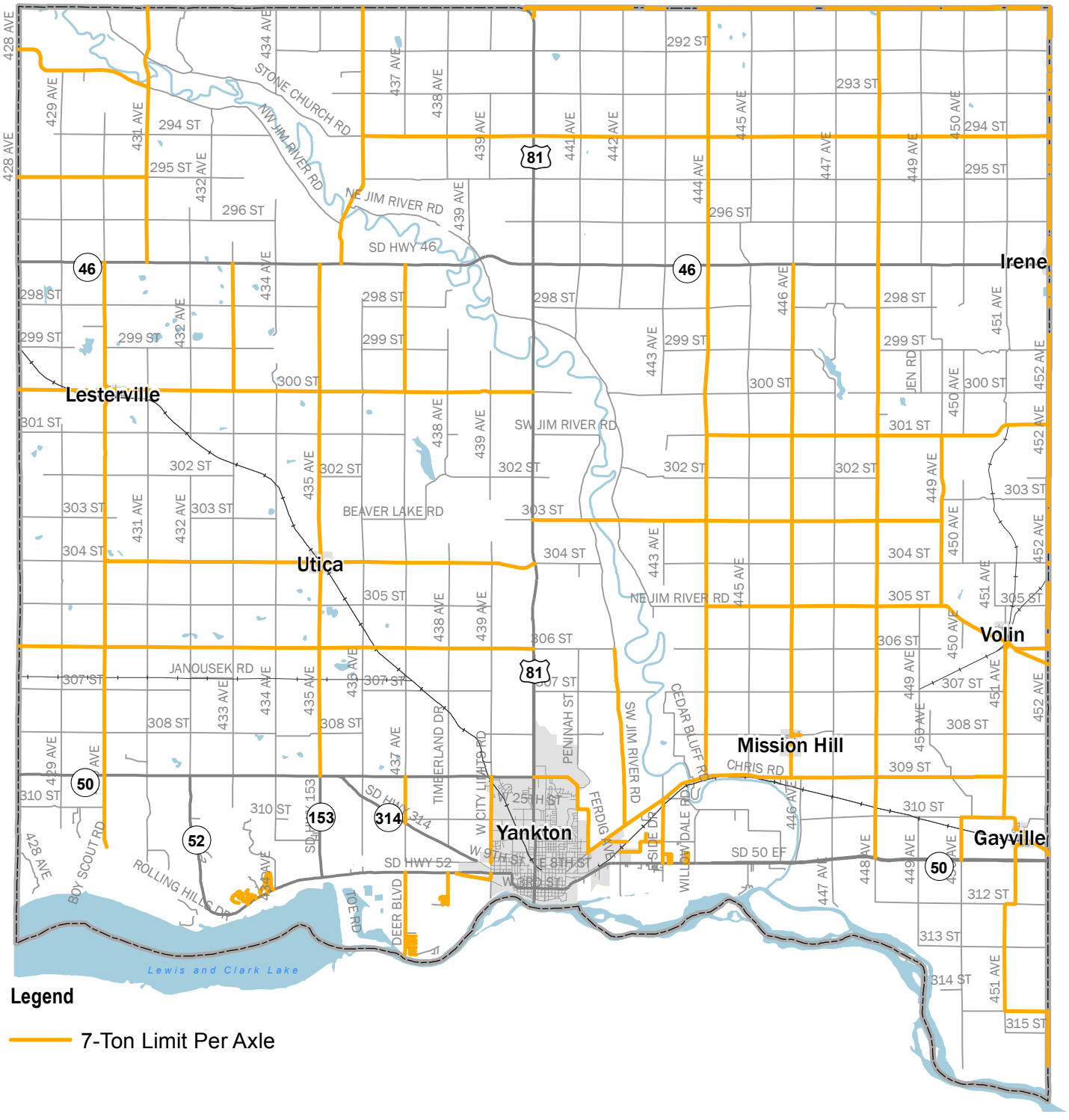
Bridges and Culverts

Yankton County has jurisdiction over 76 roadway structures, 28 of which are on township roads. By law, Yankton County is responsible for the replacement of bridges and culverts with openings greater than 16 square feet, regardless of whether they are located on county or township roads. The 76 structures are comprised of 70 bridges and six culverts. **Figure 8** shows the locations of these structures as well as their ages as of 2014. The average structure is 24 feet wide, 61 feet long, and was constructed in 1962.

Bridge over James River along 303rd Street

The typical useful lifespan for a bridge is approximately 75 years. While 75 years is the typical useful life of a bridge, it's important to consider that age does not automatically lead to the conclusion that a bridge needs to be replaced. There are many other factors the county and state consider when determining the structural integrity of a structure:

- Structural adequacy and safety.
- Serviceability and functional obsolescence.
- Suitability for continued use.



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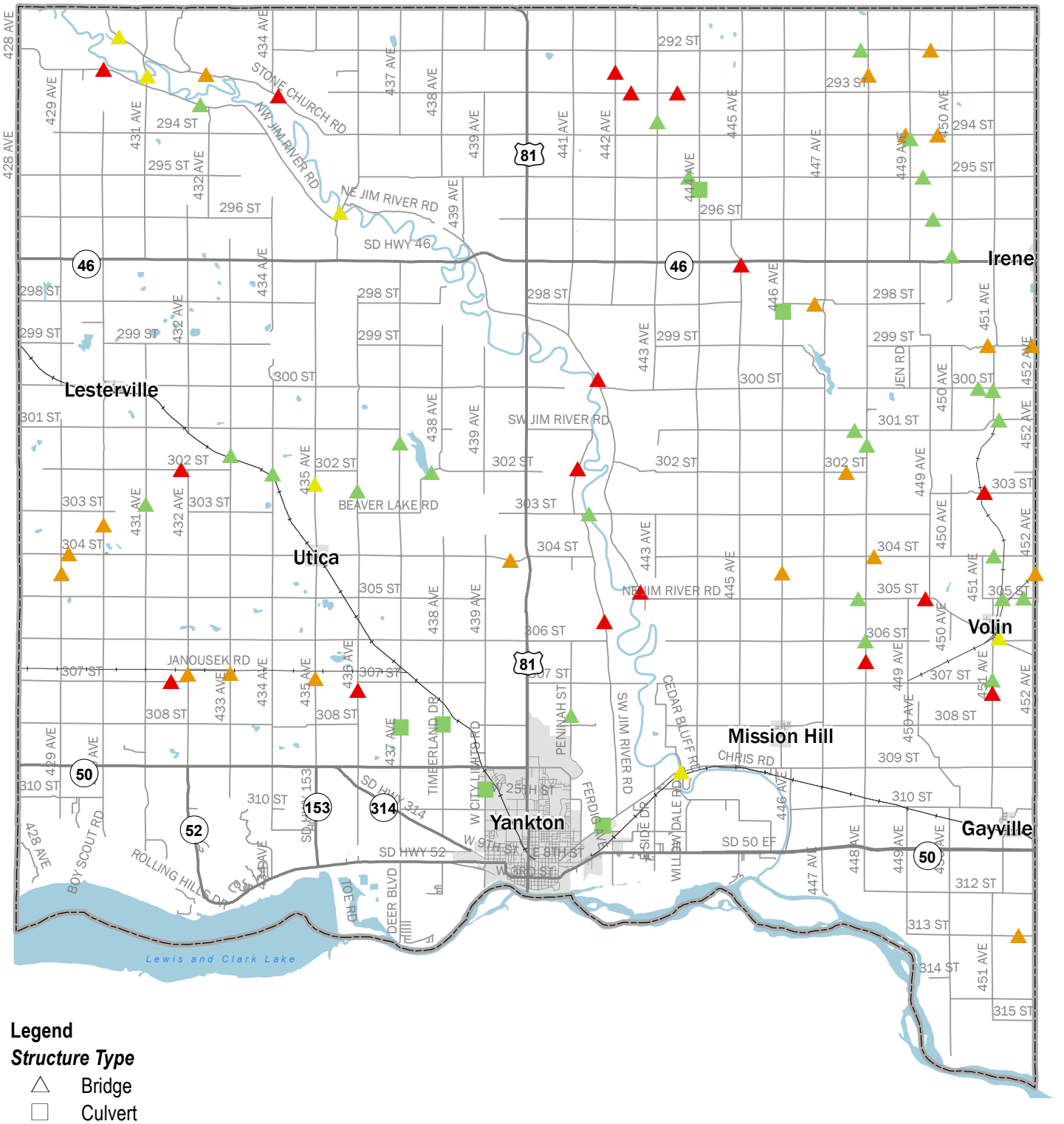
Spring Weight Restrictions

Figure 7



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Location and Age of Structures

Figure 8

The 75-year age measure is simply used to estimate when bridges might need to be considered for significant rehabilitation or replacement for budgeting purposes. As seen in **Figure 8**, 17 bridges under County jurisdiction are currently at least 75 years old.

Bridge over Creek along 438th Avenue

Structures are inspected every two or four years and assigned federal sufficiency ratings ranging from zero to 100, with 100 being the best. The average sufficiency rating of structures in Yankton County is 70.6. A lower sufficiency rating does not mean that a bridge or culvert is structurally unsound or unsafe to use. Low ratings can indicate non-structural issues such as narrow width or a curved approach road. However, a low rating can be a sign that replacement or repair will be needed at some point in the coming years. An inventory of county structures can be found in *Appendix B*.

Traffic Volumes and Congestion

An important part of planning for future transportation investments is to understand how existing roads are currently being used. Outside of Yankton's city limits, most roads under the county's jurisdiction carry relatively lower amounts of traffic. The majority of rural traffic is concentrated on the state highway system, and people primarily use County roads to access individual properties or travel to portions of the county lacking close access to the state routes. There are several instances, however, where a county road or series of roads are used as alternatives to state highways. The following have been identified as issues to address:

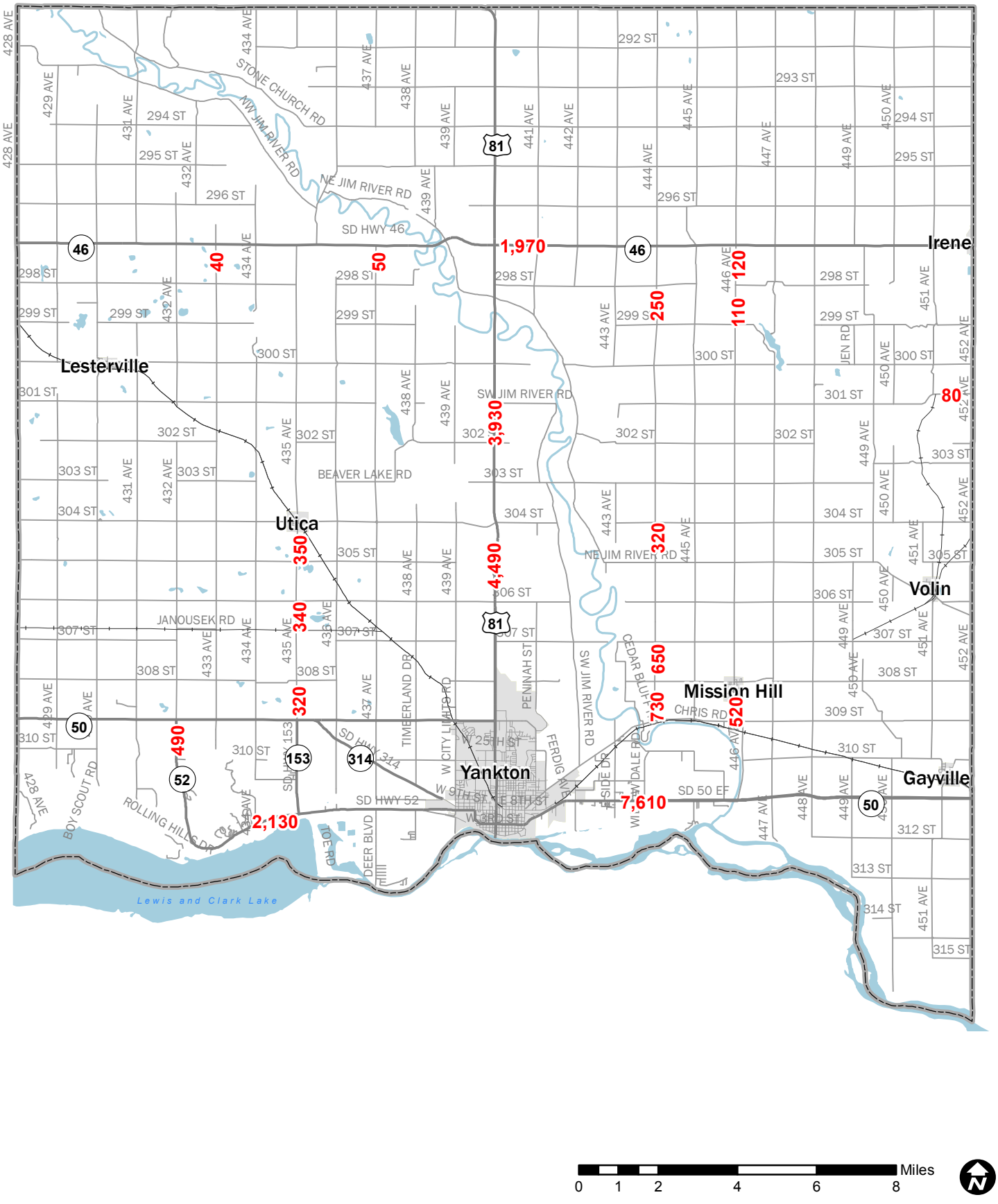
- 435th Avenue – The road is being used as an alternate to US 81 when it is known the port-of-entry is open. There is concern that 435th Avenue is used by heavy commercial vehicle drivers as a way to avoid the port-of-entry weigh station.
- Recreational Vehicles – During summer peak travel months, there is concern that persons traveling to recreational destinations west of Yankton use county routes (such as 435th Avenue) to bypass Yankton and avoid delays in town.

However, the County roads are sometimes used as a way for vehicles carrying recreational or commercial loads to avoid the traffic of the state routes.

Figure 9 displays the annual average daily traffic (AADT) for select roads in Yankton County as collected by the South Dakota Department of Transportation (SDDOT) and Yankton County in the summer of 2014. The highest traffic volumes are on state highways at points closest to Yankton. Of the County roads, 444th and 446th Avenues have the highest traffic counts, though both remain well below 1,000 vehicles per day. Many of the county's roads have traffic volumes well under 100 vehicles per day.

Traffic along SD 46 East of US 81

Few County roads carry over 500 vehicles per day, and none of them carry over 1,000 vehicles per day. The majority of County roads are two-lane undivided rural facilities that would be considered congested when daily traffic approaches 5,000 vehicles. Based on this threshold and current traffic, congestion is negligible along the county system. Additionally, there are no state routes in county currently approaching daily capacity. Segments of the state system carrying more than 5,000 vehicle per day are presently constructed as four plus lane facilities, with a higher capacity.



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2014 Average Annual Daily Traffic (AADT)

Figure 9

Transportation Safety Analysis

A central goal of any transportation system is to allow users to get to/from where they want to be in and do it safely. Data from the most recent three-year period available was analyzed to better understand roadway safety issues in Yankton County. **Figure 10** displays the locations of crashes occurring in Yankton County from 2011 through 2013. The map divides crashes into two groups: those that took place within 150 feet of an intersection and those that took place between intersections.[3] Most crashes occurred on the state highway system, and a majority of those were animal hits between intersections. The highest concentration of crashes at any one intersection was five, and only the following nine intersections had more than two crashes:

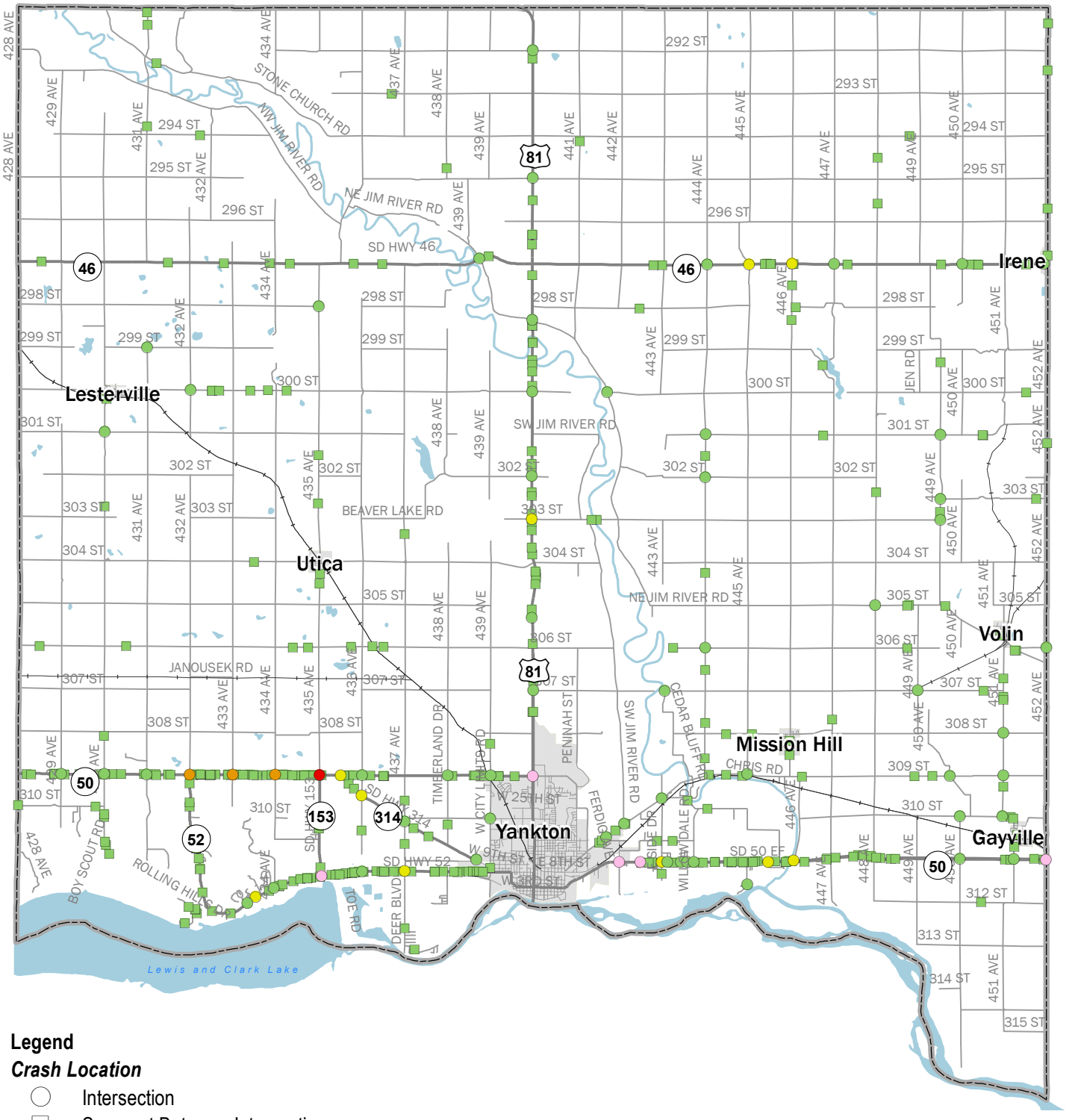
- SD 50/SD 153 (435th Avenue) - 5 crashes
- SD 50/432 Avenue - 4 crashes
- SD 50/433rd Avenue - 4 crashes
- SD 50/434th Avenue – 4 crashes
- SD 52/SD 153 (435th Avenue) - 3 crashes
- SD 50/US 81 - 3 crashes
- SD 50/Bill Baggs Road - 3 crashes
- SD 50/Chevy Street – 3 crashes
- SD 50/452nd Avenue (County Line Road) - 3 crashes

The following bulletpoints provide a summary of the crashes in the three-year period:

- Total crashes – 479.
- Animal hits were the most prevalent, representing 286 crashes (60 percent of the total number).
- Crashes on county routes -179 (37 percent of all crashes).

Due to the relatively low number of crashes on county roads, crash rates were not estimated for this evaluation. Study areas with lower traffic volumes and a small number of crashes can have crash rates that vary significantly with the addition or absence of a single occurrence. Thus, this evaluation was based on crash frequency rather than rates. The distribution of crashes across the county system does not indicate the presence of any "hot spots" requiring targeted action.

[3] Crashes that occurred at the intersection of state or county roads and privately owned roads were classified as segment crashes rather than intersection crashes.



Legend

Crash Location

- ○ Intersection
- □ Segment Between Intersections

Number of Crashes

- 5
- 4
- 3
- 2
- 1

0 1 2 4 6 8 Miles

N

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Crashes from 2011 through 2013

Figure 10

Intersection of SD 50 and SD 153/435th Avenue

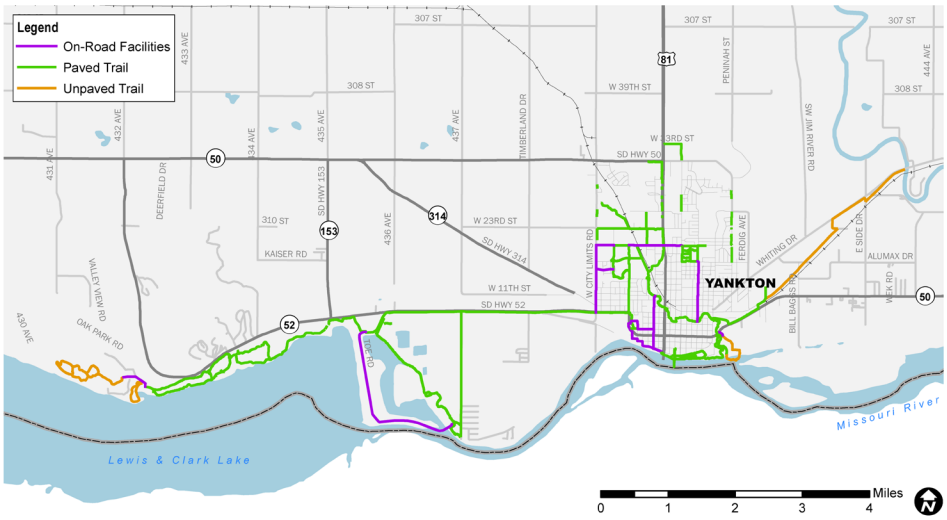
Non-Motorized Transportation

Yankton County has over 50 miles of multiuse trails and on-street bicycle facilities. Approximately half of these existing facilities are within Yankton, and most of the remaining half is west of Yankton near the Lewis and Clark Recreation Area. Facilities within the City of Yankton are described in *The Yankton Plan* (2003), Yankton's most recent comprehensive plan. *The Yankton Plan* also provides guidance for the extension of off-street trails, on-street facilities, and sidewalks throughout the city. As Yankton County extends its non-motorized system, it should remain aware of the city's efforts to ensure that city and county facilities connect to form an uninterrupted network. City and county wayfinding signage should also be coordinated to ensure fluid navigation of people traveling by non-motorized means through both jurisdictions. **Figure 11** displays existing trails and bicycle facilities.

Video collected as part of the plan showed bicyclists using many roads currently lacking bicycle facilities or paved shoulders. By state law, bicycles are defined as "vehicles" and are allowed on all roadways unless specifically prohibited.[4]

[4] See South Dakota § 32-20 for more on state regulations specifically addressing bicycle use.

Figure 11. Existing Bicycle Facilities and Multiuse Trails in Yankton County



Person on a Bicycle near 446th Avenue and 298th Street

Passenger Transportation Services

Yankton County does not currently have transit service outside of the city of Yankton. Yankton Transit, administered by River Cities Public Transit, provides demand-response service within and just beyond city limits.[5] It operates 12 vehicles and provided over 130,000 trips in 2012. Of those trips, approximately 63 percent were for educational or employment purposes. Fares are two dollars per boarding for the general public and a suggested donation for seniors.

[5] Information on Yankton Transit and River City Cab comes from the *Yankton transit coordinated transportation plan – final report*. 2014.

Yankton Transit has goal of "Increase and improve accessible services for individuals with disabilities and other adults."[6] As a first step toward achieving this goal, Yankton Transit is considering contracting with the local private taxi company, River City Cab, to provide service outside the agency's normal service area.

River City Cab currently offers service to anywhere within a 300-mile radius of Yankton. The company operates 24 hours per day, but cannot accommodate people with wheelchairs. Presently, 90 percent of its business is within Yankton city limits.

The nearest intercity bus service operates out of Vermillion.

Freight

Freight moves through Yankton County by both truck and rail. Freight moving by truck typically includes agricultural products, manufactured goods, and mined gravel. The heavy weight of some of these products puts significant wear on the county's road system, particularly trucks carrying material originating from areas not adjacent to the more durable state highways. Most of the mileage under county jurisdiction is not designed/ constructed to regularly accommodate heavy commercial vehicles. Thus, use of county routes (paved or gravel) is encouraged to be limited to between the trip origin/destination and the nearest state highway (US 81, SD 46, SD 50, SD 52 or SD 153). Cross county freight movement should not occur on the county system, but rather it should be directed to a state route.

Yankton County has two rail lines running through it, one active and one inactive. The active railway is owned and operated by BNSF and cuts through the county east to west. The line was part of the state-owned Core railway line, before BNSF bought it in 2006. It runs through Gayville, Yankton, Utica, and Lesterville and carries approximately six-to-ten trains per day.[7] The currently inactive line is owned by that State of South Dakota and is under contract for operation by Dakota Southern. Industrial development opportunities discussed for the Napa Junction area or further west in Bon Homme County could bring the rail back to active status. As part of the sale of Core to BNSF, the Dakota Southern line is guaranteed access to regional rail hubs using the BNSF rail line for 50 years from the date of sale.

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[6] Source: Yankton Transit (2014). *Yankton transit coordinated transportation plan – final report*..p 42.

[7] Source: South Dakota Department of Transportation (2014). *South Dakota state rail plan*, Chapter 3.

Air Service

Yankton County is served by the Chan Gurney Municipal Airport on the north end of Yankton. The City of Yankton owns the airport. There are 41 aircraft based at the two-runway airport, and 98 percent of activity there is classified as general aviation (2012-2013).[8] Commercial service is available in Sioux City and Sioux Falls.

Issues and Opportunities

Mapping Exercise

The identification of issues impacting transportation in Yankton County was an early and essential component of the plan making process. To identify and gain insight into the state of the transportation system, the project team reached out to elected officials, agency staff, residents, economic development agencies, transit operators, school districts, and public safety officials. Issues were identified and prioritized at a project kick-off public meeting held on June 16, 2014, a stakeholders committee meeting, and two study advisory team meetings. Opportunities to provide input were offered through exercises at the meetings, mail-in comment forms, or email messages. *Appendix C* includes a summary of the public meeting.

Issue identification at a public meeting

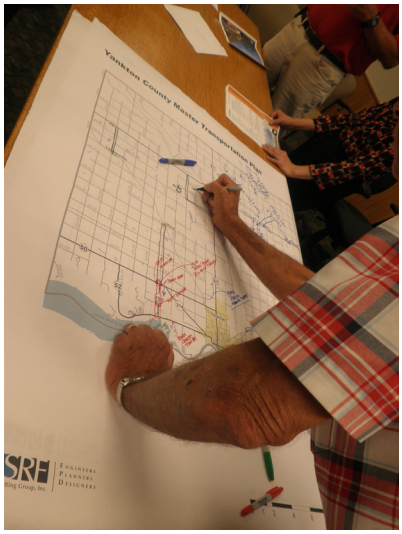
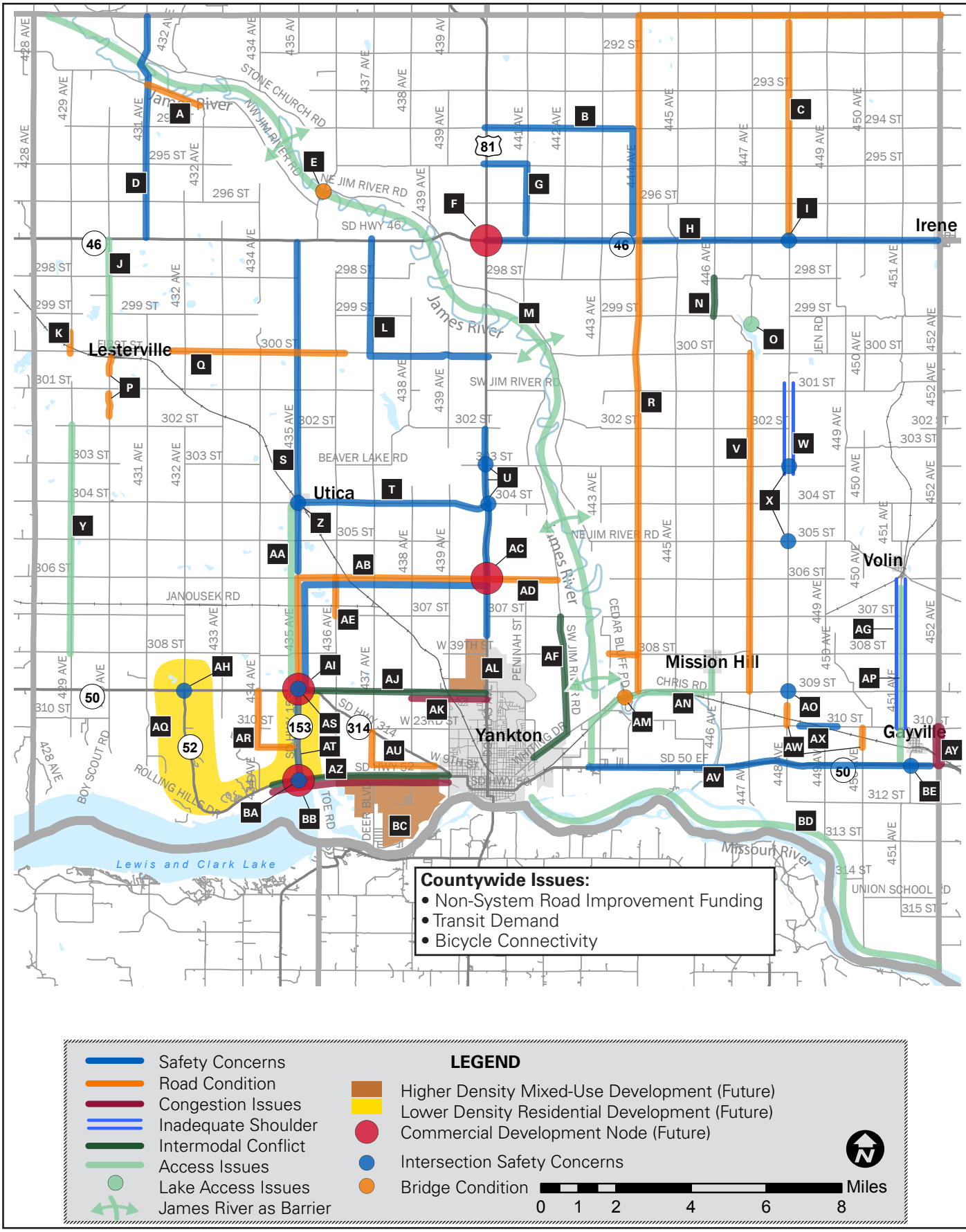


Figure 12 and the accompanying **Table 3** offer a consolidated view of the issues raised and discussed through community input.

[8] Source: http://www.airnav.com/airport/KYKN



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Issues Map

YANKTON COUNTY MASTER TRANSPORTATION PLAN

Figure 12

Table 3. Stakeholder-Identified Transportation Issues in Yankton County

Issue ID	Category	Description	Priority			
			1st	2nd	3rd	4th
A	Condition	Erosion along NW Jim River Road from the James River is damaging the road.				
B	Safety	Trucks raise safety concerns and damage the road on 294th St. while avoiding the Port of Entry.		1	1	
C	Condition	448th Ave. is paved south of SD 46, but unpaved north of SD46. Heavy use has degraded the upaved portion of the road.				
D	Safety	Trucks raise safety concerns and damage the road on 431st Ave. north of SD 46 while avoiding the Port of Entry.				
E	Bridge Condition	Bridge crossing the James River on 436th Ave. sometimes flooded. Detours caused by closed crossings add significantly to travel times.				1
F	Future Commercial Development	The intersection of US 81 and SD 46 is expected to experience additional commercial development.				
G	Safety	Trucks raise safety concerns and damage the road on 441st Ave. and 295th St. while avoiding the Port of Entry.	1			
H	Safety	The lack of shoulders and poor sight lines along SD 46 east of US 81 present safety issues. The road's curves and hills prevent easy passing of heavy vehicles and recreational vehicles.	2	2	5	1
I	Safety	The poor sight lines at the intersection of 448th Ave and SD 46 presents a safety hazard.				
J	Access	Seasonal weight restrictions on 430th Ave. prevent heavy vehicles from accessing Lesterville from the state highway.	1			
K	Condition	Rough railroad crossing on 429th Ave., west of Lesterville.				
L	Safety	Heavy trucks use 347th Ave. and 300th St. to bypass the port of entry at the intersection of US 81 and SD 46. The truck traffic damages the road and causes safety concerns due to turning trucks and mixed traffic.				
M	Access	The James River acts as a barrier to northeast-southwest travel throughout the county. The limited number of crossings concentrates traffic on a small number of roads.		1		1
N	Intermodal Conflict	A mixture of heavy truck, personal vehicle, and pedestrian traffic along 446th Ave south of SD 46 creates the potential for conflict between modes.				
O	Access	Marindahl Lake lacks easy access for bicycle and pedestrian traffic.				
P	Road Condition	430th Ave. has somewhat sudden severe curves south of Lesterville.				
Q	Road Condition	Occasional water inundation damages road.		1		
R	Road Condition	Heavy trucks carrying grain or gravel travel along 444th Ave. and 291st St., subjecting the roads to heavy wear and tear.				
S	Safety	Recreational traffic moves along 435th Ave. to bypass Yankton, creating safety concerns between SD46 and SD 52.				
T	Safety	Recreational traffic travels along 304th St. between US 81 and Utica to bypass Yankton, creating safety concerns.				
U	Safety	The intersections of US 81 and 303rd St. and 304 St. have poor sight lines, lane consolidation, and frequent turning traffic, creating safety concerns. The road segment from the northern city limits of Yankton to 302nd St. was identified as unsafe.			2	3
V	Condition	Unpaved 447th Ave. sees heavy truck traffic due to restrictions on neighboring roads.				
W	Inadequate Shoulders	448th Ave. lacks shoulders, and the need for them has been identified.				
X	Intersection Safety	Intersections of 448th Ave. with 303rd St. and 305th St. have poor sight lines due to crops, and people run stop signs.				
Y	Access	A bridge was removed along 429th Ave., disrupting the connectivity of the roadway network.				
Z	Safety	The intersection of 435th Ave. and 304th St. features an irregular design. Northern and southern approaches do not align, and a railway cuts diagonally across the intersection.				
AA	Access	Seasonal weight restrictions on 435th Ave. prevent heavy vehicles from accessing Utica from the state highway.				
AB	Safety/Road Condition	Potential industrial development at NAPA Junction is expected to generate heavy truck traffic along 435th Ave. and 306th St., exceeding the weight limit of the roads and creating safety concerns.				
AC	Future Commercial Development	The intersection of US 81 and 306th St. is expected to experience additional commercial development.				

Note: Issues were identified at the study advisory team (SAT) meeting of May 7, 2014, the public meeting held on June 16, 2014, and the stakeholders meeting of August 6, 2014.

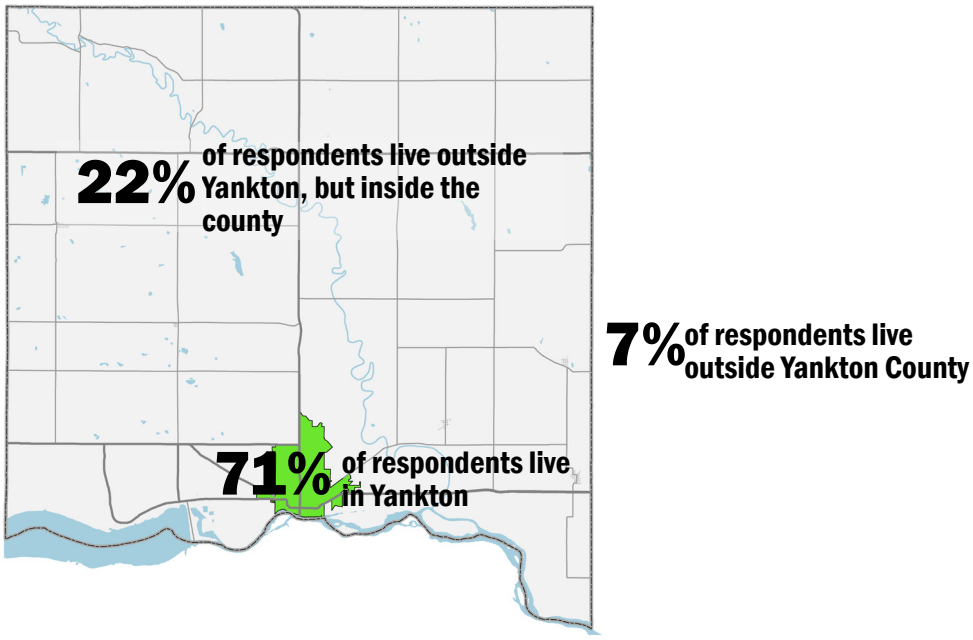
Issue ID	Category	Description	Priority			
			1st	2nd	3rd	4th
AD	Condition	Heavy truck traffic from gravel quarry damages 306th St. east of US 81.	1			1
AE	Road Condition	Future development of a transloading facility at NAPA Junction is expected to generate heavy truck traffic along 436th Ave. south of 306th St., exceeding the weight limit of the road.				
AF	Intermodal	Whiting Drive and SW Jim River Road see many bikes mixed with auto traffic.	1	1		
AG	Inadequate Shoulders	451st Ave. has insufficient shoulders between Volin and 310th St.				
AH	Intersection Safety	Intersection of SD 50 and SD 52 sees a significant level of mixed traffic.			1	
AI	Future Commercial Development	The intersection of SD 50 and 435th St./SD 153 is expected to experience additional commercial development.				
AJ	Intermodal	SD 50, between US 81 and SD 153, sees many bikes mixed with auto traffic.				
AK	Congestion	SD 50 is intermittently congested east of US 81.				2
AL	Future Mixed-Use Development	Mixed-use development on the northwest edge of Yankton will generate additional traffic in the area.				
AM	Bridge Condition	The bridge crossing the James River on Whiting Drive/309th St. is in poor condition and in need of replacement. The bridge lies on a primary commuter route into Yankton from the northeast.	4	5	1	
AN	Access	Seasonal weight restrictions prevent heavy vehicles from accessing Mission Hill from the state highway.				
AO	Safety	Drivers routinely ignore the stop signs on 448th Ave. at the intersection with 309th St.			1	1
AP	Access	Seasonal weight restrictions on 451st Ave. prevent heavy vehicles from accessing Volin from the state highway. In addition, Volin lacks easy bicycle access from the south.				
AQ	Future Residential Development	Future lower density development is expected along SD 52 and SD 153, which will create additional traffic and access points to the highways in the area.	1		1	
AR	Road Condition	Kaiser Road and 434th Ave. see significant vehicle travel, which damages the unpaved roads.				
AS	Safety	Frequently turning traffic and the presence of recreational vehicles creates a safety hazard at the intersection of SD 50 and 435th Ave./SD 153.	1	2		1
AT	Safety	Lack of shoulder, high speeds, poor sight lines, and a mix of vehicle traffic raise safety concerns on SD 153.	1			
AU	Road Condition	Deer Boulevard and W 11th St. see significant vehicle travel, which damages the roads.				
AV	Safety	There are many deer hits along SD 50 east of Yankton to the county line.				
AW	Condition	Rough rail crossings on 448th Ave. and 450th Ave., north of SD 50.			2	
AX	Safety	Poor sight lines at Rail crossing on 449th Ave. pose a safety risk when crossing.				
AY	Congestion	Congestion involving heavy truck traffic from a fertilizer plant appears on 452nd Ave. just north of SD 50.				
AZ	Intermodal Conflict/Congestion	Multiple residential, commercial, and recreational locations on either side of SD 52 generate pedestrian traffic along and across the road. The wide roadway and presence of a variety of vehicle types brings about the potential for intermodal conflict. Additionally, multiple access points and ongoing residential development create congestion issues along the corridor, particularly at the intersection with 439th Ave.	1	1	1	
BA	Intersection Safety	Intersection of SD 52 and SD 153 sees a significant level of mixed traffic.		1		
BB	Future Commercial Development	The intersection of SD 52 and 435th St./SD 153 is expected to experience additional commercial development.				
BC	Future Mixed-Use Development	Planned mixed-use development south of SD 52 just west of Yankton will generate additional traffic, particularly along SD 52 into Yankton.				
BD	Access	Few roads and large tracts of private land limit public access to the Missouri National Recreation River in the eastern portion of the county. In addition, the area lacks a bicycle/pedestrian trail.				
BE	Safety	There are safety concerns related to the intersection of 451st Ave. and SD 50.		1		

Note: Issues were identified at the study advisory team (SAT) meeting of May 7, 2014, the public meeting held on June 16, 2014, and the stakeholders meeting of August 6, 2014.

Community Survey

An online survey was used to collect information from members of the community in addition to the public meetings and the Stakeholders Committee. It was made available from June 16 through August 22, 2014 and yielded 74 responses. While this is not a statistically significant sampling of the Yankton County area, it does provide additional insight into the preferences and perspectives from area residents and workers. Of the 74 responses, 71 percent were from people living within Yankton, 22 percent were from people living in Yankton County but outside of Yankton, and seven percent were from people who live outside Yankton County.

The survey focused on requesting information about perceived transportation issues within the county and the relative importance of the range of issues.

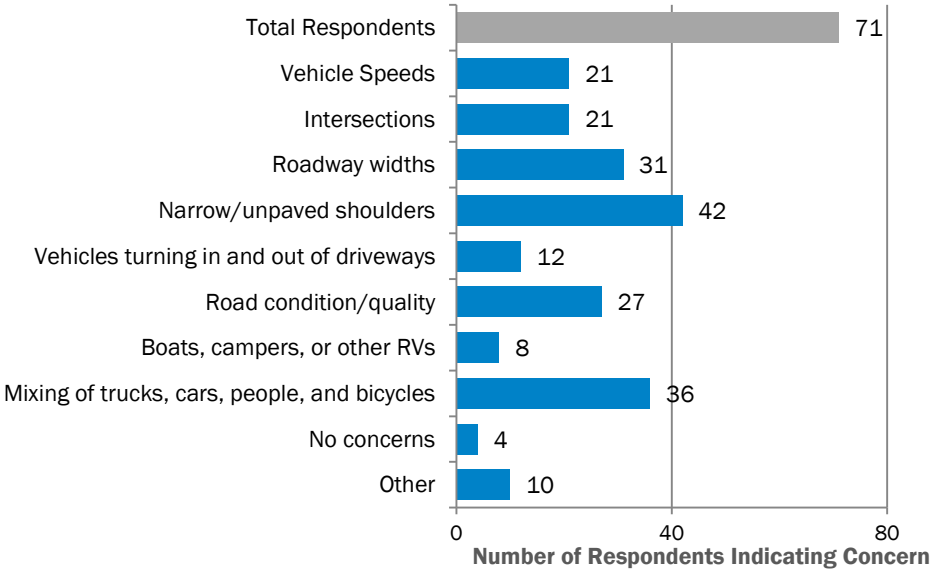


Perceptions of Safety

Survey respondents were asked in three questions about their perceptions of the safety of the transportation system. **Figure 13** summarizes the responses to the question, "Which components of transportation safety concern you most in Yankton County?" Respondents could select multiple answers.

Responses specifying "Other" include components such as concerns with bridges, highway crossings within the city of Yankton, and the availability of bike paths.

Figure 13. Perceptions of Safety of Transportation System Components



Funding Priorities

The survey included questions to gauge respondents' transportation spending priorities. The first question asked them to distribute an imaginary pool of money between several categories of transportation spending.

Out of every dollar spend on transportation, the average respondent prefers:

The three highest priority spending areas to come out of the survey are maintaining existing roadways, improving bicycle and pedestrian connections, and improving existing roadways. Existing road maintenance is

the highest priority spending category when looking at both the average and median allocations. Respondent's average allocation for bicycle and pedestrian improvements is just below the average allocation for existing road maintenance.

A more detailed analysis of all survey results can be found in *Appendix D*.

Analysis of Future Transportation Needs

This chapter considers probable future conditions that will impact Yankton County's transportation needs going forward. The analysis serves to identify the location and magnitude of changing traffic intensities and aging infrastructure over the period. It also helps establish where evolving uses of the transportation system may necessitate construction of different types of infrastructure (e.g., traffic signals, crosswalks, or bicycle facilities).

Future Growth Areas

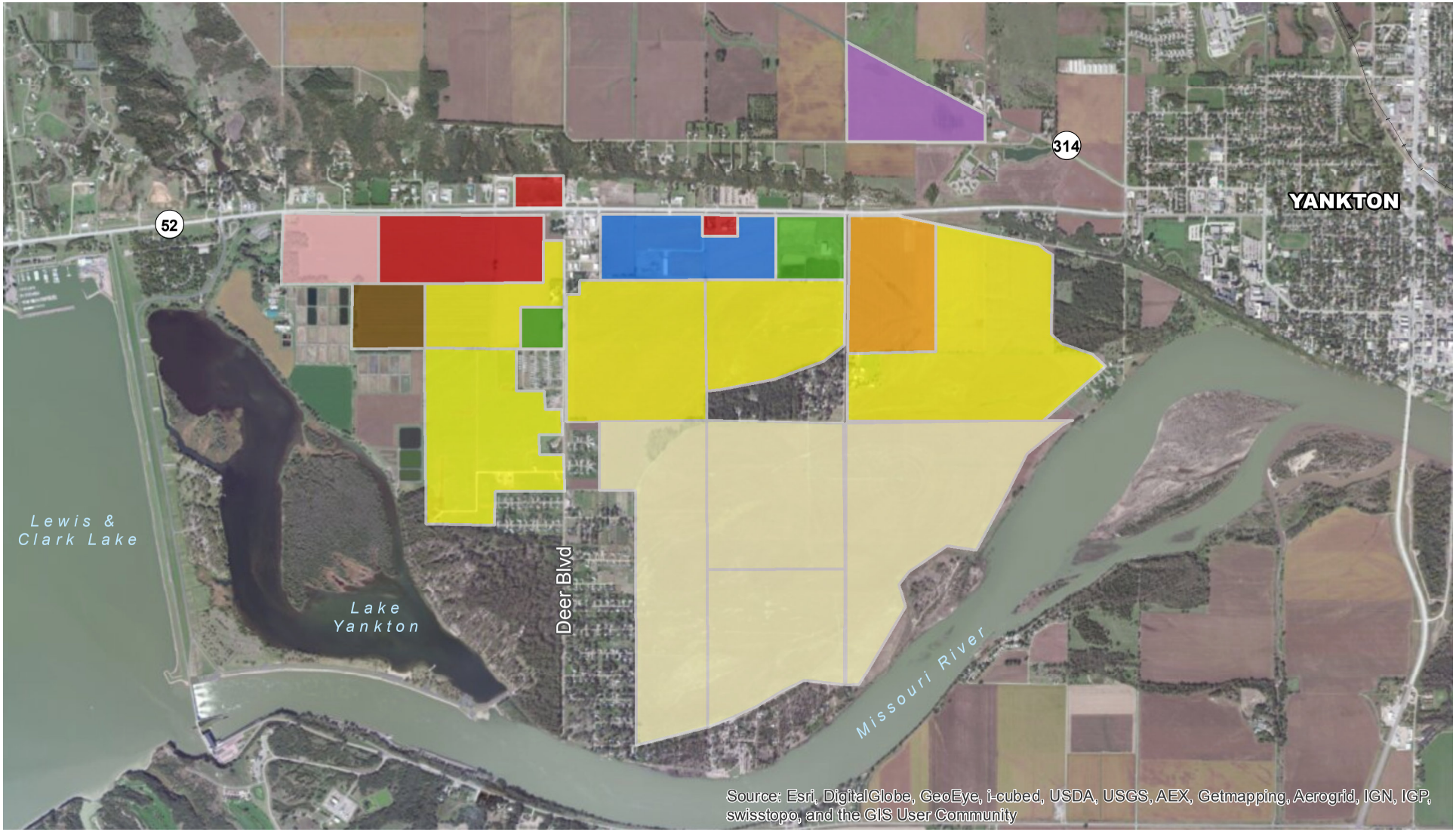
Land use and traffic growth are closely intertwined, so examining areas of anticipated land use development is a key part of forecasting future transportation needs.

Yankton County's Comprehensive Plan Update is currently underway, and detailed future land use maps are still in development. However, an area in Utica-South Township bounded by Yankton, State Highway 52 (SD 52), the Missouri River, and Lewis and Clark Lake has been identified as an area destined for significant growth. **Figure 14** details the land use plan for this proposed mixed-use development.

The identified area covers approximately 2,000 acres, or nearly half the area of the present limits of Yankton. Thus, it is anticipated that development of the area will be a decades-long period, extending beyond the horizon of this plan. Once fully built, the area will dramatically change traffic patterns in southwestern Yankton County. While much of the traffic generated by the increment of development will be funneled onto SD 52, the county will need to ensure that roads constructed internal to the development provide the connectivity and capacity necessary to support efficient traffic flow.

Information regarding the location, type and intensity of future development in the remainder of the county is less detailed. One likely assumption is that other areas will not experience the development intensity assumed just west of Yankton in the SD 52 corridor. The remainder of the county was divided into development activity areas reflecting the anticipated future development intensity. Areas were identified as:

- Low intensity development areas – Little change from current development is anticipated. Areas are primarily agricultural uses and will remain in their agricultural uses.



Legend

- Hotel/Commercial
- Retail/Commercial
- Office/Commercial
- High Density Residential
- Med Density Residential
- Low Density Residential
- Cabins
- Campground
- Sports Complex

0 0.5 1 Miles

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YANKTON COUNTY Master Transportation Plan

State Highway 52 Development Area

Figure 14

- Moderate intensity development areas – Areas in the vicinity of Yankton that will likely see enhanced residential growth and some industrial growth along highway and railroad corridors. The limits of the area east of Yankton are restricted relative to the west by the influences of the James River.
- High intensity development areas – Generally areas immediately adjacent to Yankton. These areas will likely experience a mixture of residential, commercial, and industrial activity abutting transportation corridors. Many of the developments will likely reflect urban densities, which are higher than in the rural areas.

Figure 15 displays the boundaries for each of the anticipated growth areas.

Napa Junction, an area at the intersection of two rail lines near 307th Street and 437th Avenue has been identified as a potential site for a transloading facility. Such a facility would increase the level of heavy vehicle and rail traffic in the western portion of the county and could require additional public or private investment to support it.

Future Traffic

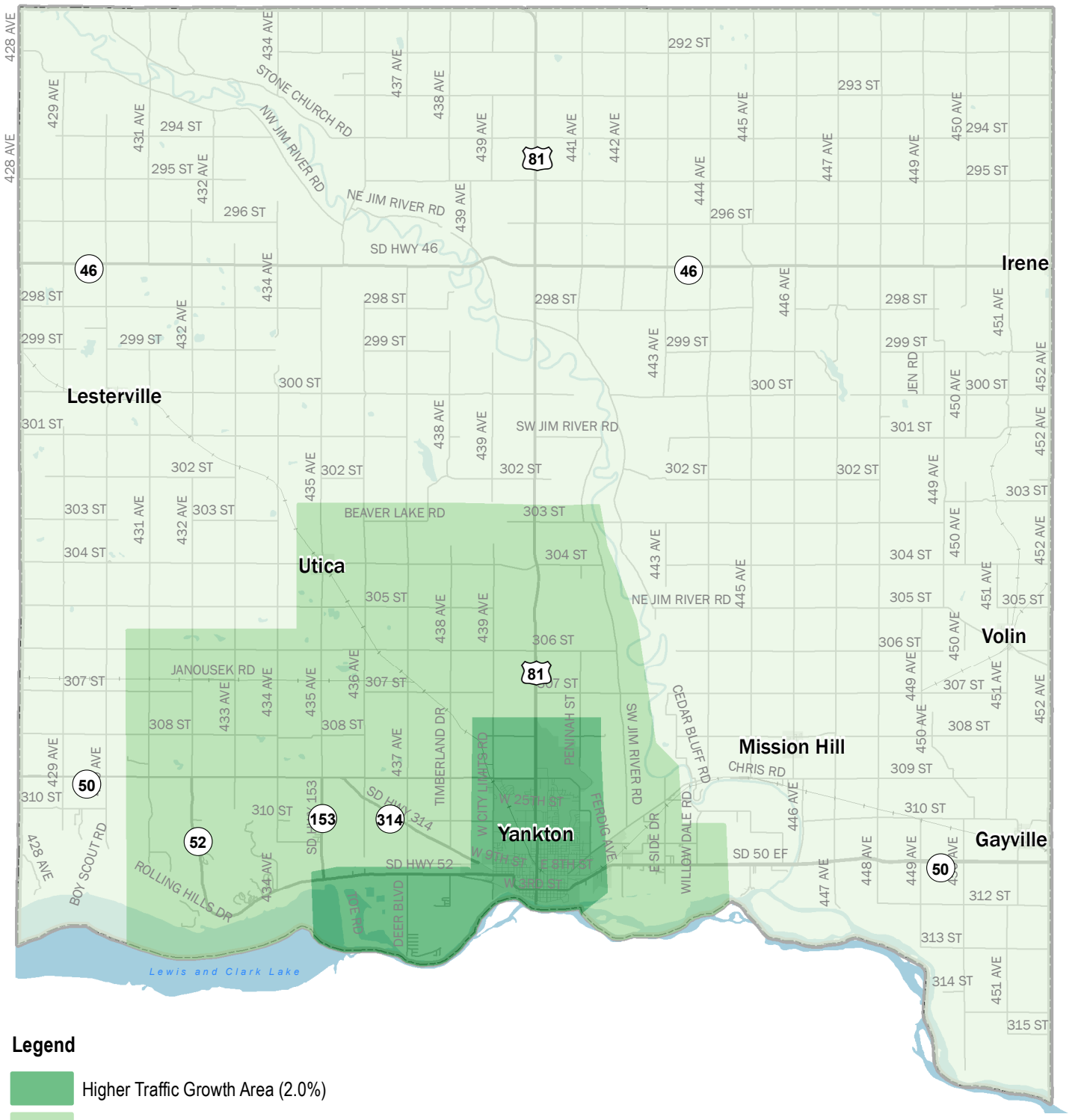
Traffic volume forecasts help identify areas where road capacity might be strained, leading to congestion problems, as well as where heavy use might deteriorate roadway conditions and require greater maintenance or upgrades to infrastructure.

Methodology

Projections of annual Average Daily Traffic (AADT) were prepared by applying an annual growth rate to current volumes based on the activity intensity area type highlighted in the previous section. Growth rates applied by activity area were derived from the annual traffic growth rate calculated by the South Dakota Department of Transportation (SDDOT) for Yankton County.

SDDOT estimates traffic growth rates for each county in South Dakota using a weighted average of the following factors:

- Historic AADT
- Employment forecasts
- Personal income forecasts
- Population growth forecasts
- Vehicle registration forecasts



Legend

- Higher Traffic Growth Area (2.0%)
- Moderate Traffic Growth Area (1.5%)
- Lower Traffic Growth Area (1.0%)

0 1 2 4 6 8 Miles

Annual Average Daily Traffic (AADT) Growth Rate Areas

Figure 15

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SDDOT estimates an AADT growth rate of 35.8 percent for Yankton County over the next 20 year, however, for this study a finer grain of geographic precision in the forecasts was applied to reflect differences in future development across the county.

For each development intensity activity area a unique annual traffic growth rate was defined, with the goal of the countywide composite reflecting the SDDOT annual compounded rate for Yankton County of 1.54 percent. The traffic growth rates correspond to areas of higher, moderate, and lower traffic growth based on anticipated land use patterns and were assigned annual growth rates of 2.0, 1.5, and 1.0 percent, respectively. Taken together, these growth areas are consistent the 1.54 percent countywide annual compounded growth percentage estimated by the SDDOT.

2040 Daily Traffic Forecasts

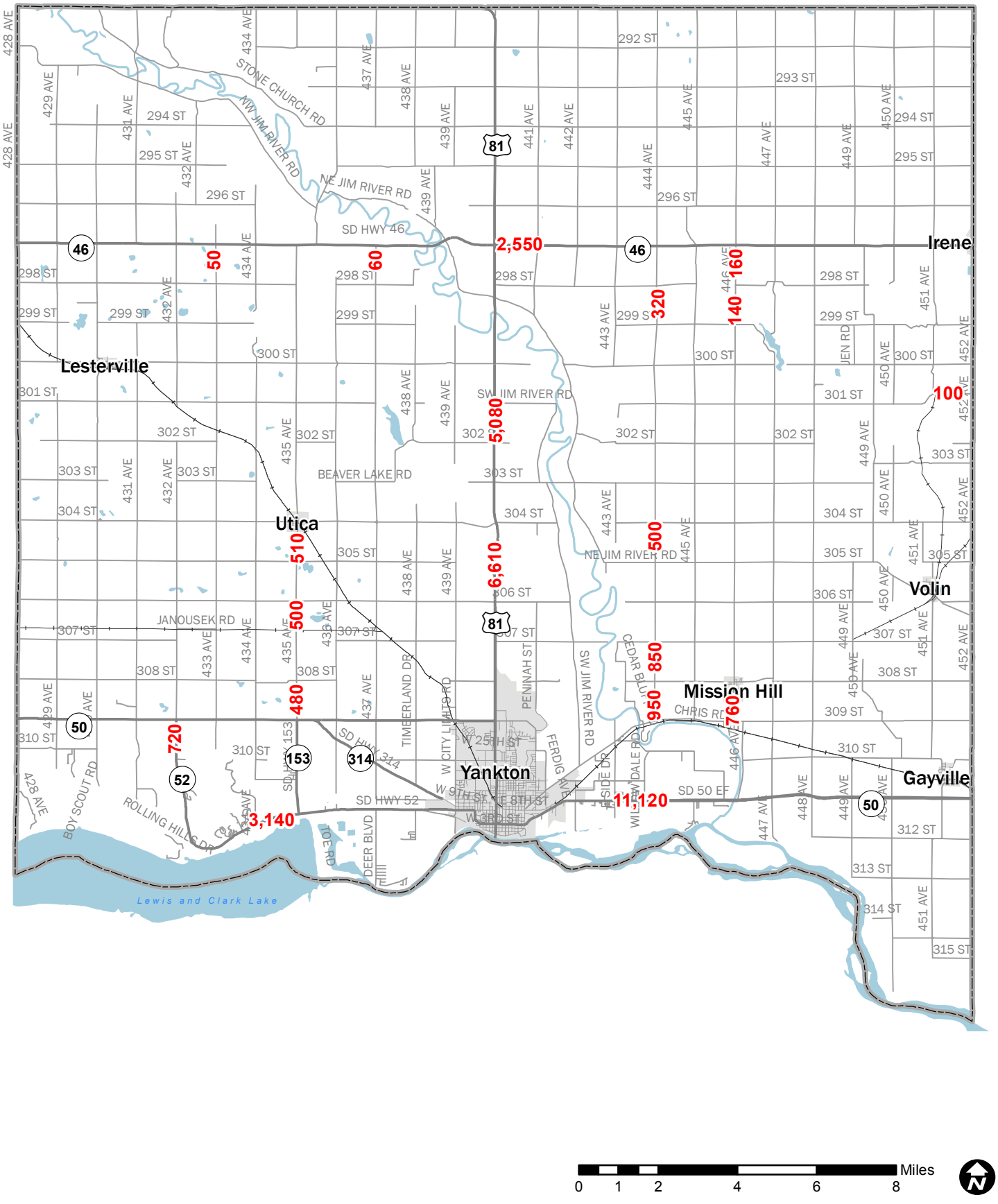
Annual growth rates were applied to the 2014 AADT estimates based on the locations of the count sites relative to the defined growth areas to obtain 2040 AADT forecasts. These forecasts are displayed in **Figure 16**.

The most heavily traveled routes, by far, are projected to be along the state highways. Of the roads under county jurisdiction, 444th Avenue has the highest projected traffic counts. The stretch of 446th Avenue connecting Mission Hill to 309th Street and the portion of 435th Avenue south of Utica are also expected to see higher traffic volumes than surrounding roads. However, no roads are expected to approach their capacity, and many roads will continue to see well under 100 vehicles per day.

Future State of Structures

As noted in the *Current Conditions* chapter of this document, the typical useful life span of a bridge is approximately 75 years. While being over 75 years old does not mean that a bridge is unsafe, the age is a useful benchmark for determining when the structure might need to be replaced. Culverts have a slightly longer typical life span.

Presently, 17 structures under county jurisdiction are at least 75 years old. If no structures were to be replaced, that number would jump to 46 by 2040. In order to replace all these aging structures in that timeframe, the county would need to replace on average roughly two bridges per year. Unfortunately, state aid for bridge and culvert replacement is limited, so Yankton County will likely need to find alternate sources of funding to address its aging structures. As seen in **Figure 17,** these structures are distributed throughout the county.



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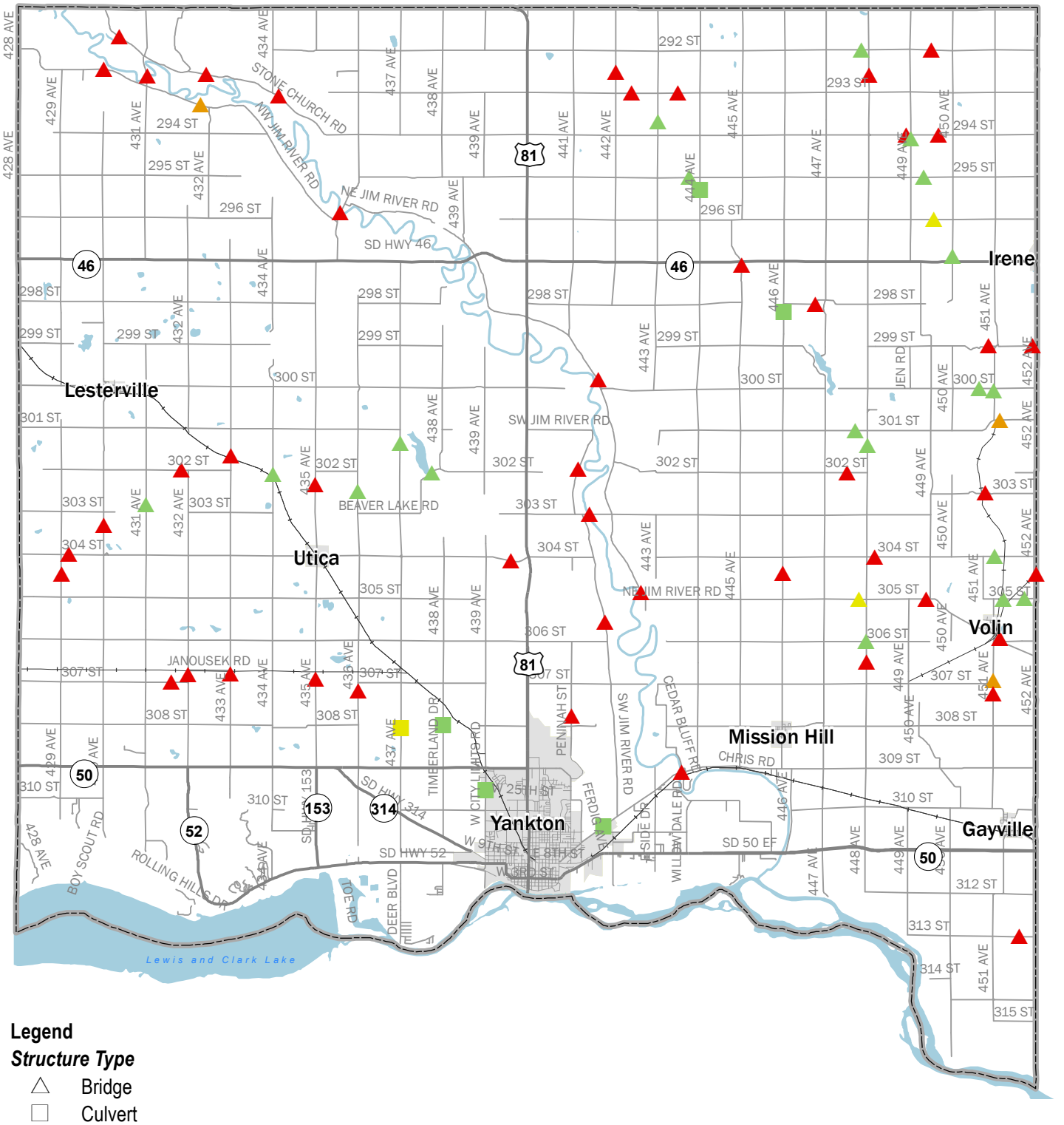
2040 Average Annual Daily Traffic (AADT)

Figure 16



Legend

Structure Type

- △ Bridge
- □ Culvert

Structure Age

- Less than 55 years
- 55 to 64 years
- 65 to 74 years
- 75+ years

0 1 2 4 6 8 Miles

N

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YANKTON COUNTY MASTER TRANSPORTATION PLAN

Age of County Structures in 2040

Figure 17

Addressing Current/Future Needs

This chapter of the Transportation Master Plan identifies a range of potential actions that could be taken to address the identified needs and also presents the results of an initial round of project screening.

Issue Categories and Preliminary Ideas for Addressing the Issues

The issues identified earlier in this document were categorized into five categories:

- Safety Concerns
- Congested Segments
- Intermodal Conflicts
- Inadequate Shoulder Width
- Access Issues

These categories were helpful for summarizing the issue areas, they do not address an issue's underlying cause, which is required in order to effectively identify potential strategies for addressing the issue. Thus, the issues were reorganized into new groupings based on causes and potential actions that could remedy the causes. The following action groupings are detailed below:

- Addressing Barriers
- Supporting Freight Movement/RV Travel
- Linking Rural Communities to the State System
- Supporting Countywide Non-Motorized Travel
- Fostering Economic Growth
- Repairing and Replacing Structures
- Correcting Geometric Deficiencies

While limited funding capacity for system improvements has traditionally been a major concern in the county, funding constraints were set aside for the step of identifying alternatives for addressing transportation issues, to allow the focus to be on reducing/resolving issues. For alternatives determined to be technically feasible and supported by stakeholders, costs relative to available funding was used as a factor to prioritize alternatives for implementation.

This chapter is organized as follows:

- Presentation of the range of ideas for addressing of revised issues groups defined earlier.
- Alternatives screening. A screening matrix has been developed to provide a summary of the benefits and impacts of each concept.

Reducing Travel Barriers

Several types of barriers limit the mobility of people traveling in certain parts of the county. Geographic features such as rivers or severe elevation changes can inhibit movement since they cannot be crossed without a bridge or extensive earthwork to address grade changes. The meandering James River is a notable example of this travel barrier. With its relatively wide channel and few existing crossings, it limits direct access from one side of the county to the other.

In some cases, parts of the transportation system designed for one mode can become barriers for other modes. For example, the width and higher operating speeds of SD 52 create a barrier to people walking or riding bicycles from Yankton to the Lewis and Clark Recreation Area. Another example of this type of barrier is the railroad. Long, slower-moving trains can cut off access across tracks in the absence of grade-separated crossings such as viaducts or tunnels.

James River

The James River runs north-south through the entirety of Yankton County, and it is only crossed by a few routes. Limited crossing locations force commuters from residential areas in the eastern half of the county onto 303rd Street or 309th Street (Old Highway 50) to get to Yankton. Additionally, the river limits access from some rural portions of the county to the state highway system, resulting in farm related heavy truck traffic being diverted on the county system not designed to handle the vehicle weights.

Currently, there are seven bridges that cross the James River throughout the county, three on the state highway system (US 81, SD 46, and SD 50) and four on the county system (303rd Street, 309th Street, 431st Avenue, and 436th Avenue). The only option to address this barrier is to construct a new bridge. A road should perform the following functions to be a good candidate for bridge construction:

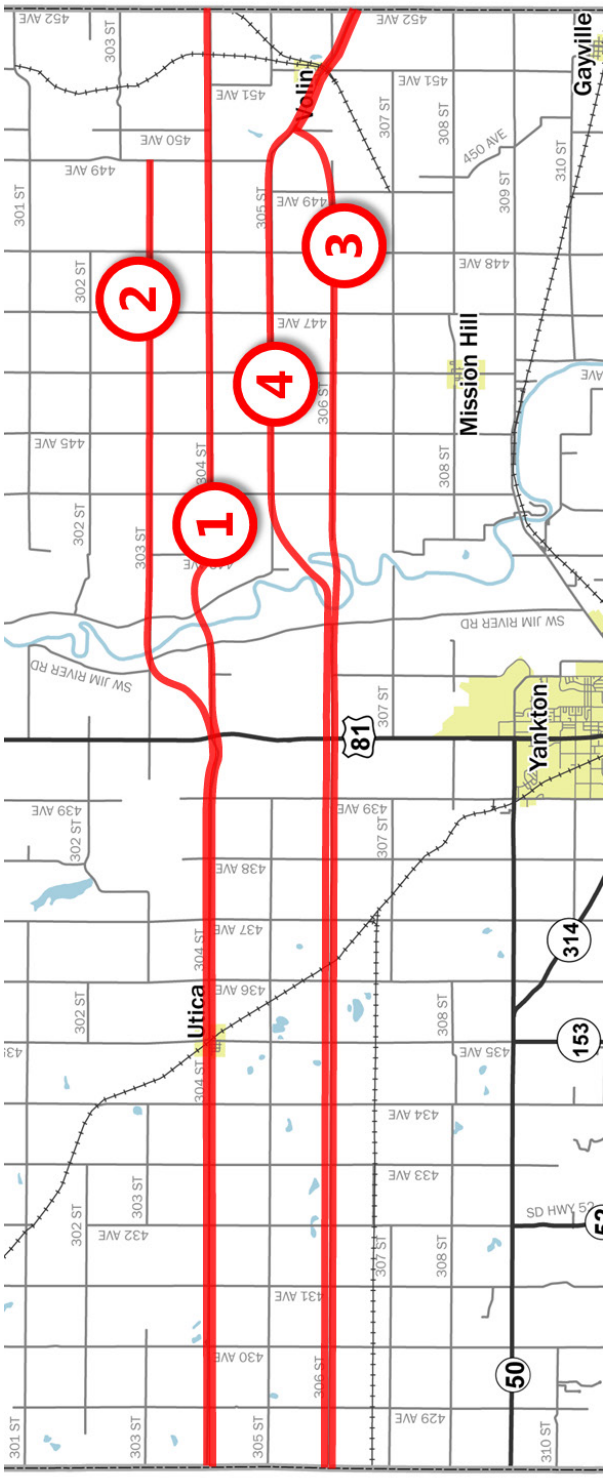
- Support the origins and destinations of travelers in a way that existing bridges cannot.

- Support designated truck routes.
- Improve emergency vehicle access in the county.
- A continuous corridor through much of the county.
- Serve multiple transportation modes.
- Result in manageable environmental and social impacts.

In the alternatives development, four concepts for reducing the travel barrier created by the James River were identified. The alternatives, shown in **Figure 18**, included combinations of improved and/or additional river crossings and establishment of more continuous corridors across the county. Of the four alternatives, one included upgrading an existing crossing (303rd Street), while the others provided new crossings. The alternatives are described below:

- Option 1: Create a new James River bridge crossing at 304th Street and an improved (non-weight restricted) two-lane corridor from the Bon Homme County line to the Clay County line.
- Option 2: Replace the existing 303rd Street bridge crossing of the James River and construct a new segment of two-lane (non-weight restricted) roadway connecting 303rd Street to 304th Street west of SW Jim River Road. In addition, improve both the 304th Street and 303rd Street corridors to create a continuous all-season route from 449th Avenue to the Bon Homme County line.
- Option 3: Create a new James River crossing along the 306th Street alignment and improve the current 306th Street corridor to a non-weight restricted route from the Bon Homme County line to 449th Avenue. The concept would include a new segment of rural two-lane road from 449th Avenue to 305th Street/450th Avenue west of Volin. The final element of the concept would be to improve the current 350th Street corridor from west of Volin to the Clay County line. This alignment would require three structures over the James River.
- Option 4: This option is an alternate to Option 3 to eliminate two of the 306th Street alignment crossings. The alternative provides a new James River crossing along the 306th Street alignment and a new connection to 305th Street on the west side of the James River. This new route alignment would avoid the meandering portion of the James River and require one structure. The route would travel to 305th Street west of 44th Avenue and then follow the 305th Street corridor through Volin to the Clay County line.

Figure 18. James River Crossing Improvement Alternatives



State Highway 52

Multi-lane, higher traffic, and higher speed roads can act as barriers to non-motorized travelers. As a five-lane roadway of approximately 60 feet width, SD 52 presents a challenge to people crossing on foot or by bicycle. Presently, the north side of the corridor west of Yankton has retail establishments and complementary residential and recreation uses are located on the south side. The combination of activities generate pedestrian and bike traffic wanting to cross the road, creating the potential for conflicts with vehicular traffic on SD 52. Additional development on the south side of the road will only increase demand for crossings.

There are two primary options to aid users in crossing the highway: signalized crossings and grade-separated crossings. When determining whether either is appropriate for a location/condition, care should be taken to ensure the location supports the origins and destinations of people traveling by non-motorized means and that applicable warrants are met. Supporting travel patterns will aid in gaining local support of the alternative and demonstrating demand (through meeting applicable warrants) will aid in gaining SDDOT support.

Signalized Crossings

Signalized crossings for non-motorized users can take one of two forms:

- They can be integrated into signals at intersections that also control vehicular traffic.
- They can be independent crosswalks not coordinated with a road intersection.

One essential concern when determining the appropriateness of a signalized pedestrian crossing or a signalized intersection along State Highway 52 is that some drivers might be unprepared to stop at that location. Currently, the highway has no signalized intersections west of the Yankton city limits. For eastbound travelers, a signal along SD 52 would be the first instance of having to stop upon entering the urbanized area. Signal visibility would be extremely important, particularly given the vulnerability of people crossing the highway without vehicles. Signs indicating an upcoming signal, rumble strips, and/or advanced warning flashers should be considered in support of a pedestrian crossing. The county will need to coordinate efforts with the SDDOT since the road is under state jurisdiction.

In the SD 52 corridor west of Yankton the likely logical locations to consider signalized intersections are:

- SD 52/SD 153 (435th Avenue)
- SD 52/Deer Boulevard

Current traffic volumes do not meet the minimum warrant for installation of a traffic signal, however, SD 52 and cross routes represent locations anticipated to experience the greatest traffic growth into the future. Thus, it is anticipated that within the 2040 planning horizon signals would likely be warranted at SD 153 (435th Avenue) and/or Deer Boulevard.

Installation of a pedestrian only crossing of SD 52 west of Yankton is inconsistent with practice due to the width and higher speeds along US 52. Research sponsored by the Minnesota Department of Transportation demonstrated the potential for an increase in pedestrian-vehicle crashes on higher speed (>40 MPH), multi-lane corridors when a marked pedestrian crossing is added. This research has been accepted by other states and municipalities (not Yankton County or the SDDOT) as pedestrian crossing treatments are evaluated. Using the Minnesota research, it is recommended that a signed pedestrian crossing not be included in the range of alternatives for reducing the SD 52 pedestrian-bicyclist barrier.

Grade-Separated Crossings

Non-motorized crossings either above or below the highway have the benefit of not relying on vehicular traffic to stop to allow people to safely cross the road. Pedestrian bridges also provide an opportunity to show support for non-motorized transportation in a very visible way.

Some drawbacks to consider related to grade-separated crossings include high costs, limited clearance under bridges, drainage issues for tunnels, and difficulty in making grade changes for people with limited mobility.

Warrants for recommending installation of a grade-separate pedestrian crossing, similar to signal warrants, have been developed[9]. Listed below are the general criteria for warranting a grade-separated pedestrian crossing:

- Pedestrian crossing volume of 100 or more in a four consecutive hour period of the day.
- Vehicle speeds over 40 MPH
- Vehicle volume in excess of 7,500 in the same four-hour period.

[9] Warrants for Pedestrian Over and Underpasses, FHWA, 1984.

While there are days in the summer months that would meet the pedestrian crossing counts, the days are limited in number and the volume component of the warrant would not be met.

For these reasons a grade-separated pedestrian crossing, while considered, would not likely be warranted in the planning period.

Railroad

Two rail lines cross Yankton County, one active and operated by BNSF and one inactive but leased for operation by Dakota Southern. The tracks, themselves, do not affect the continuity of the roadway network in the county, however, rail traffic along the BNSF line, and along the Dakota Southern line if it becomes active, can make travel more difficult in the area.

The predominant means by which trains limit mobility is by blocking vehicles while they cross roadways. A small number of homes east of Yankton are completely cut off from the rest of the road network when trains pass due to their position between the BNSF line and the James River, but all travelers in rural parts of the county experience some level of delay when trains pass. **Table 4** displays estimates of the time it takes for a 110-unit train to cross a road at a variety of speeds. At 15 mph, a train takes between five and six minutes to cross a road. Delay of this short time period will likely only affect access for emergency vehicles in any meaningful way, especially since the tracks currently see only approximately eight trains per day. Slower train operating speeds or stoppages can impact mobility for longer periods of time.

Table 4. Estimated Railroad Crossing Clearance Times by Speed for 110-Unit Train

Train Speed	5 MPH	10 MPH	15 MPH	20 MPH	30 MPH	40mph
Clearance Time	16 Min	8 Min	5-6 Min	4 Min	2-3 Min	2 Min

Note: Estimates are based on a 110-unit train with each train car 65 feet long for a total length of 7,150 feet or 1.35 miles.

The county has a variety of options to address the impacts on mobility posed by railroads. Strategies include emergency and school bus mobility plans to ensure that drivers and dispatchers have alternate routes prepared in the event that trains block rail crossings for extended periods of time, as well as the construction of grade-separated crossings. Additionally, grade-separated crossings can involve either trains elevated over automobiles or automobiles elevated over trains. The four main benefits of grade separation include reduced potential for collisions between vehicles and trains, reduced delay for

automobiles, reduced maintenance costs associated with crossing maintenance, and reduced train delay. Several characteristics help define a suitable location for a grade-separated crossing. The crossing should accomplish the following:

- Support the origins and destinations of travelers in the area.
- Reduce the potential for emergency vehicle delay on critical routes.
- Serve multiple transportation modes.
- Support a continuous corridor.
- Produce manageable environmental and social impacts.

Typically, the decision of whether to grade separate a railway crossing is based on economics. The costs of at-grade crossing maintenance, collisions, and delay must be compared to the costs of constructing the grade separation. Train, vehicle, and non-motorized traffic volumes all factor into the calculation heavily. Ultimately, the high cost and relatively low traffic volumes on roads under the jurisdiction of Yankton County that cross railways greatly reduce the feasibility of grade-separated crossings for the foreseeable future. In the meantime, safety concerns can be addressed though upgrading at-grade crossing features in higher traffic areas.

Supporting Freight Movement and RV Travel

Yankton County's roads see significant use from trucks and other vehicles pulling trailers. The vast majority of the roadway mileage under county jurisdiction are not designed/constructed to regularly accommodate heavy commercial vehicles. While truck access to agricultural lands, gravel mines, and other economic activity centers throughout the county is necessary, truck traffic should be funneled onto roads built to handle the heavy loads as much as possible.

In addition, trucks and recreational vehicles require greater distance to accelerate and decelerate and often travel at lower speeds than other automobile traffic. This difference in speed can cause congestion and delay for some travelers.

Designated Truck Routes

Vehicles carrying heavy loads with origins or destinations in parts of the county inaccessible via the state highway system take a toll on the condition of roadways. One option for countering the widespread impacts of truck traffic on rural roads is to create designated truck routes to consolidate traffic onto fewer roads designed and built to accommodate greater axle weights

throughout the year. Routes would be identified through signage, and local generators of truck traffic could be notified of and educated about the routes to encourage their use. Routes unsuitable for truck traffic may have signage warning of weight limits or restricting non-local truck traffic.

Preferred options for truck routes will share the following characteristics:

- Support truck origins and destinations.
- Include roads built to withstand heavier loads.
- Offer direct travel to the state highway system, minimizing the number of roads with higher load limits under county jurisdiction.
- Serve truck traffic from adjacent land uses.
- Avoid residential areas.
- Avoid environmentally sensitive areas.

Alternate routes for hazardous materials and all other truck traffic should be studied. Special consideration should be placed on avoiding residential and environmentally sensitive areas when delineating hazardous materials routes.

Using the criteria listed above, three alternates for truck routes were identified. All routes are north-south routes connecting the more prevalent east-west state routes that are presently located in the county. Presently, US 81 is the only north-south route designed and constructed to accommodate heavy commercial truck traffic. The routes proposed for consideration as truck routes are displayed in **Figure 19** and include:

- 435th Avenue – The route would run from SD 46 to SD 50, providing a route in the western portion of the county.
- 444th Avenue/309th Street/Eastside Drive – The route would provide a semi-continuous connection from SD 46 through SD 50.
- 448th Avenue – The route would be designated from SD 46 to SD 50 on the eastern portion of the county.

The proposed cross section associated with a designated truck route is provided in Roadway Design Standards chapter of this plan.

Designated Recreational Vehicle Routes

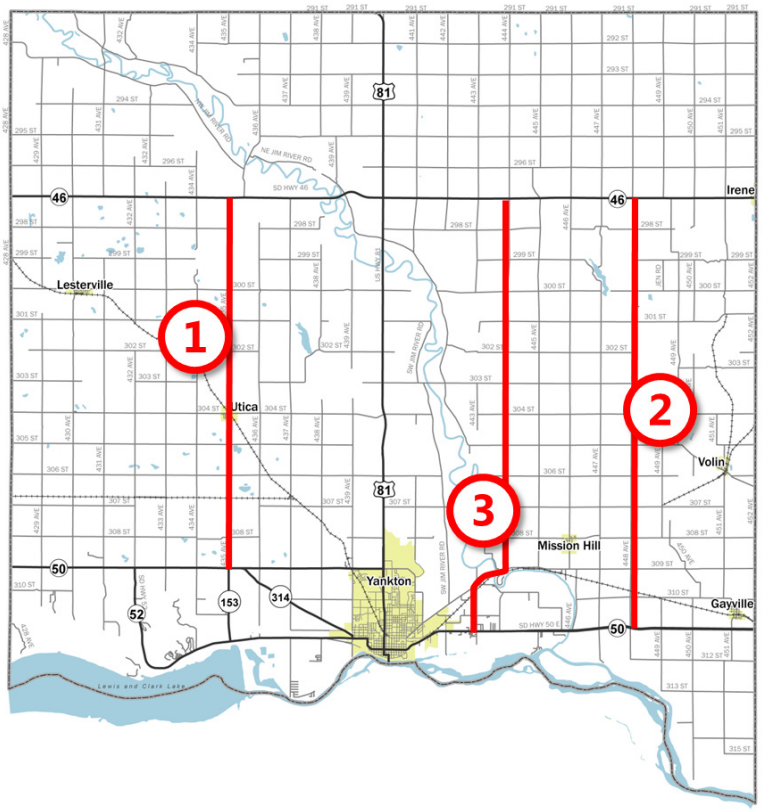
Yankton County's abundant recreational amenities draw people from throughout the region who drive large recreational vehicles and haul campers and boats on county roads. These travelers boost the local economy, but also impact the quality of the county's transportation system. Slower moving recreational vehicles cause traffic delay and create safety concerns in areas

where limited sight distance makes passing difficult. In addition, some visitors to the county might struggle to smoothly navigate the transportation network due to their lack of familiarity with the local area. The county should consider creating designated routes to ease recreational vehicle traffic through the area. Potential routes will have several important characteristics. Routes should accomplish the following:

- Support recreational origins and destinations.
- Provide wayfinding signage.
- Encourage the patronage of local businesses.
- Avoid high traffic areas where passing is difficult.
- Avoid roads with frequent stops.

Using these criteria, a single potential designated RV route was identified along 435th Avenue connecting SD 46 with SD 52 at the entrance to the Lewis and Clark Marina.

Figure 19. North-South Truck Designated Truck Route Alternatives



Linking Rural Communities to the State Highway System

Rural communities in the county, including Lesterville, Utica, Gayville, Mission Hill, and Volin, lack year-round access for heavy vehicles to and from the state highway system due to seasonal weight restrictions on county roads. There is concern that economic development opportunities in the rural communities are inhibited due to the lack of all-season commercial vehicle access routes. Establishing all-season access routes along county roads to link rural communities to the state highway system to allow heavier loads could help lay the foundation for additional economic development.

Identified all-season routes should share the following attributes:

- Support origins and destinations of heavy vehicle traffic to/from the community.
- Minimize the mileage of roadway requiring reconstruction to support heavy vehicles.
- Serve multiple transportation modes and purposes.

While the above characteristics can assist the county in choosing among route options, the overriding concern will likely be minimizing mileage of the route, thereby minimizing costs of road reconstruction. The number of reasonable route alternatives available for many rural communities is extremely limited due to their locations relative to the state highway system.

Figure 20 displays the range of alternatives initially identified for review relative to providing the desired community-to-state highway all-season connections. Through the initial screening each of the alternatives were reviewed relative to their ability to meet the desired goal of connecting communities to the regional system and cost associated with providing the connection.

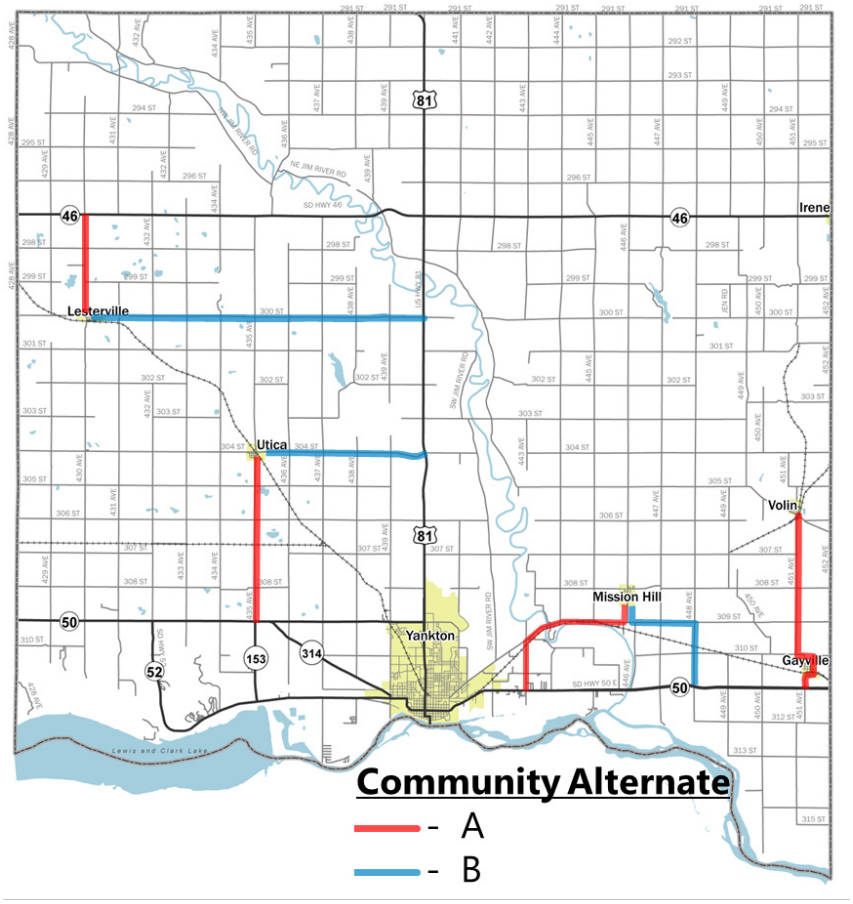
Supporting Countywide Non-Motorized Travel

Yankton County's scenic landscape creates an environment conducive to hiking and bicycle riding at a variety of skill levels for a variety of purposes. Paved Trails near Lewis and Clark Lake and within Yankton provide a setting for more casual recreational riding along with limited commuter access to work. Rural roads and unpaved trails in Lewis and Clark Recreation Area offer options for more experienced road and mountain bike riding. While Yankton County's non-motorized transportation network provides a range of options for its users, there are ample opportunities to enhance the system.

When considering improvements or additions to the non-motorized system, it is helpful to identify the needs of various types of users. This plan

categorizes users into two main groups based on the types of facilities preferred by each. The first group, referred to herein as "casual users," is composed of recreational cyclists and pedestrians who travel shorter distances for more leisurely purposes at a slower pace. They are less comfortable traveling on facilities that also carry automobile traffic. The second group, "proficient users," is made up of more experienced bicyclists interested in longer and more challenging recreational rides or rides that are part of a regular commute. Users in this category are more comfortable riding in mixed traffic and prefer routes that offer stimulating challenges for recreational rides and direct routes for commute trips.

Figure 20. All-Season Commercial Connection Alternatives



Enhancing the System for Casual Users

Recreational Trail Use near Lewis and Clark Lake

The existing trail system near Lewis and Clark Lake provides an excellent setting for recreational walking and biking for people originating from Yankton or within the park itself, but an opportunity exists to connect the newer residential development along State Highway 52 and State Highway 153 (including the Kaiser Road area) to the existing system through new multi-use trails or on-street markings. Adequate signage is a necessary component of system expansion to aid in wayfinding from place to place. By connecting rural residential areas into the system, residents will gain safer and more comfortable non-motorized access not only to the park area, but to the city of Yankton via the Highway 52 Trail.

Alternatives for providing improved pedestrian and bicyclist connectivity developed for review include:

- Developing a north side of SD 52 multi-se trail from West City Limits Road in Yankton to SD 153 (435th Avenue).
- Establish a detached multi-use trail along the west side of SD 153 (435th Avenue) from Kaiser Road to SD 52. This connection would provide access to/from higher density rural residential development areas along SD 153 (435th Avenue) and Kaiser Road.
- Provide a north side of SD 52 multi-use trail from SD 153 (435th Avenue) to approximately Lewis and Clark Trail and the entrance to Lewis and Clark Recreation Area.
- Incorporate into the design concept of a future Aspen Road on-street bike facilities, which may be additional width for a bike lane or simply signage as a bike route. This facility would provide accessibility for current and future residential properties located in the southern area of the developing area west of Yankton.

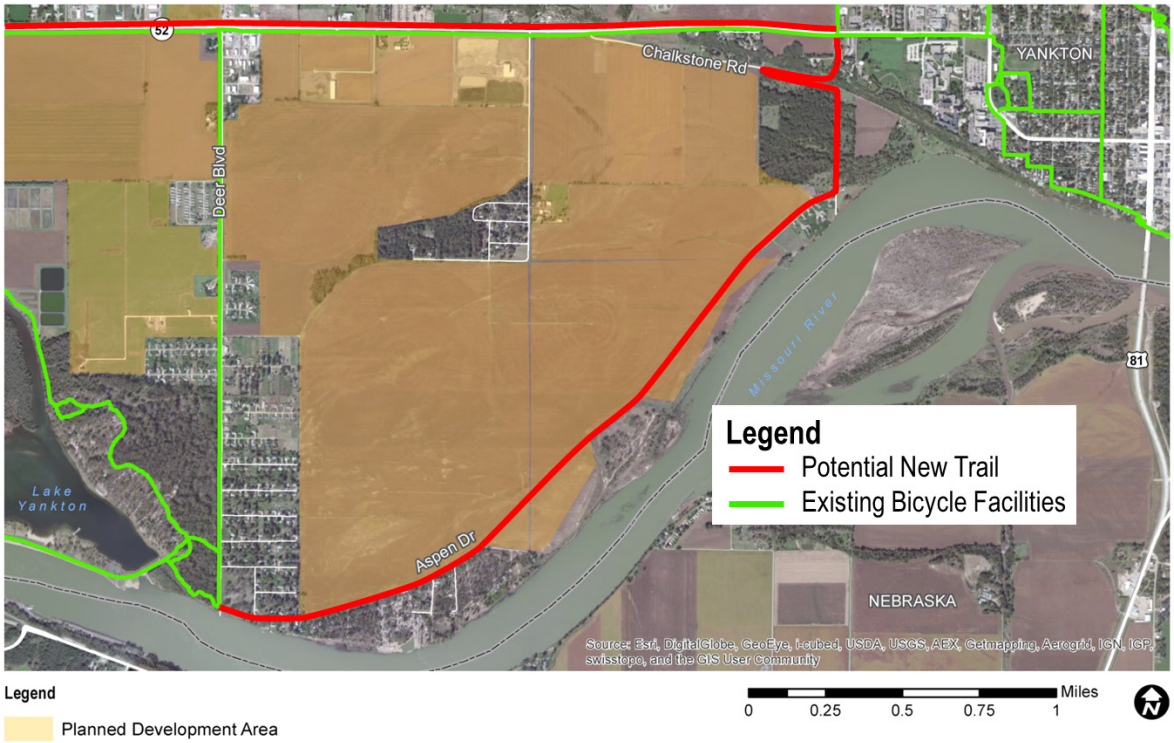
Figure 21 displays the range of pedestrian and bicyclist connections.

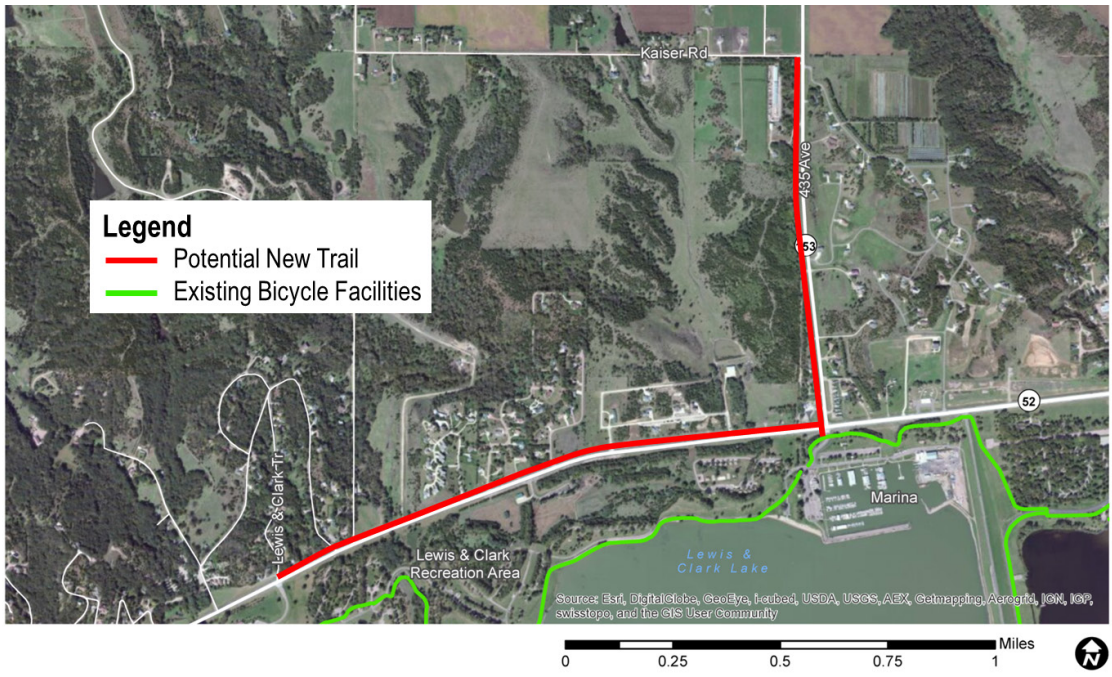
Recreational Access to the Missouri River

While Yankton residents and visitors have excellent access to trails along Lewis and Clark Lake, they lack significant access to the Missouri River below Riverside Park in Yankton, especially along the Missouri National Recreation River east of town. A new trail constructed along the north shore of the Missouri River would provide non-motorized access to the area without significantly altering character of the natural landscape. Crossing the James River will require either a new bridge south of SD 50 or modification

of the bridge crossing the river at SD 50 to accommodate a trail. In either scenario, the trail would require the negotiation of easements or the purchase of land from area property owners.

Figure 21. Non-Motorized Transportation Network Improvement Alternatives





In addition, attention should be paid to trail surface type in relation to cost and expected levels of use. Concrete is the most durable surface with the lowest required yearly maintenance, but it has the highest upfront construction costs. Compacted gravel (typically limestone) has a lower construction cost, but significantly higher maintenance costs, especially in areas that suffer from occasional flooding. Asphalt has moderate upfront costs, but high maintenance costs. Asphalt also requires a greater amount of earthwork to accommodate the necessary gravel substrate, which can be problematic in environmentally sensitive areas. In general, the level of investment should be somewhat proportionate to a facility's expected use.

Enhancing the System for Proficient Users

Connecting Communities

Currently, more serious bicyclists who desire longer rides through the county must identify their own routes and rely on maps or memory to guide them through the county. Cyclists can end up on roads with unexpected conditions or unsure of how to access rural communities during their rides. Yankton County has an opportunity to encourage additional longer distance bicycling and facilitate bicycle tourism to the area by identifying and designating a route through the county that takes advantage of the scenic views and challenging hills while guiding riders to local communities to support local businesses. The designated route would initially rely on signage to minimize costs and gauge interest, but as routes are rehabilitated enhancements such as wider shoulders should be considered. A typical bikeable shoulder is at least 6.5 feet wide and includes a four-foot wide smooth section separated from automobile traffic by rumble strips placed near the solid white line. Rumble strips should include regular gaps to allow people on bicycles to move between the travel lane and shoulder.

When possible, the designated route should avoid roads carrying higher volumes, heavy trucks, and recreational vehicles. Routes identified address these considerations as they are generally off, but parallel to the state system.

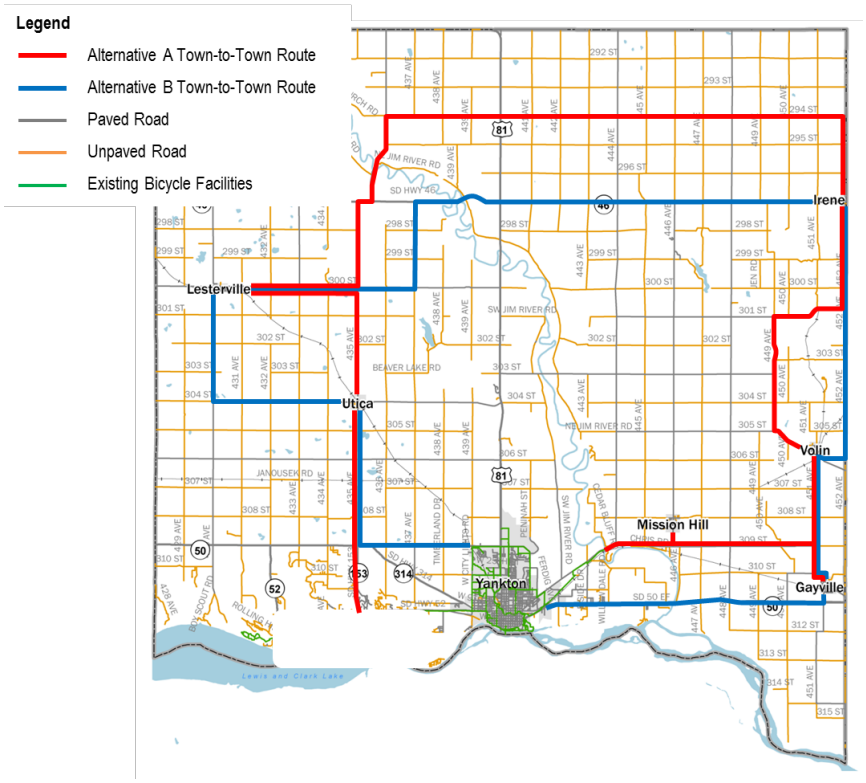
The range of route alternatives proposed for assessment is displayed in **Figure 22**.

Enabling the Commute

Beyond providing challenging recreational rides, infrastructure enhancements should support work-related trips for people traveling by non-motorized means. The rural route between communities described above could help create a designated path for cyclists commuting between rural areas and

Yankton. In addition, on-street markings and signage in the developing residential areas near Yankton would help motorists identify areas with higher levels of bicycle traffic and define routes where cyclists can travel more safely without using the busiest roadways.

Figure 22. Regional Shared Bicycle Route Alternatives



Fostering Economic Growth

Many of Yankton County's roads will see increases in traffic volumes and changes to traffic types as the county's economy continues to grow. In order to accommodate additional demands on the system in a way that supports the desired residential and commercial development, Yankton County will need to consider modifications to and expansions of its transportation system that take into account future needs.

Upgrading Intersection Control

Managing traffic at intersections is an important part of responding to and preparing for additional growth. Intersections where stakeholders identified safety concerns and intersections that will see additional traffic resulting from increased commercial and residential development could warrant intersection

control upgrades. Typical upgrades would include signalization or the addition of turn lanes.

Intersections meeting warrants for upgrades based on traffic volume, speed, or risk will likely be at locations along the state highway system, so the county will need to coordinate with the SDDOT to determine appropriate intersection treatments and potential funding sources.

Supporting a Greater Mix of Transportation Modes

Additional development near county roads will change the character of traffic along those roads. By increasing densities of potential origins and destinations, new development will increase the likelihood of people choosing to travel by non-motorized means. Accommodating these system users will require a rethinking of typical road cross sections to include facilities that support bicycle and pedestrian movement such as wider shoulders, sidewalks, or separated trails. The proposed county road design standards include a Multi-use Collector concept that incorporates key elements that support safe pedestrian and bicycle travel, including:

- Wider paved shoulders.
- No or limited use of rumble strips suggested along other types of collector routes.

Repairing and Replacing Structures

Alternatives for addressing bridge deficiencies are limited to suggesting looking for alternate funding and being as proactive as possible to obtain funding when opportunities arise. Over the course of the 25-year planning horizon, a significant number of structures will require repair or replacement, though a simple review of age or sufficiency rating will not reveal an accurate schedule of replacement. Structure replacement will need to be determined on a case-by-case basis, however, a reasonable assumption is that structure replacement (or removal) will require a substantial portion of the county's transportation budget.

Correcting Geometric Deficiencies

Based on consultations with the SAT, it is unlikely that the county would have the resources to develop a program to address spot horizontal or vertical alignment deficiencies. Thus, while locations of geometric deficiencies have been identified, no specific actions have been identified for the alternatives review. The county will actively seek funding opportunities that would allow for correction.

Initial Screening of Alternatives

The specific actions described in the previous section went through an initial screening process at public meeting on December 5, 2014 and meetings with the SAT and Stakeholders Group. Strategies were either dismissed due to technical difficulty, high cost, or a lack of public support or advanced to the next stage of analysis. A selection of benefits and challenges for each strategy alternative can be found in **Table 5** along with results of the screening. A summary of the public meeting appears in *Appendix E*.

Table 5. Primary Issue/Gap Area Alternatives and Initial Screening

Issue Area/Need to Address	Alternative Description	Alternative Screening (Initial)		Initial Screening Recommended Action (Advance/Dismiss/Modify)
		Opportunities	Challenges	
BARRIERS				
	• Extend 304th Street Across James River from Jim River Road to 443rd Avenue • Pave 304th Street from Jim River Road to 452nd Avenue	• Establishes a continuous E-W route through width of county – Including existing RR at-grade crossing • Improves connectivity of Utica. • More properties with direct access than other options – Benefit from paved route.	• Replicates crossing at 303rd Street (1 mile north) - Creates an additional bridge to maintain. • Adds to paved miles to maintain. • Average profile grade ~10% from Jim River Road to half way to 443rd Avenue.	**Dismiss.** The topography and required negotiations would make this option difficult. Too close to the existing bridge on 303rd Street to justify the costs and effort.
	• East of US 81 Connect 304th Street to 303rd Street (existing Crossing)	• Takes advantage of a current James River bridge to create a MORE continuous corridor • Improves connectivity to Utica	• Diagonal route through rural area – high property impacts • Route not continuous across county.	**Advance.** The option of providing a new crossing without constructing a new bridge makes this option worth exploring further.
Improve Access across the James River – Divides County	• Extend 306th Street Across James River from SW Jim River Road to west of 444th Avenue (Hideaway Road) • Pave 306th Street from US 81 to Bluff Road-Jackson Avenue (CR 368) • New Road from 448th Avenue to Bluff Road-Jackson Avenue CR 368)	• Additional James River crossing closer to where future development is likely to occur.	• Likely requires MULTIPLE James River bridges. • Significant impacts to residential properties. • Likely requires removal of a substantial number of trees. • Significant elevation change from river to Hideaway Road (~10% or more over approx. ¼ mile)	**Dismiss.** Costs of construction outweigh advantages.
	• Create a new crossing of the James River connecting 306th Street on the west side to 305th Street on the east. • Pave 306th Street from US 81 to SW James River Road. • Pave 305th Street from NE Jim River Road (CR 368) to 444th Avenue.	• Additional James River crossing closer to where future development is likely to occur. • Crossing's proximity to Yankton could reduce emergency response times to areas east of the James River. • Provides relief to existing 309th Street bridge. • Provides relatively continuous route across the county, connecting directly to Volin.	• Diagonal route through rural area – high property impacts. • Topography near James River will make construction costly. • Width of floodplain will require long bridge.	**Advance.** Of the options, the location of this new crossing is best.
Overcome the SD 52 Multimodal Barrier	Establish Multi-use trail along north side from 435th Avenue to South Deer Boulevard. Signalized pedestrian crossing at 435th Avenue	• Most logical (potentially warranted) signal control location in corridor (taking into account vehicles, peds, bikes).	• Signalized crossing is at westerly end of developed corridor (it is really where people want to/need to cross?). • Signal warrant not met for 10+ years (at least) of growth.	**Advance/Modify.** Retain the trail on the north side of SD 52 to provide access between destinations. Establish methodology to determine when signalized pedestrian crossing is warranted at either 435th Avenue or Deer Boulevard.
	Establish Multi-use trail along north side from 435th Avenue to South Deer Boulevard. Signalized pedestrian crossing at South Deer Boulevard.	• Establishes a more centralized crossing point (relative to current and proposed development.	• Signal warrant not met for 10+ years (at least) of growth.	
Burlington Northern/Santa Fe Rail Road	Build a grade-separated crossing of the railroad tracks.	Minimizes the connectivity losses due to rail traffic.	Volume on county (or state) routes outside Yankton - Warrants not met and not likely to be met in future. Cost is likely prohibitive.	**Dismiss.** Rail and vehicle traffic volumes will not warrant a grade-separation for the foreseeable future.

Issue Area/Need to Address	Alternative Description	Alternative Screening (Initial)		Initial Screening Recommended Action (Advance/Dismiss/Modify)
		Opportunities	Challenges	
Truck and Recreational Vehicle Routes				
Establish Designated County System Truck Routes that Separate Modal Conflicts and Emphasize Freight Function	<u>Option 1</u> • Establish a truck route along 435th Avenue from SD 46 to SD 50. • Reconstruct identified truck route to accommodate heavier loads. • Use signage to direct trucks to dedicated routes and prohibit heavy truck traffic on other county roads for non-local use.	• Focuses heavy vehicle traffic onto roads better suited to handle the weight. • In the long-term, prevented damage to roads could save the county money in maintenance costs. • Connects heavy vehicles in the western portion of the county to/from state highways to the north or south. • Outside of Utica, there is little residential development along the route.	• Requires active enforcement. • Limited resources would make road reconstruction difficult. • Heavy trucks would be directed through Utica, near several residences. • Directs traffic through two intersections with identified issues, one in Utica includes railroad tracks. • Route would place additional wear on two bridges. • If a transloading facility reanimates the Dakota Southern rail line, the truck route would cross active rail lines at two at-grade points. • Potentially supports truck traffic avoiding the SDDOT Port of Entry at the intersection of US 81 and SD 46.	**Advance.** 435th Avenue is already heavily used by trucks and provides a north-south route that is roughly hallway between US 81 in the center of the county and the county line. A truck route in this location also provides an all-seasons route to Utica, and the shoulders of a truck route will allow it to be used as a bicycle corridor.
	<u>Option 2</u> • Establish a truck route along 448th Avenue from SD 46 to SD 50. • Reconstruct identified truck route to accommodate heavier loads. • Use signage to direct trucks to dedicated routes and prohibit heavy truck traffic on other county roads for non-local use.	• Focuses heavy vehicle traffic onto roads better suited to handle the weight. • In the long-term, prevented damage to roads could save the county money in maintenance costs. • Offers access to heavy vehicles in the eastern portion of the county to/from state highways to the north or south.	• Requires active enforcement. • Limited resources would make road reconstruction difficult. • Route would increase wear on three bridges. • Heavy trucks would be concentrated on a road running by several rural residences. • Trucks traveling to/from the quarry on 308th Street near the James River would need to travel 4-5 miles on unimproved county roads to access the route. • Directs traffic through four intersections with identified issues and one railroad crossing with an identified issue.	**Dismiss.** Does not serve the origins and destinations of heavy vehicles through the county.
	<u>Option 3</u> • Establish a truck route along 444th Avenue from 309th Street to SD 46; 309th Street from 444th Avenue to 448th Avenue; and 448th Avenue from 309th Street to SD 50. • Reconstruct identified truck route to accommodate heavier loads. • Use signage to direct trucks to dedicated routes and prohibit heavy truck traffic on other county roads for non-local use.	• Focuses heavy vehicle traffic onto roads better suited to handle the weight. • In the long-term, prevented damage to roads could save the county money in maintenance costs. • Offers heavy truck access close to the point of trip generation at the quarry on 308th Street near the James River. • Does not cross any bridges, placing no additional strain on them.	• Requires active enforcement. • Limited resources would make road reconstruction difficult. • Route does not directly connect two state highways along one road. Turns in route will require additional signage and add mileage to road reconstruction. • Directs traffic through one intersection with identified issues and one railroad crossing with an identified issue.	**Modify.** Establish route along 444th Avenue from 309th Street to SD 46; along 309th Street from East Side Drive to 444th Avenue; along East Side Drive between SD 50 and 309th Street. Supports heavy vehicle origins and destinations. Creates and all-seasons route nearly reaching Mission Hill.
Designated Recreational Vehicle Routes	• Establish a recreational vehicle route along 435th Avenue from SD 46 to SD 50. • Install signage to help with wayfinding to/from Lewis and Clark Lake area.	• Eases navigation for recreational visitors. • Removes slow vehicles from the busier US 81. • Provides a scenic route to Lewis and Clark Lake from the north, avoiding travel through Yankton.	• Directs traffic away from Yankton's shopping destinations. • Does not address recreational vehicle traffic along SD 46. • Directs recreational vehicles through the difficult intersection of 435th Avenue, 304th Street and railroad tracks in Utica.	**Advance.** Coincides with truck route along 435th Avenue

Issue Area/Need to Address	Alternative Description	Alternative Screening (Initial)		Initial Screening Recommended Action (Advance/Dismiss/Modify)
		Opportunities	Challenges	
BNSF Mainline and Discussed NAPA Reactivation	Construct Minimum of One Grade Separated Crossing of the BNSF Rail Line and/or Dakota Southern Line (outside of Yankton)	• Reduces emergency vehicle response times during train crossing events • Reduces vehicle delay during train crossing events. • Reduces auto-train crash exposure	• Combination of vehicle-trains does not meet generally supported exposure threshold for constructing. • Cost versus benefit (few crashes have been reported) • Raising or lowering the rail line would require reconstructing the rail line for ½ mile either side of the crossing. Many construction period impacts.	**Dismiss.** Rail and vehicle traffic volumes will not warrant a grade-separation for the foreseeable future.
ECONOMIC DEVELOPMENT - ALL-SEASON LINKS BETWEEN RURAL COMMUNITIES AND STATE HIGHWAY NETWORK				
Provide Improvements to Pavement and Sub-base to allow Removing Spring Weight Restrictions	• Lesterville: ○ Improve 430th Avenue 3 miles north to SD 46 ○ Improve 300th Street 10 miles to US 81 ○ Improve 300th Street 4.5 miles to 435th Avenue in conjunction with improvements on 435th Avenue	• 430th Avenue (North): ○ Shortest of route options (lower cost) • 300th Street (East): ○ More directly serves both east-west and southern flow (through connection to US 81 and Yankton being the primary destination) • 300th Street (shortened) ○ Provides benefits of access to the east without the costs of improving all the way to US 81.	• 430th Avenue (North): ○ Serves less volume than a route to the south or east. • 300th Street (East): ○ Length adds substantially to the cost – higher cost relative to 430th Avenue option, not offset by greater mobility provided. ○ Topography and proximity of road to surface water will increase construction costs and potential for environmental impacts. • 300th Street (shortened) ○ Dependent on improvements along 435th Avenue. • 430th Avenue/300th Street: ○ Few rural area properties are accessed – Little benefit outside Lesterville from investment.	**Advance 430th Avenue.** Shortest route and serves origins and destinations well.
	• Utica: ○ Improve 435th Avenue 5 miles south to SD 50 ○ Improve 304th Street 5 miles east to US 81	• 304th Street (East): ○ Direction connection to more regional route (US 81 as opposed to SD 50). ○ Combine with James River crossing (to resolve a barrier identified) on 304th Avenue, segment improvements provide benefit outside Utica. • 435th Avenue (South): ○ Provides improved north-south route to/from recreation areas west of Yankton – Bypasses through Yankton slower travel.	• 435th Avenue (South): ○ Does not provide level of regional accessibility as 304th Street east to US 81.	**Advance 435th Avenue.** Roadway improvements will also serve the heavy truck route and bicycle route.
	• Volin: ○ Improve 451st Avenue 4 miles south to 310th Street, 310th Street to 450th Avenue, and 450th Avenue to SD 50.	• 451st Avenue (South): ○ Provides regional connection to SD 50 – First towns on east side of county (I-29 corridor to east is bigger draw than opportunities to west) ○ Bypasses the residential streets of Gayville. ○ Serves an agricultural operation on 450th Avenue.	• 451st Avenue (South): ○ Does not contribute to the Gayville economy..	**Advance.**
	• Gayville: ○ Improve 451st Avenue ½ mile south to SD 50	• 451st Avenue (South): ○ Provides regional connection to SD 50 – First towns on east side of county (I-29 corridor to east is bigger draw than opportunities to west).	• 451st Avenue (South): ○ Development traffic still passes through Gayville with many driveways/conflict points.	**Dismiss.** Locations east of Gayville generating heavy truck traffic already have all-seasons access to SD 50.

Issue Area/Need to Address	Alternative Description	Alternative Screening (Initial)		Initial Screening Recommended Action (Advance/Dismiss/Modify)
		Opportunities	Challenges	
Provide Improvements to Pavement and Sub-base to allow Removing Spring Weight Restrictions	• Mission Hill ○ Improve 446th Avenue ½ mile south to 309th Street ; 309th Street 6 miles west to Yankton ○ Improve 446th Avenue ½ mile south to 309th Street; 309th Street east to 448th Avenue (Assumes 448th Avenue to upgraded as Truck Route)	• 446th Avenue (South)/309th Street (West): ○ Provides all season connection to Yankton – (which is a regional destination- could enhance Mission Hill development). • 446th Avenue (South)/309th Street (East): ○ Creates a more direct connection to SD 52 and destinations to east (i.e. I-29). ○ Encounters fewer homes/driveways (conflicts) along route. ○ Provides dual benefit to potential truck route designation on 448th Avenue.	• 451st Avenue (South): ○ Development traffic still passes through Gayville with many driveways/conflict points. • 446th Avenue (South)/309th Street (East): ○ Adds more traffic to BNSF RR crossing (safety concern – does it suggest more crossing safety features?)	**Modify.** Improve 446th Avenue ½ mile south to 309th Street; 309th Street to west across James River; East Side Drive between SD 50 and 309th Street. Reinforces a route already in use by heavy vehicles. Meets up with identified heavy truck route.
COUNTYWIDE NON-MOTORIZED NETWORK				
Recreational Trail Use near Lewis and Clark Lake	Construct a multiuse trail along SD 153 between Kaiser Road and SD 52, connecting to the existing Lewis & Clark Lake Trail near the Marina.	• Provides a growing rural residential area safer non-motorized access to the Lewis & Clark Lake Recreation Area and into Yankton through the existing county and city trail systems. • Supports both recreational and commuter travel.	• Trail users will need to cross SD 52, which currently has no marked or signalized pedestrian crossings.	**Advance.** Study demand for trail.
	Construct a multiuse trail along the north side of SD 52 from the entrance to the Lewis and Clark Recreation Area at Lewis & Clark Trail to SD 153.	• Provides safer non-motorized access from a cluster of rural residences to the Marina, Yankton, and other destinations to the east. • Supports both recreational and commuter travel.	• Could encourage crossing SD 52 between the west end of the trail and the entrance to Lewis & Clark Recreation Area, a point with no marked or signalized crossing. • Trail users could have difficulty crossing SD 153 or SD 52 to reach destinations to the east.	**Advance.** Study demand for trail.
	Construct a multiuse trail along the existing and platted Aspen Road from Deer Boulevard to the existing trail at SD 52 and West City Limits Road.	• Provides safe and scenic non-motorized access between Yankton and new residential development to the west of town as well as connecting to the Lewis and Clark Recreation Area through existing trails. • Supports both recreational and commuter travel. • Takes advantage of an existing ROW platted for Aspen Road and connects to existing trails to create a larger interconnected network. • Provides increased non-motorized connectivity to an area planned for extensive mixed-use redevelopment.	• As a commuter trail, it is slightly redundant to the existing trail along SD 52.	**Advance.** The ROW already exists for the new trail. Alignment provides a scenic alternative to the trail adjacent to SD 52.
	Construct a multiuse trail extending from the existing trail at Paddlewheel Point to the western edge of the county along the Missouri National Recreation River.	• Provides non-motorized access to the Missouri National Recreation River. • Offers a unique, scenic recreational experience.	• Accessing property could be difficult due to the placement of several residences along the shore of the Missouri River. • The alignment of the trail could be difficult to determine due to its likely placement in the floodplain. • Crossing the James River would require a new bridge or a modification to the existing SD 50 bridge. • The potential for use might not justify the relatively high costs of construction. • Does not support commuter travel.	**Dismiss.** High cost while providing little transportation function.

Issue Area/Need to Address	Alternative Description	Alternative Screening (Initial)		Initial Screening Recommended Action (Advance/Dismiss/Modify)
		Opportunities	Challenges	
Connecting Communities: Establish bicycle connections between communities in the county. (See Action Categories Memo for additional detail on the route treatment.)	Yankton-Mission Hill-Gayville-Volin: • East from Yankton along Whiting Drive/Chris Road to 451st Avenue. South to Gayville or north to Volin along 451st Avenue. Mission Hill connects via 446th Avenue. • East from Yankton on SD 50 to 451st Avenue and then north to Gayville. North from Gayville to Volin along 451st Avenue. Mission Hill connects via 446th Avenue and 309th Street.	• Option A: ○ Minimizes route mileage to connect four communities. ○ Avoids traffic and high speeds of state highways. ○ Uses a route already identified as used by bicyclists. • Option B: ○ Uses existing shoulders of SD 50. ○ Does not require a spur route to link to Gayville.	• Option A: ○ Requires short spur routes to connect Mission Hill and Gayville. ○ Narrow bridge crossing over James River. • Option B: ○ Requires long spur to connect Mission Hill. ○ Does not directly connect Mission Hill to Yankton.	**Advance Option A** Avoids state highways. Makes use of shoulders planned on identified truck routes.
	Volin-Irene: • Southeast from Volin on Bluff Road to 306th Street. 306th Street to 452nd Avenue/County Line Road. Then north to Irene. • Northwest from Volin on 305th Street to 449th Avenue. 449th Avenue to 301st Street and then east to 452nd Avenue/County Line Road. North to Irene.	• Option A: ○ Uses a route already identified as used by bicyclists. ○ Shorter distance. • Option B: ○ Less of route is on county line.	• Option A: ○ Straddles a county line. Might require cooperation from Clay County. • Option B: ○ Straddles a county line. Might require cooperation from Clay County.	**Advance Option B.** Incorporates route already used by cyclists.
	Irene-Lesterville: • West from Irene on SD 46 to 437th Avenue and then south to 300th Street. West to Lesterville. • North from Irene on 452nd Avenue/County Line Road to 294th Street and then west to 436th Avenue. South to SD 46, west to 435th Avenue, and south to 300th Street. West to Lesterville.	• Option A: ○ Shorter, more direct route. ○ Avoids travel on 435th Avenue, which could become a designated truck route. • Option B: ○ Avoids traffic and intersections with identified safety concerns on SD 46.	• Option A: ○ Directs bicyclists through stretch of SD 46 with many identified safety concerns, heavier traffic, and unpaved shoulders. • Option B: ○ Avoids traffic and intersections with identified safety concerns on SD 46. ○ Short segment on higher traffic SD 46. ○ Longer, less direct route.	**Advance Option B.** Avoids portion of SD 46 identified as dangerous.
	Lesterville-Utica: • South from Lesterville on 430th Avenue to 304th Street and then east to Utica. • East from Lesterville on 300th Street to 435th Avenue and then south to Utica.	• Option A: ○ Offers more variety in the circuit by not doubling over the section of 300th Street east of Lesterville. ○ Avoids slightly higher traffic of 435th Avenue. • Option B: ○ Requires less overall route mileage on the circuit due to using 300th Street to travel both to and from Lesterville.	• Option A: ○ Adds mileage to the circuit. ○ Directs bicyclists through curves identified as safety issues south of Lesterville. • Option B: ○ Directs bicyclists to 435th Avenue for a greater portion of the circuit, exposing them to slightly heavier traffic.	**Advance Option B.** Makes use of shoulder planned for identified truck route. Allows 300th Street to be used for travel in both directions.
	Utica-Yankton • South from Utica on 435th Avenue/SD 153 to SD 52. Trail along SD 52 east to Yankton. • South from Utica on 435th Avenue to SD 50 and then east into Yankton.	• Option A: ○ Provides direct access to the Lewis and Clark Recreation Area. ○ Integrates with the existing network of trails west of Yankton. • Option B: ○ Shorter, more direct route to Yankton. ○ Allows riders to use existing paved shoulders of SD 50. ○ Integrates into Yankton bike facilities on north side of town.	• Option A: ○ Directs bicyclists to SD 153, a hilly highway with unpaved shoulders and heavier traffic. • Option B: ○ Does not directly connect to the Lewis and Clark Recreation Area and its trails.	**Advance Option A.** Avoids the traffic of Highway 50. Connects to the existing trail system.

Issue Area/Need to Address	Alternative Description	Alternative Screening (Initial)		Initial Screening Recommended Action (Advance/Dismiss/Modify)
		Opportunities	Challenges	
GEOMETRIC DEFICIENCIES				
Spot Deficiencies Along Routes or at Intersections. Key issues included in this category: • Geometric deficiencies along 430 Avenue south of Lesterville • Sight distance concerns along SD 46 at 448th Avenue. • 300th Street – Roadway elevation relative to field drainages that flow to Beaver Creek - Periodic flooding. • SD 153 – Intersection sight distance restrictions – SD 50 to SD 52. (Restrictions on county cross routes). • BNSF Railroad crossing condition on 448th Avenue and 450th Avenue • 451st Avenue – Shoulder lacking. • 448th Street/305th Avenue – Intersection sight distance • 448th Avenue/303rd Street – Sight Distance • 435th Avenue/304th Street (Utica) – Intersection geometrics and railroad warning signage.	Develop Funding Program to Address Each Individually	• Accelerate addressing known concerns. • Most of the "spot" issues represent primary corridor concern/need.	• Funding in county is limited. Addressing specific concerns before approaching minimum pavement condition thresholds/or to correct demonstrated safety issue results in delaying addressing other needs. • Can create multiple construction projects on a route (creating vehicle delay/safety issues) over a relatively short span of time.	**Advance.** Develop a management/prioritization plan and/or tool.
	Coordinate with Larger Corridor Improvement	• One construction disruption addresses multiple corridor issues. • Lower administrative costs – No new program to administer	• Timing – Addressing an issue/need may be years into the future as a larger project cost requires more financial planning/savings.	**Advance.**
TRANSIT SERVICE IN RURAL AREAS				
Provide Some Level of Service In County OUTSIDE Yankton Collaborate with Local Taxi Service	Extend Yankton Transit Service	• Basics of service infrastructure are in place. • Could integrate with In-town service. • Marketing program basics are in place. • Public entity would be recipient of subsidy. • Yankton Transit – Experienced in building partnerships and with grants – For funding.	• Likely need to add vehicles and drivers. • Possibly need more administration. • Cost effectiveness relative to in Yankton – Much lower. • Gathering support for local match/subsidy. • Finding local matching funding (~40—50% of cost)	
	Collaborate with Local Taxi Service	• Can tailor level of service (only pay for trips provided)	• Reaching agreement on trip cost. • "Subsidy" goes to a private operator (sometimes raises questions by public). • Need to develop charter/franchise contract. • Accessible vehicles?	

Funding Evaluation

The initial screening of alternative transportation network improvement strategies yielded several that were supported by staff and residents (either representatives of the Stakeholders Committee or people attending the December 2014 public meeting) for additional review. In order to further assess the feasibility and relative priority of each strategy, cost estimates were developed. A budget estimate was also prepared, and cost and budget estimates were then compared.

Project Cost Estimates

This section details the assumptions underlying the unit cost basis for specific elements and project cost estimates for each strategy that made it through the initial screening.

Unit Cost Assumptions

Roadway Construction

Base per mile construction costs for two-lane rural roads capable of supporting heavy vehicle traffic year-round were obtained from the South Dakota Department of Transportation. Project cost estimates started with the SDDOT construction costs and included adjustments for preliminary engineering and environmental costs, right-of-way acquisition, construction mobilization, and construction engineering.

Total unit costs used in the estimates are displayed in **Table 6**.

Table 6. Unit Costs for Two-Lane Rural Road Construction

Terrain Type	Unit	Base Cost from SDDOT	PE/ Environmental	ROW	Construction Mobilization	Construction Engineering	Total Cost per Mile
Flat/Rolling	Mile	$1,445,000	10.0%	5.0%	10.0%	7.5%	$1,914,600
Severe (15% premium)	Mile	$1,661,800	10.0%	5.0%	10.0%	7.5%	$2,201,900

Bridge/Culvert Replacement

Culvert installation costs were obtained from Yankton County Highway Department from projects completed or initiated in 2014. Existing bridges shorter than 60 feet long were assumed to be replaceable with a culvert for approximately $250,000. With the exception of replacing bridges over the

James River, structures associated with the examined improvements are 60 feet or less.

Replacement or new construction costs of bridges longer than 60 feet were estimated to be approximately $200 per square foot. The SDDOT design manual documents standards for rural highway bridge widths of 32 to 40 feet, depending on the 20-year projected ADT. For the purposes of the transportation plan cost estimates, a width of 36 feet was assumed, as it represents the middle of the width range and would be appropriate for forecasted volume of 551 to 1,500 ADT (a range consistent with the county routes crossing the James River).

Signals

Unit costs for traffic signals were obtained from SRF's professional experience. Each signal is estimated to cost approximately $125,000.

Multi-Use Trails

Cost estimates for trail construction were generated from SRF's professional experience in trail design and construction and confirmed with estimates used in the Pennington County Transportation Plan. An eight-foot-wide concrete trail assumed a project cost of $400,000 per mile to build.

Bicycle and Recreational Vehicle Route Signage

Signage unit costs were obtained through an examination of similar projects throughout the country. It is estimated to cost approximately $250 for each mile of signage on a designated bicycle or recreational vehicle route.

Cost Estimates for Strategies Advanced from Preliminary Screening

Cost estimates for the strategy alternatives under consideration appear in **Table 7**. A map of the location of each of the alternatives is included in **Figure 23**.

The estimates listed in **Table 7** do not include the ongoing costs of replacing bridges/culverts on a regular basis as their functional lives end. Each structure (<60 feet) replaced is estimated to cost $250,000.

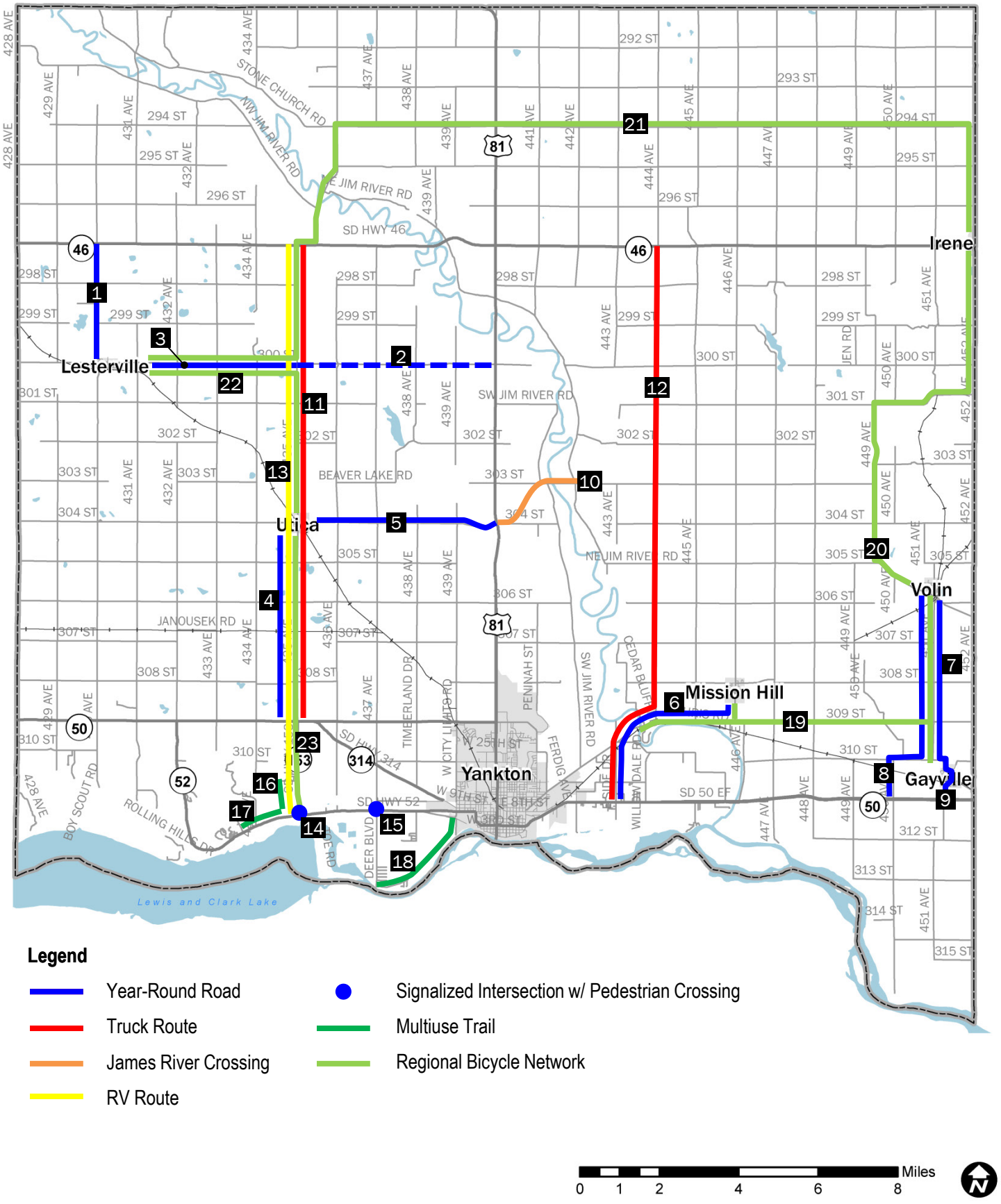
Table 7. Yankton County Preliminary Project Cost Estimates

Project Description	Cost
Reconstruct roads to allow removal of spring weight restrictions	
1. Lesterville - 430th Ave to SD 46	$5,552,300
2. Lesterville - 300th St to US 81	$18,380,200
3. Lesterville - 300th St to 435th Ave	$8,615,700
4. Utica - 435th Ave to SD 50	$9,248,600
5. Utica - 304th St to US 81	$9,440,100
6. Mission Hill - 446th Ave/309th St/East Side Drive	$10,338,800
7. Volin - 451st Ave to SD 50	$10,838,800
8. Volin - 451st Ave, 310th St, and 450th Ave to SD 50	$12,370,500
9. Gayville – 450th Ave to SD 50	$1,723,100
Improve access across the James River	
10. Connect 304th St to 303rd St	$6,543,700
Establish designated county system truck routes with no weight restrictions	
11. 435th Ave from SD 46 to SD 50	$23,283,700
11a. 435th Ave from Utica to SD 50	$9,248,600
11b. 435th Ave from SD 46 to Utica	$14,035,100
11c. 435th Ave from Utica to 306th St	$3,829,200
12. 444th Ave from SD 46 to SD 50	$28,144,600
Designate recreational vehicle routes	
13. Recreational Vehicle Route along 435th Ave	$2,975
Overcome the SD 52 multimodal barrier	
14. Provide a signalized crosswalk at SD 52/SD 153	$125,000
15. Provide a signalized crosswalk at Deer Blvd	$125,000
Expand the recreational trail system near Lewis and Clark Lake	
16. Trail along SD 153 from Kaiser Rd to SD 52	$320,000
17. Trail along the north side of SD 52, west of SD 153	$560,000
18. Trail along Aspen Road	$1,400,000
Establish a regional bicycle network	
19. Yankton to Volin	$4,325
20. Volin to Irene	$2,925
21. Irene to Lesterville	$7,500
22. Lesterville to Utica	$2,100
23. Utica to Yankton	$1,800

Truck route and the all-season, commercial route sections are similar.

Split between 11a and 11b reflects implementing from Utica to south as an All-season Commercial connection (same as #4 above) rather than as Truck Route. Utica north to SD 46 could still be implemented as Truck Route.

11c represents remaining length of 435th Ave from Utica to improvements associated with POSSIBLE Napa Junction transloading facility.



Strategy Alternatives for Cost Estimates

Figure 23

SRF Consulting Group, Inc.

YANKTON COUNTY MASTER TRANSPORTATION PLAN

Phasing

A comparison of available funds to the project cost estimates quickly reveals that there are not enough funds in the 25-year budget to pay for all of the examined improvements. In fact, the truck route along 444th Avenue alone is estimated to cost more than the entire 25-year budget. SRF experience in other counties suggests that conditions where a single project consumes the entire planning period budget, require an analysis to of the feasibility/utility provided by a phased implementation (split the project into multiple pieces). Feasibility of phasing generally requires each segment of the project to stand on its own and provide value to the county's transportation system independent of subsequent phases.

Of the highest cost projects, two were considered potential candidates for phasing under the aforementioned criteria:

- The truck route along 435th Avenue could be broken into two segments. The first segment would run between Utica and SD 50, providing independent utility by allowing all-seasons heavy vehicle access to Utica. The second phase would extend from Utica to SD 46.
- The James River crossing connecting 303rd Street to 304th Street and rebuilding the bridge along 303rd Street could be split into two phases, the first involving the rebuilding of the bridge. The second phase would include connecting the two roads. The rebuilt bridge would provide independent utility by improving safety and accessibility over the existing narrow structure.

With SD 50 and SD 46 being the only true logical termini that would provide independent utility for the 444th Avenue truck route, phasing was deemed impractical.

Available Funding

A central component of creating a program of improvement projects for the Transportation Master Plan is the evaluation of funds available to fund projects. The financial assessment is based on examination of annual county budgets from 2011 through 2013 and conversations with county officials.

Maintenance of the existing transportation system is of the utmost importance, and it will nearly always take priority over the construction of new projects. An overly aggressive budget that leaves inadequate funding for maintenance projects will result in a situation where few, if any, improvement projects can be implemented. Thus, a conservative approach was taken when developing this budget to ensure that the final project list is one that can realistically be implemented.

Critical Assumptions

Listed below are the critical assumptions that went into preparing the improvement plan budget estimate:

- **Designated Cash/Assigned Cash:** In one of the three years of budgets reviewed, Commissioners allocated assigned cash from the General Fund to the Road and Bridge Fund. These funds have been provided to the Highway Department to cover shortfalls in dedicated revenue sources such as property tax, wheel tax and intergovernmental transfers. According to the Auditor, assuming the Commissioners will assign additional cash is not sustainable over time. Thus, while some amount of Assigned Cash may be sustainable, a more modest number would need to be developed.
- **Secondary Roads**: This line item under the Tangible Goods category is intended for use on township roads in unorganized townships. While it does not show up in each of the budgets as being 100 percent expended in any of the years, it is 100 percent allocated. Thus, it is unavailable for use on improvements.
- **Personnel Services:** This fund is for labor and benefits for Highway Department personnel and should not be included in the budget from which improvement dollars are assigned.

Annual Average Revenue

Table 9 documents the revenue collected from the range of sources used to fund the Highway Department including the following:

- Taxes (Current year and delinquent)
- Intergovernmental transfers: Funds from state and federal sources that are allocated by formulas to Yankton County.
- Charges for goods and services the county performs for townships or along private roads and is paid to complete. While included in the revenue stream, these funds would not be available for even partial allocation to system improvements.
- Miscellaneous revenue: Includes interest and other minor amounts, but is also where Assigned Cash is identified.

Over the three years evaluated, revenue collected in the Road and Bridge Fund ranged from slightly over $2.3 million to more than $3.3 million, with the average for the period being approximately $2.7 million.

Table 8. Yankton County Annual Revenue 2012 Through 2014

	Annual Revenue			
Category/Expenditure	**2012**	**2013**	**2014**	**3-Year Average**
Taxes				
Current and Delinquent Property Tax	$319,126	$331,838	$344,504	$331,823
Penalty and Interest	$2,000	$2,000	$1,000	$1,667
Mobile Home Fees	$400	$400	$500	$433
Wheel Tax	$475,000	$477,500	$450,000	$467,500
Tax Deed	$0	$0	$0	$0
Category Subtotal	$796,526	$811,738	$796,004	$801,423
Intergovernmental Revenue/Transfers				
Bank Franchise Tax	$1,000	$1,000	$1,150	$1,050
Motor Vehicle Licenses	$1,356,600	$1,300,000	$1,300,000	$1,318,867
10% Game License Revenue	$8,500	$10,000	$10,000	$9,500
Prorate/Port of Entry Fees	$0	$85,000	$85,000	$56,667
Mobile Home Fees	$10,000	$101,000	$5,000	$38,667
1/4% of Motor Vehicle Fees	$100,000	$0	$95,000	$65,000
Motor Fuel Tax	$0	$3,000	$3,000	$2,000
Category Subtotal	$1,476,100	$1,500,000	$1,499,150	$1,491,750
Charges - Goods and Services				
Township Road Maintenance	$80,000	$40,000	$40,000	$53,333
Goods and Services	$18,500	$10,000	$9,000	$12,500
Category Subtotal	$98,500	$50,000	$49,000	$65,833
Miscellaneous Revenue				
Interest	$2,000	$2,000	$1,000	$1,667
Other	$1,000	$1,000	$500	$833
Designated/Assigned Cash	$964,121	$0	$0	$321,374
Category Subtotal	$967,121	$3,000	$1,500	$323,874
TOTAL REVENUE	$3,338,247	$2,364,738	$2,345,654	$2,682,880

Annual Average County Highway Department Budget

County Highway Department budget estimates for the three-year period from 2012 through 2014 were collected and used as the basis for determining funding that may be available to support improvements to the transportation system. Budget figures obtained from the County Auditor show the Highway Department expenditures divided into the following categories:

- **Personnel Services:** Reflects the labor and benefits of the county Highway Department staff members. Funds included in this category would be unavailable for use for the transportation system improvements covered in the Transportation Master Plan.
- **Operating Expenses:** This category covers material and services needed to maintain and improve the transportation system. It is the primary source of funds that could be assigned to projects that would be included in the Transportation Master Plan.
- **Tangible Goods**: These funds cover items that the county purchases to conduct its business and is also where the Auditor's office assigns funds for maintaining roads in the unorganized townships. Funds assigned to these categories are unavailable for improvements included in the Transportation Master Plan.

Table 9 documents the three years of expenditures assigned to each listed budget category and subcategory. Also included in the table are the assumptions of the percentage of each category's funds potentially available for the improvements projects developed in the Transportation Master Plan.

The following categories include with funds identified for use on improvement projects:

- **Professional Services: 100 percent** – Assumes these are funds that would pay for engineering services associated with an improvement.
- **Supplies: 50 percent** – Reflects the assumption that supplies associated with construction would be split approximately evenly between existing route maintenance and expansion of the existing system or new routes.
- **Annual Projects: 100 percent** – This category focuses on significant enhancements to the existing system (pavement, new lanes, shoulders, etc.) and new facilities. Thus, it is appropriate to assign all to the Transportation Master Plan project budget.
- **Bridges: 50 percent** – Reflects an assumption that the bridge budget would split evenly between maintenance projects for current bridges that are less than a replacement and replacement of bridges.

Table 9. Highway Department Expenditures 2012 – 2014 and Transportation Plan Budget

Category/Expenditure	Annual Budget				Percent For Plan Projects	Annual Dollars for Plan Projects
	2012	2013	2014	3-Year Average		
Personnel Services						
Salary	$874,030	$874,030	$744,816	$830,959	0%	$0
OASI	$54,190	$54,190	$57,489	$55,290	0%	$0
Medicare	$12,673	$12,673	$13,444	$12,930	0%	$0
Retirement	$52,442	$52,442	$55,635	$53,506	0%	$0
Workmen's Comp	$76,289	$76,289	$78,578	$77,052	0%	$0
Group Insurance	$94,130	$94,130	$111,074	$99,778	0%	$0
Unemployment	$0	$0	$0	$0	0%	$0
Category Subtotal	$1,163,754	$1,163,754	$1,061,036	$1,129,515		$0
Operating Expenses						
Insurance	$50,072	$50,072	$61,575	$53,906	0%	$0
Professional Services	$60,000	$60,000	$80,000	$66,667	100%	$66,667
Publishing	$300	$300	$390	$330	0%	$0
Rentals	$2,000	$2,000	$10,000	$4,667	0%	$0
Repair and Maintenance	$75,000	$75,000	$77,250	$75,750	0%	$0
Supplies	$500,000	$500,000	$800,000	$600,000	50%	$300,000
Highway Fuel	$340,000	$340,000	$400,200	$360,067	0%	$0
Travel	$600	$600	$2,400	$1,200	0%	$0
Utilities	$70,000	$70,000	$72,100	$70,700	0%	$0
Annual Projects	$700,000	$550,000	$462,604	$570,868	100%	$570,868
Dust Control	$65,000	$65,000	$66,950	$65,650	0%	$0
Emergencies	$25,000	$25,000	$25,750	$25,250	0%	$0
Bridges	$140,000	$140,000	$144,200	$141,400	50%	$70,700
Category Subtotal	$2,027,972	$1,877,972	$2,203,419	$2,036,454		$1,008,235
Tangible Goods						
Furniture and Minor Equipment	$600	$600	$0	$400	0%	$0
Machinery and Auto Equipment	$125,000	$125,000	$200,000	$150,000	0%	$0
Secondary Roads	$350,000	$350,000	$390,500	$363,500	0%	$0
Category Subtotal	$475,600	$475,600	$590,500	$513,900		$0
TOTALS	$3,667,326	$3,517,326	$3,854,955	$3,679,869		$1,008,235

Application of the listed percentages to the three-year average budget amount results in an annual Transportation Master Plan projects budget of approximately $1,000,000.

Alternate Funding Sources

Beyond looking at project costs, it is necessary to examine potential sources of funding besides traditional sources, including intergovernmental transfers. Examples of potential alternative sources of funding for projects that made it through the initial screening include the following:

- Signals on SD 52 at SD 153 and Deer Boulevard: SD 50 is under the jurisdiction of the South Dakota Department of Transportation (SDDOT) and it has been assumed that the SDDOT would fund signal improvements at these locations as long as warrants are met. Signal installation at these locations is ultimately dependent on meeting traffic warrants.
- The multi-use trail along Aspen Drive would be constructed by private developers through agreements with the County as the area southwest of Yankton sees additional residential and commercial growth.
- The opportunity for industrial development in the rural portion of the county remains strong. In cases where development generates heavy commercial vehicle traffic, the county supports pursuing cost-sharing plans for development-associated improvements to the transportation system to enhance access to industrial sites. When development-associated improvements occur on routes that also have the potential to serve as through truck routes or all-season routes between the smaller communities and the state highway network, the additional private funding support could result in a plan-identified project moving up the priority list.

Recent Legislation: Funding Enhancements

In March of 2015, the State of South Dakota passed legislation (Senate Bill 1) to increase funding for public roads and bridges through a variety of dedicated taxes and fees. **Table 10** outlines the funding enhancements put into place by the state legislature as well as their potential implications for funding county transportation projects. These funds are meant to augment current levels of transportation funding rather than supplant that funding.

Table 10. Funding Enhancements Passed by State Legislature

Fund	Source	Impact on County
State Highway Fund	Fuel Tax	No direct access to funds. Focused on state highways system.
Local Government Highway and Bridge Fund	License Fees	12% increase in license fees directly to county. Approximately $160,000 increase per year
Local Bridge Improvement Grant (BIG) Fund	License Fees, Fuel Taxes	$15 million per year available through competitive grants.

In addition to the funding enhancements listed above, the state legislature also expanded the options available to county and township governments to raise money specifically for transportation projects. **Table 11** displays these optional actions as well as their potential for generating revenue. Each county, including Yankton County, will need to determine which of these opportunities to pursue and how to allocate the increased revenue to maintenance and improvement projects included in the transportation master plan.

Table 11. Optional Local Actions

Action	New Provisions	Potential Annual Revenue
County Property Tax	Counties can levy an additional $0.90 per $1,000 valuation for bridge and highway projects.	Up to $1.4 million
Township Property Tax	Organized townships can levy an additional $0.50 per $1,000 valuation for bridge and highway projects.	Varies by township.
County Wheel Tax	Counties can collect up to $5 per wheel on up to 12 wheels. (Up from $4 per wheel on up to four wheels.) Yankton County currently collects $4 per wheel.	$100,000+

Roadway Design Standards

Yankton County Highway Department presently uses the Local Roads Plan prepared by the SDDOT, which a document that is to be used in concert with the AASHTO publication, "A Policy on Geometric Design of Highways and Streets," the SDDOT Road Design Manual, and other applicable policies and publications for completing road design. One of the key products the county would like to develop as part of this transportation plan is a set of guidelines/standards for the range of county roads required to serve needs in the county.

Diversity in rural area development within Yankton County has created the desire to address the travel needs of pedestrians and bicyclists as well as autos and trucks in rural areas of the county. While each mode of travel needs to be considered in all corridors, it is not generally appropriate/reasonable to accommodate all modes in every corridor. It is the county's desire to differentiate the primary and secondary corridor functions in the county network based on surrounding land uses and activities a route would connect. The result of this effort as it relates to developing design guidelines/standards is create a series of cross sections that support the following primary functions:

- Freight movement within and through the county. These routes would be intended to emphasize supporting heavy commercial truck travel and de-emphasize pedestrian and bicycle travel.
- Multimodal travel. While it is likely that vehicle travel is the most prevalent mode in every corridor, there is a local understanding that with residential and recreational development in the rural areas of the county some corridors should be designed to actively accommodate pedestrian and bicycle travel. These corridors would be located adjacent to rural residential subdivisions and along access routes to recreational activity areas. Understanding there is not likely the demand or funding available to consider detached multi-use trails, these routes would accommodate non-motorized travel through a wider, paved shoulder.

In general, this effort has focused on preparing cross section information for corridors providing the following functions:

- Truck Routes – Represent a limited number of major collector routes in the county designed to accommodate heavy commercial vehicles throughout the year (no spring weight restrictions).

- Multimodal Routes – These are representative of roads where pedestrians and bicycles would be accommodated on the shoulder. These routes would be located adjacent to higher density residential areas or along routes to recreational areas. Trucks would be discouraged from using these routes unless they are accessing properties directly adjacent to the route.
- Non-truck routes – These routes would account for the vast majority of the county paved miles. The intent would be that auto travel would be the highest priority function. Routes would include limited paved (if any) shoulder. Pedestrian and bicycle travel would be accommodated by sharing the lane with vehicle traffic. The routes would carry lower volumes of traffic and truck traffic would be discouraged.

Typical Cross Sections

It is important for any road authority to adopt and utilize a consistent set of road design standards to ensure uniformity in the transportation system, while considering safety and future needs. As existing rural roadways and rural collectors under Yankton County jurisdiction are upgraded, or as new roadways are constructed, the cross section information highlighted in **Table 12** should be referenced.

Table 12. Typical Cross Sections

Category	Lane Width (Feet)	Surface Depth (Inches)	Shoulder		Rumble Strips	Inslope Ratio
			Type	Width		
Paved Routes						
Collector – Truck Route	12	8-10	Paved[10]	8	Yes	4:1
Collector – Non-Truck Route	12	6-8	Paved/ Gravel	2/6	No	4:1
Collector – Multimodal Route	12	4-6	Paved	4-6	No	4:1
Gravel Routes[11]						
0 to 5 Trucks Per Day		5.5				4:1
5 to 10 Trucks Per Day		7.0				4:1
10 to 25 Trucks Per Day		9.0				4:1
25 to 50 Trucks Per Day		11.5				4:1

[10] Shoulder thickness for Truck Route same as travel lane

[11] Assumes Medium subgrade conditions. Lower conditions – Increases gravel thickness. Higher conditions – Lowers gravel thickness

Recommendations

This chapter of the Transportation Master Plan outlines recommendations for transportation system improvements. The projects and policies were developed in direct response to the issues identified by Yankton county residents and workers and reflect the goals identified at the beginning of the plan making process.

While this plan estimated an annual budget for improvement projects in the *Funding Analysis* chapter, the uncertainty around the precise availability of funds for improvement projects between now and 2040 makes presenting a specific list of projects to implement during that timeframe inappropriate. Rather, this plan offers a prioritized list of improvement projects from which the county can choose to implement projects based on the availability of funds. The relative priority of the projects suggests an approximate order of implementation.

In addition, because the cost of replacing structures significantly impacts the availability of funds for other projects, this plan offers three scenarios for improvement project implementation built around the rate of structure replacement: two per year, one per year, and one every three years.

Prioritization

The initial round of screening produced a list of projects, all of which fit within Yankton County's collective goals and would help to address its identified issues. The cumulative cost of the project list far outpaces available funding for transportation improvements. Thus, the projects on the list underwent additional review in order to establish their relative priority.

Projects were prioritized based on cost, utility provided to Yankton County residents and businesses, and the general support observed through the public engagement process. Projects were sorted into three categories to allow for comparisons between individual projects that supported a specific issue/gap. Categories include:

- Regional Connection Projects.
- Truck Routes.
- Enhancement Projects.

The prioritization occurred through technical analysis from the project team and conversations with county staff and other members of the SAT. **Table**

13 displays the established priorities. Projects are prioritized in each of the categories, but not across categories, and are listed in order of priority.

The priority table is intended to provide a "menu" of projects to consider as funding becomes available. Priorities are based on current knowledge of existing conditions, funding sources, and local preferences. However, project ranking could fluctuate throughout the lifetime of this plan (through 2040) based on a changing understanding of the county's needs or changes in funding available.

A sampling of the rationale used in the prioritization process for each category is presented below.

Table 13. Project Priority List

Regional Connection Projects	
Project Description	**Total Cost**
6. All-season Access: Mission Hill - 446th Ave/309th St/East Side Drive	$10,338,800
1. All-season Access: Lesterville - 430th Ave to SD 46	$5,552,300
4. All-season Access: Utica - 435th Ave to SD 50	$9,248,600
8. All-season Access: Volin - 451st Ave, 310th St, and 450th Ave to SD 50	$12,370,500
9. All-season Access: Gayville – 450th Ave to SD 50	$1,723,100
10. Cross James River: Connect 304th St to 303rd St	$6,543,700
Truck Routes	
11a. Truck Route: 435th Ave from Utica to SD 50	$9,248,600
11b. Truck Route: 435th Ave from SD 46 to Utica	$14,035,100
12. Truck Route: 444th Ave from SD 46 to SD 50	$28,144,600
Management and Enhancement Projects	
19. Regional Bike Route: Yankton to Volin	$4,325
20. Regional Bike Route: Volin to Irene	$2,925
21. Regional Bike Route: Irene to Lesterville	$7,500
22. Regional Bike Route: Lesterville to Utica	$2,100
23. Regional Bike Route: Utica to Yankton	$1,800
14. Signalize Intersection: SD 52/SD 153	$125,000
15. Signalize Intersection: SD 52/Deer Blvd	$125,000
13. Recreational Vehicle Route: 435th Ave	$2,975
17. Multiuse Trail: North side of SD 52, west of SD 153	$560,000
16. Multiuse Trail: SD 153 from Kaiser Rd to SD 52	$320,000

Note: Projects appear in order of priority. The number next to each alternative refers to project numbering used in Figure 23 and does not reflect project priority.

Regional Connection Projects

Of the regional connection projects, the all-season routes were given highest priority due to the potential for economic benefit they offer communities in Yankton County. Of the multiple routes considered in earlier stages of project screening, one was selected for inclusion in the prioritized list for each community based on cost and utility. Connections to each of the communities were prioritized against each other based on the potential for economic growth, project cost, community population, and the potential of the project to help address other previously identified issues. The Mission Hill connection was selected as the highest priority project due to its potential for supporting heavy vehicle traffic, the dual category of supporting a part of an east side truck route, and an all-season commercial connection to Mission Hill. The project would also further the investment placed in the already scheduled bridge replacement over the James River along 309th Street (Old Highway 50).

The Lesterville connection was viewed as the next highest priority due to heavy vehicle traffic generated by agricultural facilities in town, but the Utica connection follows close behind. The latter could help support the development of Napa Junction, and private sector investment in a segment of 435th Avenue could move it up in the list of priorities. The Volin and Gayville connections follow behind the others.

Improving the connection across the James River has been preliminarily designated the lowest priority in this category due to low benefit relative to the cost and limited support it received at public meetings.

Truck Routes

Two truck routes remain under consideration and each runs between SD 46 and SD 50 on 435th Avenue and 444th Avenue, respectively. Both routes are very high cost in their entirety, but the possibility of phasing along the 435th Avenue route as well as its support of all-season, commercial access to Utica give it higher priority in this improvement group. The 444th Avenue route was listed as a lower priority because segmentation into more cost-manageable phases provides relatively low independent utility. Additionally, the estimated cost for the entire project is greater than the entire 25-year budget under consideration in this plan.

Enhancement Projects

The enhancement projects have significantly lower costs than the other two categories of projects. Thus, while they might have lower priority in general than many the more impactful projects being considered, they have a greater

likelihood of being implemented sooner due to their lower costs. Of these projects, the regional bicycle route connecting all of the county's communities has been initially listed as the highest priority, primarily due to its low cost and ease of implementation. Each leg of the route has not been prioritized relative to other legs of the route.

The signalized intersection at SD 52 and Deer Boulevard will be a useful project, but the traffic growth required to meet warrants for its installation moves the project lower on the list of priorities. The new multiuse trails are lowest priority in this category since they are somewhat dependent on a signal at SD 52 and SD 153 to safely connect to trails on the south side of SD 52.

As noted above, the signal at the intersection of SD 52 and SD 153 will likely be provided by SDDOT once warrants are met, and the multiuse trail along Aspen Drive can be built through development agreements once the area begins to see additional growth.

County Highway Improvement Plan

A significant ongoing cost that will dramatically impact the availability of funds for other transportation projects is the replacement of bridges and culverts. Currently, Yankton County replaces approximately two structures 60 feet or shorter per year at a cost of $250,000 per structure.

Presently, 17 structures under county jurisdiction are at least 75 years old. If no structures were to be replaced, that number would increase to 46 by 2040. Given the impact of structure replacement on the county's overall transportation budget, this Transportation Master Plan offers the following three scenarios of structure replacement relative to individually identified projects related to the county's identified goals and issues:

- **Scenario A –** Two structures per year (**Table 14/Figure 24**). Those projects listed shown in each section of the table as light gray would be beyond the funding remaining after the number of structures included in this scenario are addressed. In this scenario, no structures would exceed the 75-year estimated useful life.
- **Scenario B –** One structure per year (**Table 15/Figure 25**). Those projects listed shown in each section of the table as light gray would be beyond the funding remaining after the number of structures included in this scenario are addressed. In this scenario, approximately 21 structures would exceed the 75-year estimated useful life by the end of the planning horizon.

- **Scenario C-1 –** Five structures every three years (**Table 16/Figure 26**). Those projects listed shown in each section of the table as light gray would be beyond the funding remaining after the number of structures included in this scenario is addressed. In this scenario, approximately four structures would exceed the 75-year estimated useful life by the end of the planning horizon.

An additional scenario, Scenario C, was developed based on the premise that only one structure would be replaced every three years. Under Scenario C, only nine structures would be replaced over the next 25 years, leaving 37 structures over 75 years old at the end of the planning horizon. This scenario was dismissed as a result of public comments received at the public meeting of March 23, 2015. There was consensus among attendees that such a scenario would not meet the county's needs. The details of Scenario C can be found in *Appendix F*. A summary of the public meeting appears in *Appendix G*.

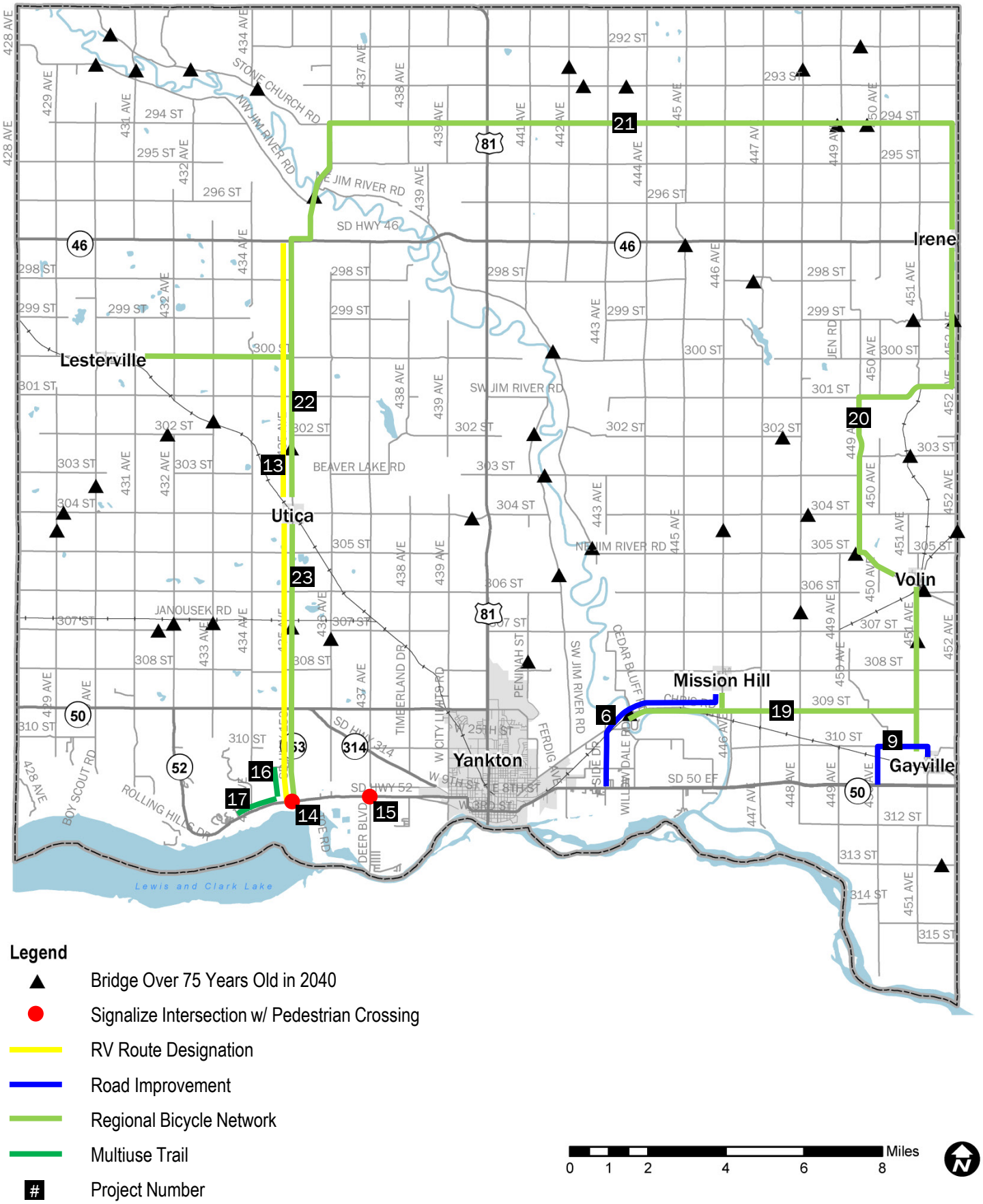
As a result of the dismissal and other comments regarding the importance of the Regional Connection to Lesterville, Scenario C-1 was developed.

Annually, the county will review the project list relative to funding available and select from the list projects to be implemented over the next year and confirm the priority and timing of projects that require additional funding. The product of this review will be documented consistent with the requirements to maintain grant eligibility for state bridge and highway funds.

Table 14. Scenario A - Planned Projects with Two Structures Replaced per Year

Regional Connection Projects	
Project Description	**Total Cost**
6. All-season Access: Mission Hill - 446th Ave/309th St/East Side Drive	$10,338,800
1. All-season Access: Lesterville - 430th Ave to SD 46	$5,552,300
4. All-season Access: Utica - 435th Ave to SD 50	$9,248,600
8b. All-season Access: Volin - 451st Ave to 310th St	$8,349,860
8a/9. All-season Access: Gayville – 450th Ave to SD 50	$3,829,200
10. Cross James River: Connect 304th St to 303rd St	$6,543,700
Priority Corridor Projects	
11a. Truck Route: 435th Ave from Utica to SD 50	$9,248,600
11b. Truck Route: 435th Ave from SD 46 to Utica	$14,035,100
12. Truck Route: 444th Ave from SD 46 to SD 50	$28,144,600
Management and Enhancement Projects	
19. Regional Bike Route: Yankton to Volin	$4,325
20. Regional Bike Route: Volin to Irene	$2,925
21. Regional Bike Route: Irene to Lesterville	$7,500
22. Regional Bike Route: Lesterville to Utica	$2,100
23. Regional Bike Route: Utica to Yankton	$1,800
14. Signalize Intersection: SD 52/SD 153	$125,000
15. Signalize Intersection: SD 52/Deer Blvd	$125,000
13. Recreational Vehicle Route: 435th Ave	$2,975
17. Multiuse Trail: North side of SD 52, west of SD 153	$560,000
16. Multiuse Trail: SD 153 from Kaiser Rd to SD 52	$320,000
Total Improvement Project Costs	**$13,213,525**
Number of Structures Installed	50
Cost per Structure	$250,000
Cost of Structures Replaced over 25-Year Period	$12,500,000
Total Costs of All Projects	**$25,713,525**
Total 25-Year Improvement Budget	$25,000,000
Dedicated Structure Installation Budget	$1,767,500
Total Budget Available for Projects	**$26,767,500**
Remainder of Budget	$1,053,975

Note: Grayed text represents projects not implemented.



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YANKTON COUNTY MASTER TRANSPORTATION PLAN

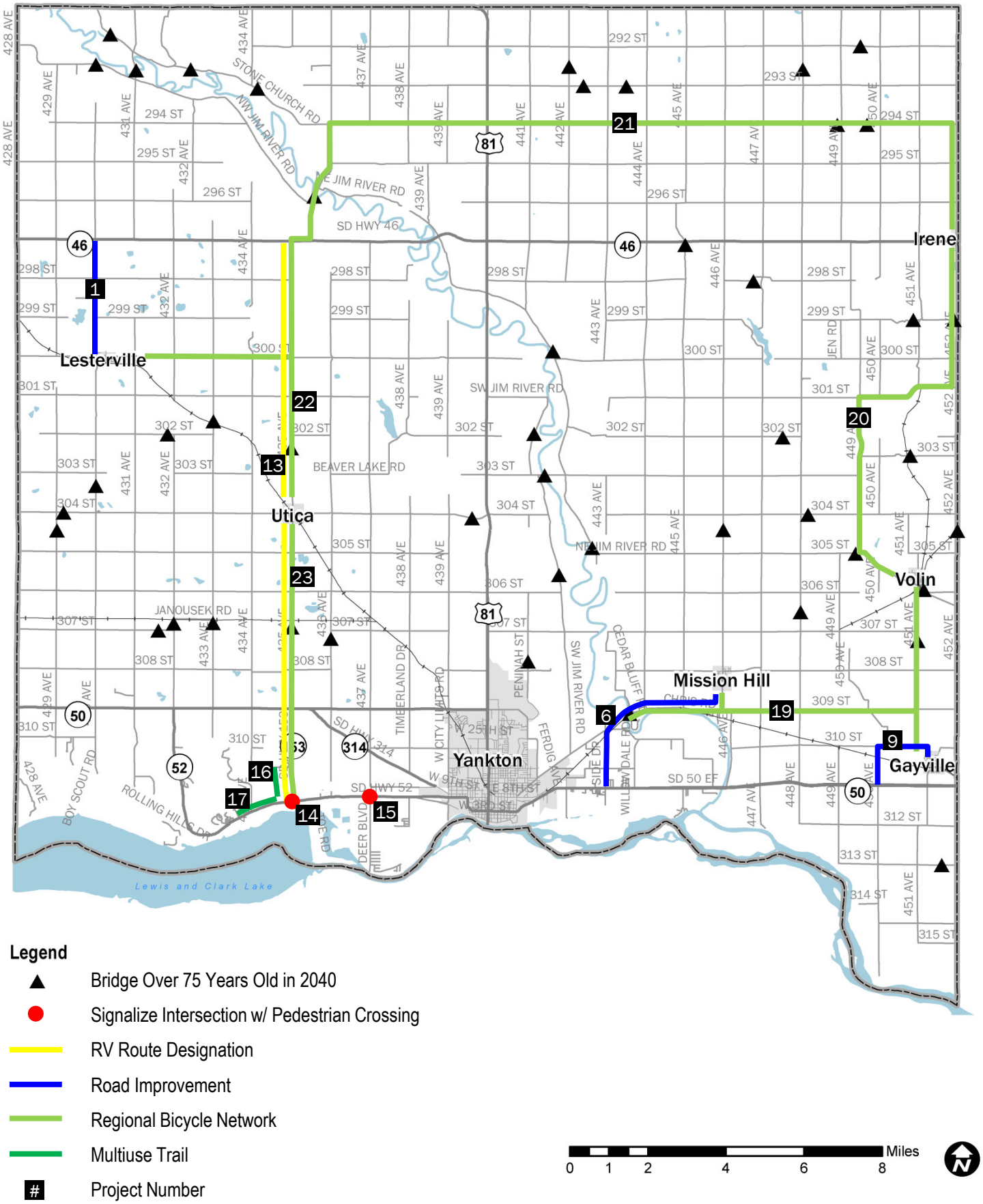
Scenario A: Replace 2 Structures per Year

Figure 24

Table 15. Scenario B: Planned Projects with One Structure Replaced per Year

Regionally Dispersed Projects	
Project Description	**Total Cost**
6. All-season Access: Mission Hill - 446th Ave/309th St/East Side Drive	$10,338,800
1. All-season Access: Lesterville - 430th Ave to SD 46	$5,552,300
4. All-season Access: Utica - 435th Ave to SD 50	$9,248,600
8. All-season Access: Volin - 451st Ave, 310th St, and 450th Ave to SD 50	$12,370,500
9. All-season Access: Gayville – 450th Ave to SD 50	$1,723,100
10. Cross James River: Connect 304th St to 303rd St	$6,543,700
Priority Corridor Projects	
11a. Truck Route: 435th Ave from Utica to SD 50	$9,248,600
11b. Truck Route: 435th Ave from SD 46 to Utica	$14,035,100
12. Truck Route: 444th Ave from SD 46 to SD 50	$28,144,600
Management and Enhancement Projects	
19. Regional Bike Route: Yankton to Volin	$4,325
20. Regional Bike Route: Volin to Irene	$2,925
21. Regional Bike Route: Irene to Lesterville	$7,500
22. Regional Bike Route: Lesterville to Utica	$2,100
23. Regional Bike Route: Utica to Yankton	$1,800
14. Signalize Intersection: SD 52/SD 153	$125,000
15. Signalize Intersection: SD 52/Deer Blvd	$125,000
13. Recreational Vehicle Route: 435th Ave	$2,975
17. Multiuse Trail: North side of SD 52, west of SD 153	$560,000
16. Multiuse Trail: SD 153 from Kaiser Rd to SD 52	$320,000
Total Improvement Project Costs	**$18,765,825**
Number of Structures Installed	25
Cost per Structure	$250,000
Cost of Structures Replaced over 25-Year Period	$6,250,000
Total Costs of All Projects	**$25,015,825**
Total 25-Year Improvement Budget	$25,000,000
Dedicated Structure Installation Budget	$1,767,500
Total Budget Available for Projects	**$26,767,500**
Remainder of Budget	$1,751,675

Note: Grayed text represents projects not implemented.



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YANKTON COUNTY MASTER TRANSPORTATION PLAN

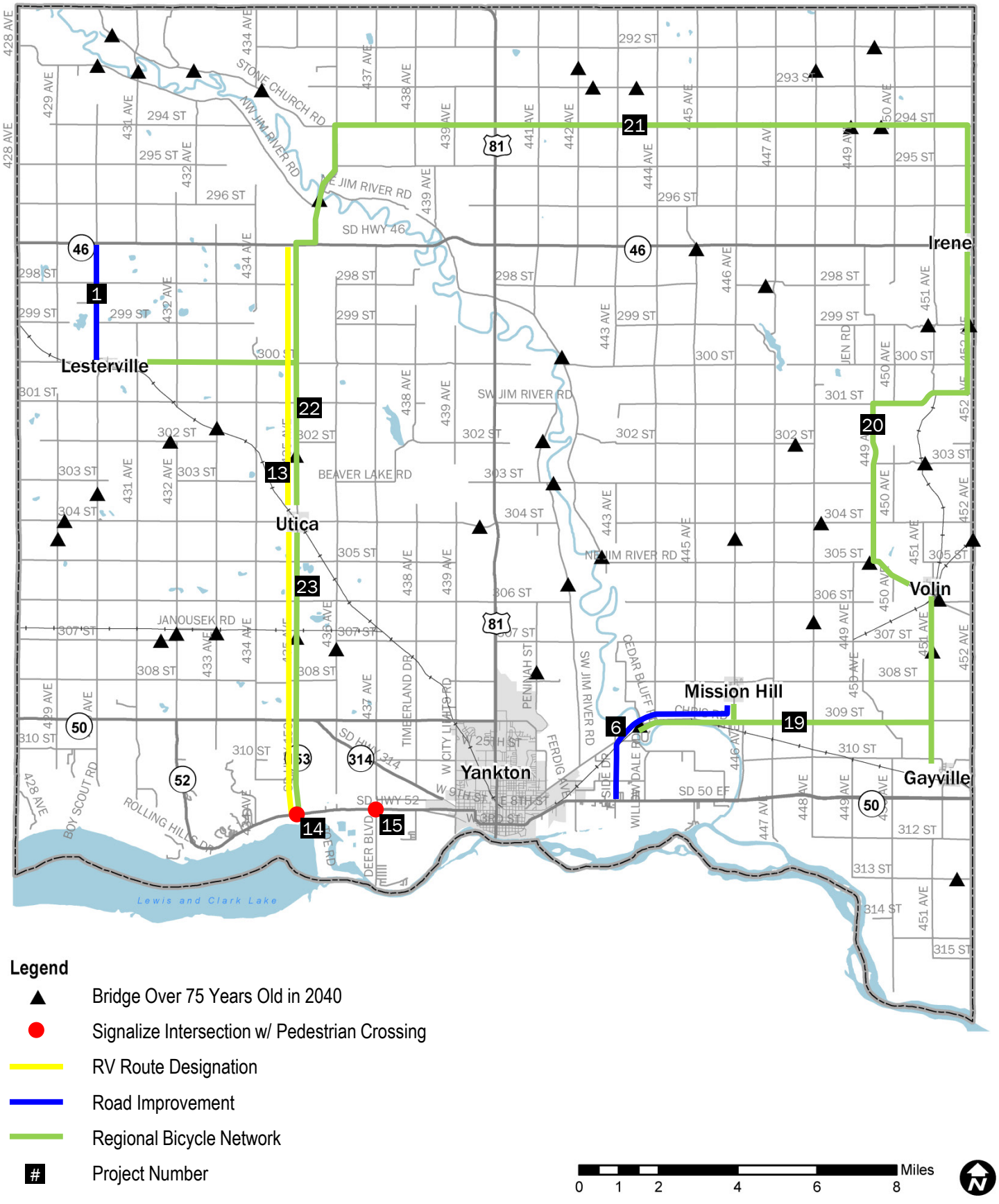
Scenario B: Replace 1 Structure per Year

Figure 25

Table 16. Scenario C-1: Planned Projects with Five Structures Replaced Every Three Years

Regionally Dispersed Projects	
Project Description	**Total Cost**
6. All-season Access: Mission Hill - 446th Ave/309th St/East Side Drive	$10,338,800
1. All-season Access: Lesterville - 430th Ave to SD 46	$5,552,300
4. All-season Access: Utica - 435th Ave to SD 50	$9,248,600
8. All-season Access: Volin - 451st Ave, 310th St, and 450th Ave to SD 50	$12,370,500
9. All-season Access: Gayville – 450th Ave to SD 50	$1,723,100
10. Cross James River: Connect 304th St to 303rd St	$6,543,700
Priority Corridor Projects	
11a. Truck Route: 435th Ave from Utica to SD 50	$9,248,600
11b. Truck Route: 435th Ave from SD 46 to Utica	$14,035,100
12. Truck Route: 444th Ave from SD 46 to SD 50	$28,144,600
Management and Enhancement Projects	
19. Regional Bike Route: Yankton to Volin	$4,325
20. Regional Bike Route: Volin to Irene	$2,925
21. Regional Bike Route: Irene to Lesterville	$7,500
22. Regional Bike Route: Lesterville to Utica	$2,100
23. Regional Bike Route: Utica to Yankton	$1,800
14. Signalize Intersection: SD 52/SD 153	$125,000
15. Signalize Intersection: SD 52/Deer Blvd	$125,000
13. Recreational Vehicle Route: 435th Ave	$2,975
17. Multiuse Trail: North side of SD 52, west of SD 153	$560,000
16. Multiuse Trail: SD 153 from Kaiser Rd to SD 52	$320,000
Total Improvement Project Costs	**$16,162,725**
Number of Structures Installed	42
Cost per Structure	$250,000
Cost of Structures Replaced over 25-Year Period	$10,500,000
Total Costs of All Projects	**$26,662,725**
Total 25-Year Improvement Budget	$25,000,000
Dedicated Structure Installation Budget /SDDOT Signals	$2,017,500
Total Budget Available for Projects	**$27,536,500**
Remainder of Budget	$873,775

Note: Grayed text represents projects not implemented.



Scenario C-1: Replace Five Structures Every Three Years

Figure 26

SRF Consulting Group, Inc.

YANKTON COUNTY Master Transportation Plan

Five-Year County Bridge Improvement Plan

Yankton County continually assesses structures and facilities in its road system and annually determines its program of structure preservation and replacement. The county's proposed five-year highway and bridge improvement plan includes replacement of the structures listed in Table 17.

Table 17. Five-Year County Bridge Improvement Plan

Structure #	Critical Need	Length	Width	Road Surface	Truck Route	Estimated Cost
68-132-109	Y	23.9'	26'	Gravel	N	$220,000
68-217-030	Y	30.0'	34'	Asphalt	N	$235,000
68-230-162	Y	32.0'	34'	Asphalt	Y	$240,000
68-155-020	N	22.0'	26'	Gravel	N	$215,000
68-215-010	N	28.8'	26'	Gravel	N	$230,000
68-040-158	N	22.2'	26'	Gravel	N	$215,000
68-202-130	N	39.0'	26'	Gravel	N	$240,000
68-170-061	N	30.0'	26'	Gravel	N	$230,000
68-070-158	N	36.0'	34'	Asphalt	Y	$245,000
68-230-159	N	50.0'	34'	Asphalt	Y	$270,000

Epilogue

Beyond the improvement projects detailed in the preceding chapters, public comments and conversations with the SAT and Stakeholders Committee suggest the need for a policy to aid county commissioners in responding to requests to bring additional mileage into the county system.

In addition, the competing pressures of implementing improvement projects and replacing aging structures could lead to a situation where the county would need to consider closing a crossing.

This chapter briefly discusses the criteria the county ought to consider when considering bringing more mileage into the county system or closing or removing a structure without replacing it. In general, either action should be kept to a minimum.

County System – Addressing Requests for Adding Segments

The concept of defining criteria for characterizing routes that while not on the county system may function as a route consistent with those on the county system was included in the October 23, 2014 memorandum addressing alternatives. The purpose of preparing the criteria was that the county periodically gets requests from rural area property owners that gain access to their property via off-system routes for assistance in rehabilitating and/or maintaining access roads. Since 1976 the county has had a commission resolution stating no more mileage would be accepted into the system. Over the years, there have been several instances where this resolution was not followed, which today creates conflicts when requests are made and commissioners and staff reference the 1976 action.

A principal concern is that without establishing a road improvement district or assigning a special assessment to benefited properties, adding off-system miles does not bring additional revenue to pay for capital improvement and ongoing maintenance costs. On a segment-by-segment basis the incremental cost of adding more mileage to the system may not be prohibitive for the county, however, the cumulative effects over time of possibly adding dozens of miles would likely result in the need to pull funding from other programs or increase mill levies. Thus, to address both the inconsistencies of the past and to allow some leeway by commissions to consider adding mileage to the county system, a set of guidelines as to acceptable conditions and a process for requesting action is needed.

Expending county funds on these routes, however, could be construed as the county taking responsibility for them (as it would be difficult to justify making a one-time payment to rehabilitate a road without figuring out how to also fund maintaining it at a reasonable condition), which almost by default assumes the county would accept more miles.

The purpose of this memorandum is to identify additional details regarding:

- How a request for being added to the county system would be initiated.
- Actions required by the County Commission to the South Dakota Secretary of Transportation to request a change to the county system.
- What costs would be reasonable without requesting additional funding from those property owners that benefit.
- Future consideration of need for additional improvements in a corridor.

Requesting Consideration by the County to Accept a Route

Procedural Steps

Listed below are the key steps in a process for initiating an action to ADD mileage to the county system:

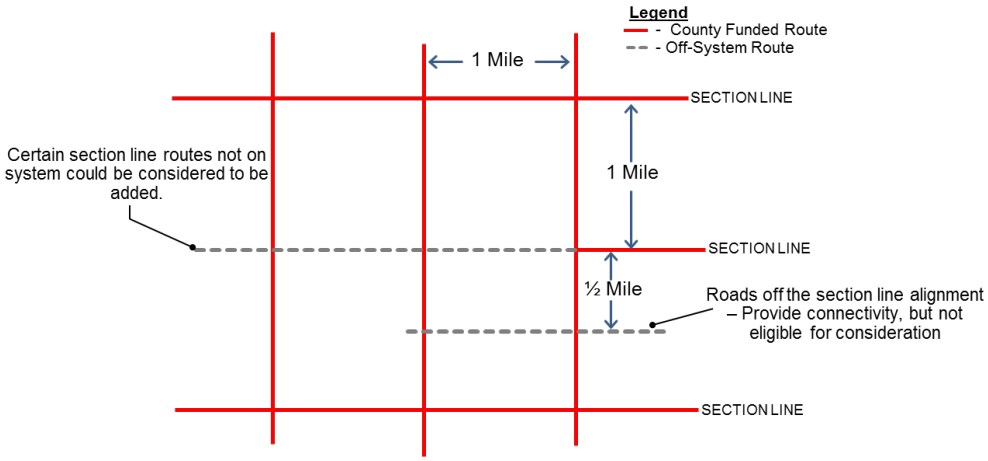
- Action must be initiated by a landowner along a segment of roadway outside the county system and NOT under the jurisdiction of an organized township. A form outlining the elements/steps/requirements needs to be developed by the county. This form should include a flyer highlighting the key elements considered, requirements of landowners and a protest process.
- The property owner initiating the request must get signatures from 75% of the property owners along the designated section of their support of the request. This step is considered critical as the planning and design actions by the county will require an investment and there must be a substantial level of involvement and knowledge of the conditions by people in the corridor. (Note: An acceptable percentage needs to be discussed with county staff).
- The request would be submitted to either the county highway superintendent or the planning and zoning administrator to be presented to the county commissioners. (One position should be designated).
- For a request that has the appropriate percentage of signatures, county staff will apply the distance, continuity, development density and traffic volume tests to the segment of road in question. These criteria are outlined in the next section.

- For segments that satisfy the thresholds, county staff will submit the segment to the county commissioners for consideration.
- For those segments that meet positive action by the County Commission, SDCL 31-12-2 requires the Board of County Commissioners develop a resolution stating the desired addition (deletion) of mileage to the county highway system. Thus, for requests supported by the County Commissioners, a resolution containing the following will be prepared and presented to the Secretary of Transportation for the State:
  - Description of the route.
  - Reason or rational for making the modification.
  - Map of the current system and the limits of the proposed change (addition/deletion).
  - A sample resolution is attached on the next page.
- For requests that receive a positive response from the Secretary of Transportation, the County Commissioners will direct the county highway superintendent to initiate actions to address needs within the corridor proposed to be added to the county system, including timing of improvements based on the need relative to other road improvements in the county and funding availability.

Candidate Corridor Evaluation Criteria

Listed below are an initial set of criteria that could be used in evaluating whether it is appropriate to bring a route under the county's maintenance/funding jurisdiction:

- Location of the roadway relative to a defined section line: Roads under the county's funding jurisdiction are primarily section line roads or, as some routes adjacent to the James River, diagonal routes that connect section line routes. A route requested to be brought under the county's jurisdiction should represent a similar facility to current county routes. Thus, would be limited to those that represent section line roads.
- Level of continuity: A route under the county's jurisdiction needs to serve a public benefit, which in the transportation network is a route that provides mobility for more than those properties directly adjacent to it. For the purposes of this analysis, for a road to provide a public benefit, it must provide connectivity between two section line county roads. Thus, it must be at least one mile long.



- Those that benefit most must take on most of the burden: Adding a segment of road to the county system must not simply be a transfer of the maintenance cost burden from adjacent land owners that use the road to others in the county that have no real reason/ purpose to use the roadway. Thus, there must be a reasonable number of developed properties along the segment to generate tax dollars commensurate with the benefit they are provided. A suggested threshold for consideration is the route must provide access to a minimum of 10 properties per mile. This threshold reflects a level required to generate a substantial portion (but not necessarily all) of the maintenance cost burden.
- Daily traffic volume: As the intent is not to extend the county's responsibility to cover local roads that only provide access to adjacent properties, but rather to those roads that serve a public benefit, roads considered should carry at least 75 vehicles per day. This threshold is representative of a route that would provide access to 10 to 12 residential properties and carry some level of through traffic.

The primary reason for residents to request the county assume responsibility for maintenance of their currently private roads is residents do not have the means to obtain financing from traditional private means to fund road maintenance. Alternates to the county assuming responsibility for the mileage (including financing maintenance) that would yield mechanisms for obtaining longer term financing that could be considered are:

- Landowners have the ability to establish a road district to fund road construction and maintenance under South Dakota state law (Chapter 31-12A).
- The county could assist in developing a funding mechanism to split maintenance costs among its primary users. While landowners currently have the option of incorporating into a road district, the county could

help establish a new system to help landowners pay for road construction and maintenance while avoiding the difficulties of incorporation. Mechanisms to consider include development impact fees and special assessments.

Corridor Concept

At this point it has been assumed that the off-system routes would all be gravel roads rather than paved roads. Thus, from a cost standpoint at most the county would consider rehabilitating:

- The subsurface to accommodate a gravel surface and provide acceptable drainage.
- Applying a gravel surface.
- Maintaining the surface consistent with other routes presently on the county system.
- No bridges or culverts in excess of ## feet would be accepted. (Note: An acceptable structure length needs to be discussed with staff).

Consideration of Future Improvements

In all likelihood routes requested to be brought into the system will be routes where rural residential development is occurring. In addition, improving what is likely a relatively poor condition roadway could lead to additional rural residential development in the improved corridor. As a gravel route requires an increasing level of maintenance as traffic volume increases, and many counties find it cost effective to upgrade to a paved surface when daily traffic exceeds approximately 170 to 200 vehicles per day, and the capital cost associated with paving is substantially greater than paving, included in the petition of being brought into the county system could/should include the stipulation that:

- Residents acknowledge that they have been informed prior to signing the petition and agree that:
  - County funding assumes only a gravel road.
  - The county will not accept continued use of a gravel surface on routes carrying more than 170 to 200 vehicles per day, as the cost of maintenance becomes prohibitive.
  - If the route daily traffic exceeds 170 to 200 vehicles per day, the route will be paved and the **cost of paving will be shared by the residents benefitted** by the improvement. Determination of benefit will be based on:

- Establishing a balance of through versus local access traffic. Local traffic is the daily traffic in/out of the properties directly adjacent to the roadway with driveways to the road. For residential properties a standardized daily trips per property would be established. Local traffic would be quantified by multiplying the number of properties by the standardized trip rate (to be determined). Through traffic would be the total daily count, less local traffic.
- Percentage of frontage for individual properties relative to the length of the corridor. For example, if there are 10 properties fronting both sides a road over a mile of road that is being considered and one property has 500 feet of frontage, the property owner would be responsible for approximately 10% (500/5280 = 9.5%) of the local benefit cost.
- Cultivated field frontage would not be included in the cost allocation for paving.
- The county will accept responsibility for the portion of paving costs associated with the through traffic benefit.
- Owners of properties along the route would be responsible for paying the paving costs for their share of the local benefit.

Criteria for Considering Bridge Closure

The purpose of this section is to document a set of criteria for the County's consideration in selecting bridges to close should the need arise. The intent of the criteria is to provide the County with a sound basis for selecting between two or more structures in the event they are required to do so because there is not adequate funding to rehabilitate/replace bridges that are no longer safe to use. The criteria identified reflect that the critical decision to close a bridge/structure is not just based on economics of added travel associated with the detour route, there are also social implications associated with the accessibility provided by a bridge (or reduced if a critical bridge is removed).

Range of Evaluation Criteria

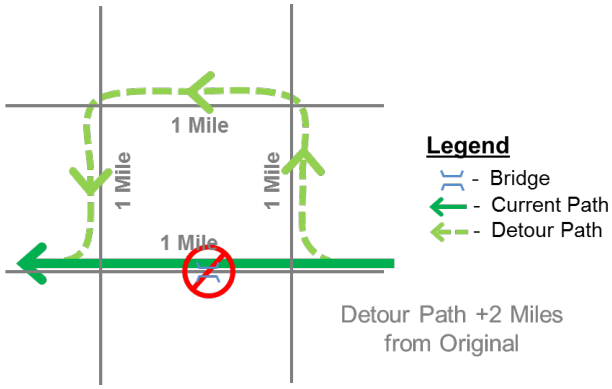
Central to the decision to determining actions relating to bridges in need of a significant investment the desire to maintain a safe transportation network for the movement of people and goods, however, there are also economics questions that need to be addressed to support where in the system limited resources are directed. The criteria suggested for selecting bridges to be closed rather than rehabilitated/replaced are focused more on the economics

portion of the equation, with some consideration for the land access (social element) provided by a bridge.

Listed below are a proposed set of criteria for aiding the county in determining an appropriate course of addressing bridge needs along with the range of other transportation system needs.

Volume Relative to Detour Distance

Closing a bridge almost exclusively results in increasing the travel miles for some group of travelers in the county. The added miles increase the transportation costs for each of the trips that would need to use the alternate route(s) due to the closure. Assuming the decision of whether to invest funds into



rehabilitation/replacement is a straight economic assessment, understanding the relationship between the capital replacement/ rehabilitation cost to the accumulated daily detour travel cost allows for developing a decision process. Factors influencing the decision process include:

- Replacement/rehabilitation cost for bridge.
- Typical life span of the replacement structure.
- Detour mileage by vehicle classification, typically divided into autos and trucks. These categories are separated because of differences in the per mile operating cost.
- Operating cost per mile for each vehicle type.
- Daily traffic by vehicle classification using the bridge today.

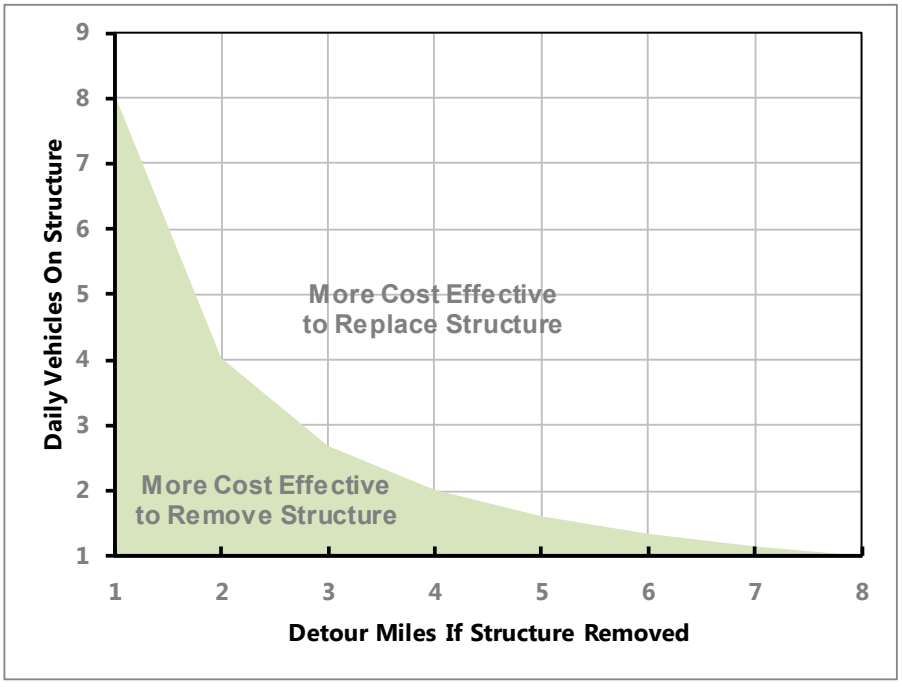
Understanding each of the listed factors will allow for assessment of the incremental detour operating costs relative to the replacement costs. To complete the comparison, replacement/rehabilitation capital costs are annualized and the incremental operating costs for the detoured trips are summed to an annual level. An example is provided below:

- Replacement cost for a bridge: $150,000 (assumes a 25 foot long 30 foot wide structure at a replacement cost of $200 per square foot).

- Life span: 75 years.
- Annualized capital cost for replacement: $2,000 (replacement cost divided by life span).
- Detour added travel: 2 miles. For this example only.
- Vehicle classification split: 80 percent autos-20 percent trucks. For this example only. Unique splits can be calculated for each location being considered.
- Vehicle operating cost per mile: Auto - $0.60/Truck - $1.00.

The last variable required for the assessment is daily traffic. In this analysis, as traffic volume increases, the incremental increase in vehicle miles of travel and the associated incremental operating cost will result in the replacement project being more cost effective. Figure 1 displays the results of evaluating the incremental operating costs of closing a bridge and detouring traffic to a longer path around the bridge relative to the annualized replacement cost of the bridge. From the figure, replacing the bridge, in this example, would be more cost effective when daily volume exceeds four vehicles per day, which quickly leads to a potential conclusion that closing a bridge and detouring traffic should be focused only on very low volume roads and routes resulting in relatively short detours/alternate routes.

Figure 27. Cost Effectiveness Comparison of Structure Replacement Versus Detour



Access to Farmsteads

Closing a bridge that results in a rural farmstead and in some cases cultivated farmland being left without access should significantly influence the decision process as the level of hardship on one or more county residents is so pronounced. It is suggested that a first step in the process of determining which bridges could be potential candidates for closure as an alternate to rehabilitation/replacement is identification of those bridges that would landlock one or more farmsteads if it was to be closed. These bridges would then require a more sensitive level of review in the potential for closure screening process.

Characteristics of Bridge on Alternate Routes

As part of the evaluation/consideration process of determining whether to replace or close a bridge, specifics of bridges that would be used along an alternate route need to be documented. If the alternate route includes a low water crossing, additional consideration of not closing the primary evaluation structure should be provided. In this case, a similar review of the detour implications and landlocking potential of removing the low water crossing is recommended. If the low water crossing bridge has fewer negative impacts and replacing both bridges is not financially feasible, added consideration of closing the low water crossing should be incorporated into assessment of the primary crossing being evaluated.

Closing

From the information included in this section and collected as part of the research that went into the document, the following recommendations are provided:

- Narrowing the decision to strictly an economic assessment will rarely yield a situation where the conclusion would be to close a bridge. The detour/alternate route resulting from a closure will generally add two or more miles to the typical trip, which is a relatively short distance. The increase in operating costs for vehicles required to make the trip quickly offsets the capital cost of replacing a shorter, two-lane bridge. The detour operating costs relative to the annualized capital replacement cost does not address the cash flow differences between how the county can fund replacement of a bridge relative to the distributed, private sector incremental cost of added travel distance.
- Characteristics of a potential detour/alternate route are important to the long term and emergency situation viability of the decision to close a bridge. If the alternate route on which the cost analysis was based

includes a low water crossing, objections to the route and the logic of the selection process will be voiced during flood events.

- It is not possible to entirely remove the political process from the decision making. The goal of adding a set of performance-based evaluation criteria is to reduce the significance of the political process.

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