Clay County, South Dakota

CLAY COUNTY

MASTER TRANSPORTATION PLAN

Final Report ▪ February 2023

In Cooperation with

- CLAY COUNTY, SOUTH DAKOTA
- SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION
- FEDERAL HIGHWAY ADMINISTRATION

SD DEPARTMENT OF TRANSPORTATION

U.S. Department of Transportation
Federal Highway Administration

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EXECUTIVE SUMMARY

The Clay County Master Transportation Plan will serve as a guide for the County's future transportation network in a multi-modal perspective. Safety, infrastructure, and operations needs are examined and prioritized to enhance economic and social well-being of county residents. This study is Clay County's first long range transportation plan (20+ years) and sets the baseline for the County's vision and future decision-making. This study set out to meet three objectives:

1. Complete a list of transportation issues and needs facing Clay County.

2. Develop feasible solutions to address those issues and needs that meet current design standards and/or traffic level of service expectations under both the current and predicted future traffic conditions while promoting a livable community that will enhance the economic and social well-being of Clay County residents.

3. Create final products for use by Clay County and the South Dakota Department of Transportation which will provide guidance to implement recommended improvements and react to future development plans within the area.

A list of issues and needs were identified through baseline conditions analysis, discussions with the Study Advisory Team, and stakeholder and public feedback. This list forms the basis for the study recommendations, including new standards, guidelines, and future project implementation.

CLAY COUNTY'S PRIMARY ISSUES, NEEDS, AND CHALLENGES FOR HIGHWAY NETWORK

Bridge Replacement	Road Conditions
Road Geometry and Safety	Flooded Roads
Demand for Bicycle and Pedestrian Infrastructure	Urban Growth and Development
Jurisdictional Ownership	Prioritizing Improvements with Available Funding

Next, a series of standards and guidelines unique to Clay County were developed to guide the implementation of planned improvements:

- Major Roads Plan
- Base Typical Cross Section and Bridge Width Standards
- Level of Service Standards
- Access Management Access-Location Criteria
- Surface Type Change Policy Guidelines
- Jurisdictional Transfer
- Changing Maintenance Designation Guidelines

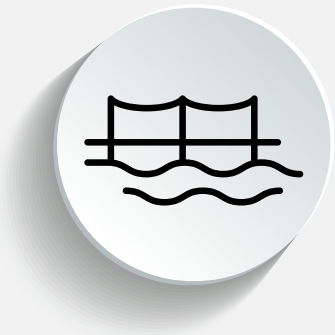
Specifically, standards and guidelines help address issues and needs when it comes time to design projects and plan funding and responsibility.

Future conditions analyses were conducted to better understand how the needs of Clay County will develop over time. The analyses forecast future traffic volumes so that future congestion issues not readily identified during the baseline conditions analysis may become apparent. Bridge condition analyses were also conducted to determine how many bridges may need to be replaced. Pervasive flooding issues were also analyzed with the help of focus group meetings to provide solutions such as proposed emergency routes, general flooding "staging" categories, and flood mitigation techniques, all of which will provide Clay County with more resilient transportation infrastructure and operations. Existing issues and needs will become more prominent as time passes and as a result, The future conditions analyses aim to identify future issues and deficiencies so that infrastructure in the County may act proactively for more sustainable improvements.

THE STANDARDS AND DOCUMENTS PROVIDED AS PART OF THIS STUDY WILL HELP GUIDE THE COUNTY WITH FUTURE DECISION-MAKING QUESTIONS, INCLUDING THE FOLLOWING:

- ☑ Which roads and bridges have the highest priority for funding?
- ☑ Which roads can be part of a future connected bike route?
- ☑ How wide does a bridge need to be on certain types of roads?
- ☑ Where should new driveways and intersections be allowed on a county highway?
- ☑ What is an acceptable level of traffic delay due to increased traffic demand?
- ☑ When should a gravel road be paved?
- ☑ When and how should the County plan to transfer jurisdiction with state, city, or township?
- ☑ Should the County consider changing a road to minimum maintenance designation?

The **Bicycle and Pedestrian Plan** provides Clay County with the opportunity to build a network of bike and pedestrian infrastructure that promotes active transportation, public health, tourism, sustainability, resiliency, and economic development. An accessible bicycle network is outlined in the plan through bikeways and trails that create an effective space or buffer from traffic and ties in with the typical road cross section design (with paved shoulders) of the Major Roads Plan. It also proposes an exciting comprehensive Trails Master Plan as a vision for active transportation in Clay County. This network planned in phases with 15 new conceptual routes would benefit Clay County for generations, attracting new recreational opportunities, tourism, and development throughout the county.



The **Bridge Replacement Plan** features a prioritization of bridges expected to potentially need replacement by 2045. With 75 county-owned bridges and rising costs to repair and replace, it is imperative that Clay County take advantage of its new eligibility for Bridge Improvement Grant (BIG) funding, with up to 80% of the bridge replacement costs covered. The Bridge Replacement Plan shows how its current bridges would score for funding applications. Additionally, best practices for bridge maintenance are provided to extend life of all bridges to help avoid huge bridge expenditures and closures.

The **Enhancement Project Implementation Plan** proposes a list of enhancement projects that specifically address existing and future issues and needs. First, these projects were screened for a purpose and need to ensure the proposed projects meet objectives that address the need(s). Next, these projects were prioritized according to importance, urgency, cost, benefits, and public feedback. As funding becomes available, Clay County can use this plan as a reliable guide when determining which projects to implement.

This study could not have been completed in good faith without valuable input from stakeholders, members of the public, and the Study Advisory Team. Survey results and direct comments submitted through a variety of resources including interactive mapping were carefully recorded and considered throughout the study process in order to authenticate the purposes, intentions, and conclusions of this study.

This study uses the year 2045 as the planning horizon. However, needs and priorities are expected to change over time, so this document is considered a "living document." It is recommended to maintain this document by performing an update to this study every 5-10 years to keep it current and beneficial to the County.

1. INTRODUCTION

Background

Clay County officials recognized a need for long term transportation planning due to the challenges in prioritizing the funding for transportation infrastructure. Transportation needs inevitably change over time. Disruptions to the transportation network emerge that were not a concern in the past. Modern research and innovation present new opportunities for improvement. This document focuses on the current and future transportation infrastructure issues that Clay County faces and how and when should issues be addressed knowing that funds may not be available for all improvements.

The South Dakota Department of Transportation (SDDOT) shares funding with local governments for planning and research. Clay County applied for and was thus awarded funding for a county Master Transportation Plan (MTP), to aid in prioritization of transportation needs and investments by considering factors such as traffic volume, crash history, truck routes, flooding trends, infrastructure service life, and multi-modal perspectives. Coordinating agencies included SDDOT and Clay County.

Public participation was a vital element in assembling this plan in addition to the input from stakeholders. The recommendations of this plan have a direct impact those who depend on the transportation network, whether that means sustaining connectivity, improving safety, or maintaining quality of life. The process of assembling this document is structured in a manner to gather and incorporate input and keep all community members informed as issues are identified and strategies are developed. Those that took the opportunity to be involved aided in the future of transportation infrastructure for their county. Their visions and guidance were documented and accounted for when prioritizing future needs for a 20-year planning horizon (2045).

With this document, there is support that transportation infrastructure needs are being met with proper planning to address those needs. It will come to serve as a guide for decision-making and a blueprint of Clay County's transportation infrastructure for years and decades to come. This plan is adaptable and should be periodically updated to consider emerging challenges and trends.

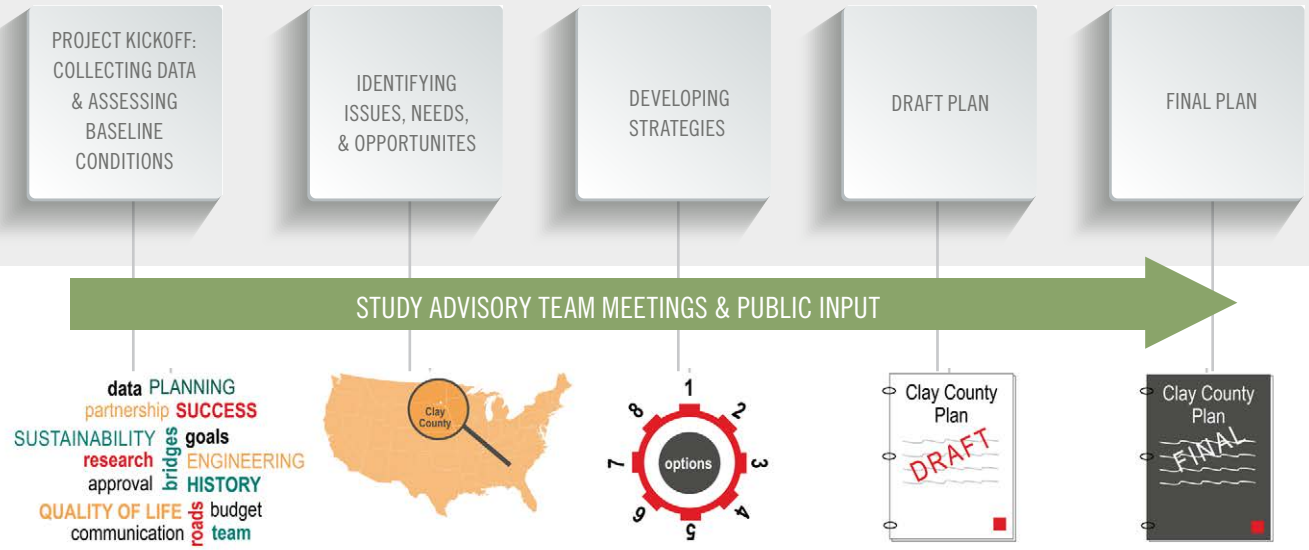


Figure 1. Study Process

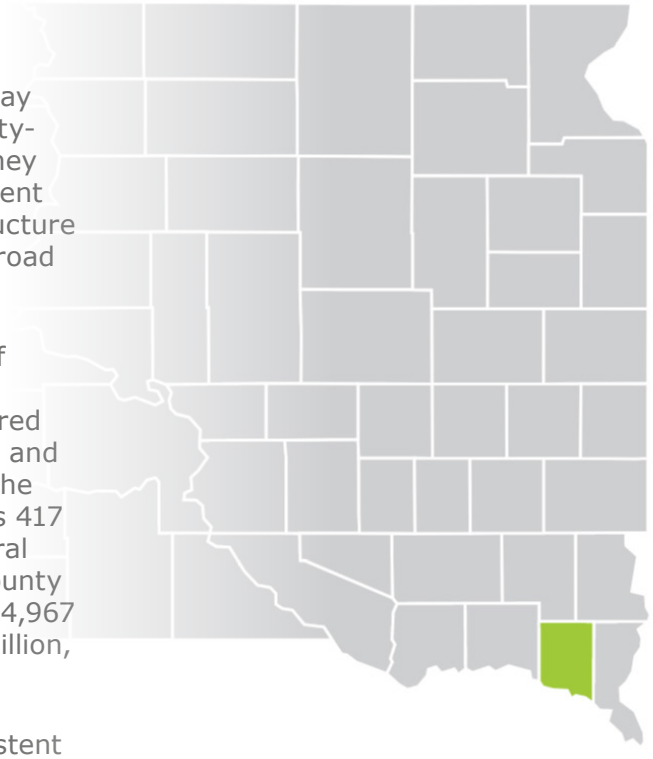
Study Advisory Team

The Study Advisory Team (SAT) consists of representatives from Clay County and SDDOT. The consultant team met with the SAT on six occasions throughout the study process. The role of the SAT was to guide the development of the MTP, review progress, provide comments on study materials, and apply insight throughout the study. The SAT was also responsible to ensure that the study objectives of this study Plan were met upon completion of the study.

Photo: Data collection site visit

Location

The study area is Clay County, SD, and all communities and surface transportation infrastructure there within. The focus of the Clay County Master Transportation Plan is the county-owned and maintained roads and bridges as they require the most significant financial commitment to maintain the county transportation infrastructure network. Figure 2 shows a map of the county road network.



Clay County is near the southeastern corner of South Dakota, home to the confluence of the Missouri River and Vermillion River. It is bordered by Yankton County to the west, Turner County and Lincoln County to the north, Union County to the east, and Nebraska to the south. The county is 417 square miles of fertile farmland and mostly rural population. Clay County is also the smallest county by area in South Dakota with a population of 14,967 as of 2020. This includes communities of Vermillion, Wakonda, and Irene (partial).[1]

Clay County's roadway system is mostly consistent with a one-square-mile grid pattern, served by state, county, city, and township owned roadways. Interstate 29 is a primary nearby thoroughfare running adjacent to Clay County's eastern border; it runs north to south in Union County. Clay County is also served by three state highways: SD 19, SD 46, and SD 50. The County is responsible for maintenance of approximately 241 miles of road (186 miles paved, 55 miles unpaved), and 75 bridges.

1 U.S. Census Bureau. 2020 Decennial Census

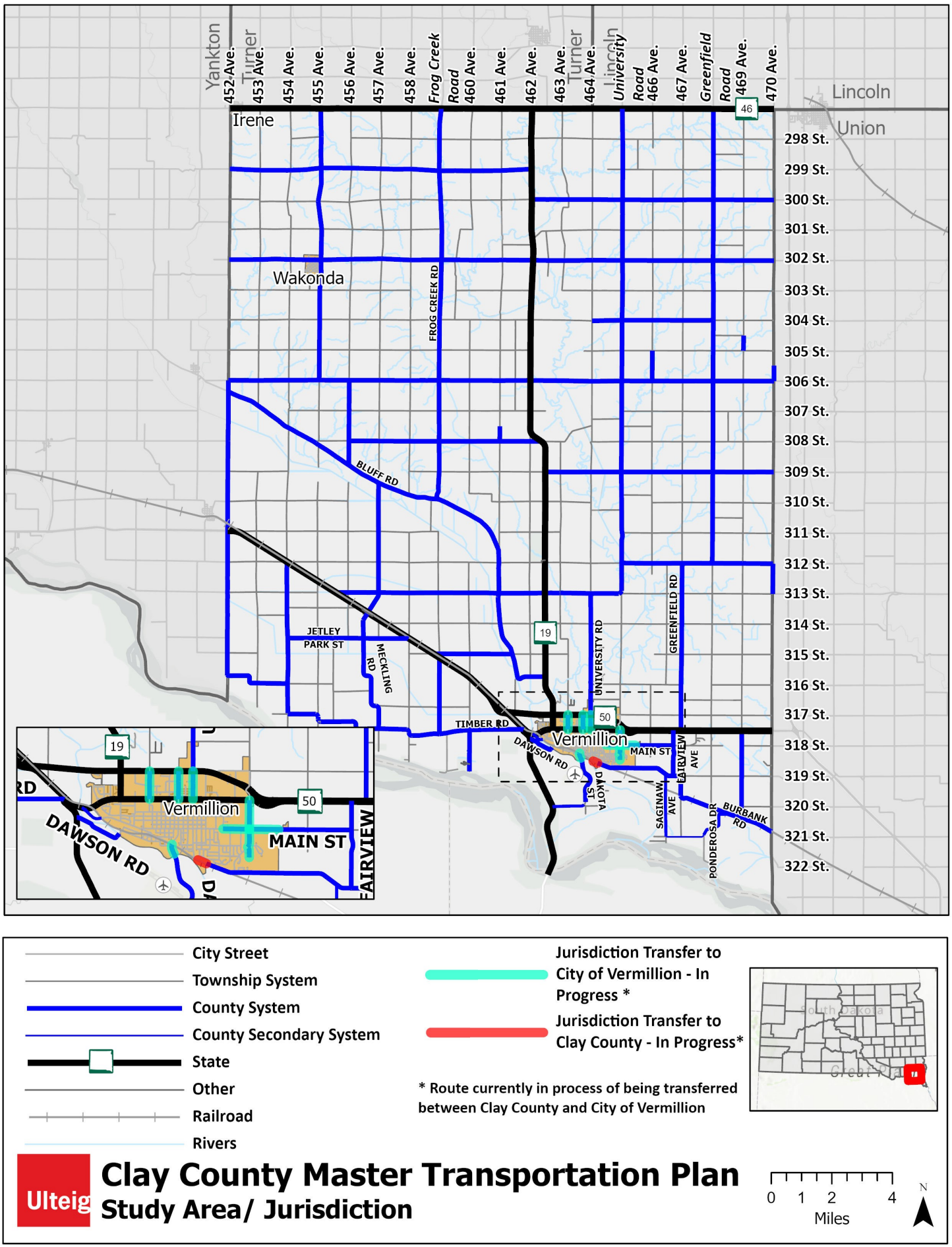


Figure 2: Study Area / Jurisdiction

2. BASELINE CONDITIONS

Demographics, Population, Economy, and Employment

DEMOGRAPHICS AND POPULATION

According to the American Community Survey[2] (ACS) estimates, the median age in Clay County is estimated to be 24.9 years old, which is 12.8 years younger than the median age in South Dakota of 37.7 years old, likely due to the presence of the University of South Dakota. The median household income in Clay County of $50,724 trended slightly lower than the $58,275 median household income for the State of South Dakota. Current ACS data states an estimated 22.4% of Clay County individuals live below the poverty level. See Table 1 for demographics and population data for Clay County.

Population characteristics and trends are essential to understand when planning transportation systems. High growth areas face increased demand for infrastructure enhancements. Areas of higher population density are most efficient when considering multi-modal transportation modes. Age and income demographics are indicators for preferred mode choice (walking, biking, driving, or transit). Examining population trends better informs decisions where future transportation investments should be best spent.

Based on available data from the U.S. Census Bureau and ACS, the population of Clay County is showing growth at a similar rate to the rest of the state of South Dakota. Table 2 shows how population has changed since 2000 within the cities of Clay County, SD.

Table 1. Demographics and Population of Clay County

Location	2000	2010	2020	Growth 2010-2020
Vermillion	9,728	10,571	11,695	10.6%
Irene	436	420	422	0.5%
Wakonda	360	321	347	8.1%
Clay County	13,740	13,864	14,967	8.0%
South Dakota	754,844	814,180	886,667	8.9%

Source: U.S. Census Bureau

Table 2. Decennial US Census Population of Clay County

Demographic	Clay County	South Dakota
Population	13,957	870,638
Median Age	24.9	37.7
Mean Travel Time to Work (minutes)	15.9	17.2
Median Household Income (2019 $)	$50,724	$58,275
Persons in Poverty	22.4%	11.9%
Land Area (sq. mi.)	417	75,811
Population Density (person/sq. mi.)	33.5	11.5

Source: U.S. Census Bureau

2 U.S. Census Bureau. 2015-2019 American Community Survey

VULNERABLE POPULATIONS

Clay County's vulnerable population is comprised of those with low incomes, minorities, youth, or those with limited physical abilities. Similar to many areas in the United States, Clay County is experiencing an increase in the number of older adults living in the community from 10.5% in 2015 to 17.1% in 2019. This increase in proportion of the population that is elderly will create changing demands on the transportation network and transportation services such as local transit and Senior Wheels programs. The percentage of population under 18 has held steady only fluctuating between 15.9% and 17.2%. The 18-64 age category reduced from 72.6% to 66.0% over the most recent 5-year period, a 6.6% drop.

MEANS OF TRANSPORTATION TO WORK

The U.S. Census data was obtained to determine the transportation modes that Clay County residents use to commute to work. The most common means of transportation to work is driving alone (one person per vehicle), which makes up 69.7% of trips to work. This is lower than the South Dakota state average of 81% and likely due to the increased population of students living in Vermillion, and the increasing population of people aged over 65. See Figure 4 for a breakdown of modes used in Clay County.

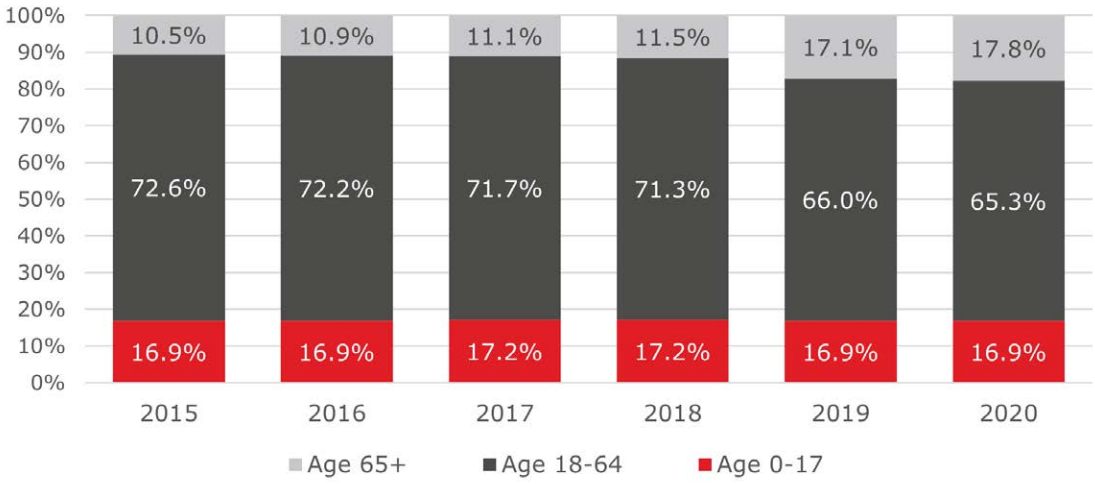


Figure 3. Clay County Population by Age Group

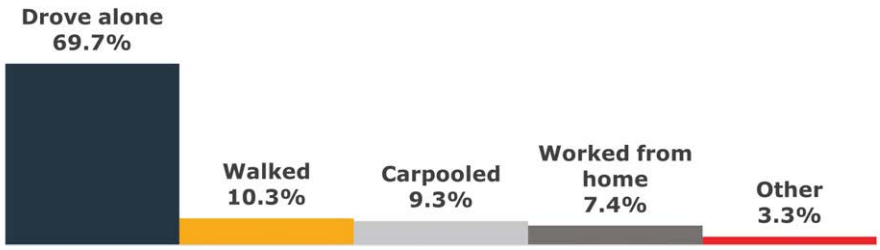


Figure 4. Clay County Mode Choice

ECONOMY

The 2019-2023 Comprehensive Economic Development Strategy (CEDS) was developed for the six counties forming the South Eastern Council of Governments (SECOG), which includes Clay County. Overall, CEDS identified steady population growth and low unemployment rate throughout the region. It also identified the strengths, weaknesses, opportunities, and threats to the region's development, and is designed to guide economic growth.

One of the focus areas was the importance of the infrastructure network. Some of the statements made in the CEDS report are shown below:

- The area is served by I-29 (outside of Clay County) as well as rail providers which allow for easy transport of goods and services.
- Quality infrastructure provides a foundation for economic development, but a declining population base in rural areas makes it harder to maintain existing public infrastructure that were established to serve a larger population.
- Develop priority-based, responsible, financially feasible long-term strategies for the financing and replacement of existing infrastructure.
- Develop multi-jurisdictional and regionalized infrastructure development strategies.
- Increase resiliency to disasters through land use and development regulations and address post-disaster redevelopment planning for various types of infrastructure and public facilities.

This study implements one of the goals of the CEDS report by developing a long-term strategy for Clay County's aging infrastructure. There will also be discussion on multi-jurisdictional cooperation and recommendations for increasing resiliency to disasters such as flooding.

EMPLOYMENT

It is estimated that there are approximately 5,329 jobs in Clay County, with higher numbers in Vermillion.[3] Using the North American Industry Classification System (NAICS), there is a diverse mix of employment types. Education, accommodation and food services, retail, health care and social assistance, public administration, and transportation and warehousing are the most prevalent job types in the area.

Table 3. Top 10 Job Counts in Clay County by NAICS Industry Sector

NAICS Industry Sector	Count	% Share
Educational Services	2,059	35.9%
Accommodation and Food Services	942	16.4%
Retail Trade	592	10.3%
Health Care and Social Assistance	536	9.3%
Public Administration	332	5.8%
Transportation and Warehousing	249	4.3%
Manufacturing	201	3.5%
Construction	175	3.1%
Administration & Support, Waste Mgmnt and Remediation	135	2.4%
Finance and Insurance	108	1.9%

Source: U.S. Census Bureau

3 U.S. Census Bureau. *Longitudinal Employer-Household Dynamics (2018)*

Jurisdiction

The Clay County region's main transportation routes include state highways, bituminous roads, concrete roads, and gravel roads. Roads within Clay County are governed according to their jurisdiction type. The jurisdiction of a road refers to the authority responsible for road maintenance and it impacts the organization functions and obligations including financial, regulatory, maintenance and construction commitments. See Figure 2 in the previous section for the Clay County Jurisdiction Map.

State highway system roads include SD Highway 19, SD Highway 46, and SD Highway 50. Under state law, the SDDOT is responsible for maintaining the segments of the state highway system that pass through counties.

Clay County is responsible for approximately 241 miles of the 862 miles of roadways in the county. This includes all Primary and Secondary County Highways. This responsibility contains 186 miles of paved roads and 55 miles of unpaved roads. There are also 75 bridges connecting county and township roads that Clay County is also responsible for, and these are often along township roads.

Other administration roads vary in definition, but are non-county maintained roads that typically include roads within Clay County Park, Main Street in Town/Community of Meckling, and a housing development north of Vermillion.

CLAY COUNTY JURISDICTIONAL CLASSIFICATION TYPES

- State Highway System
- County System
- County Secondary System
- Township System
- City Street
- Other Administration

Functional Classification

Clay County has jurisdiction over 241 miles, or 27.9% of total road miles, including 3.6 miles of arterial roadway and 237.4 miles of collector or local roads.

The Clay County roadway classification system is based on the Highway Functional Classification system from the FHWA. Coordinating functional classification for all roads in South Dakota is the responsibility of SDDOT Project Development and is shown in Figure 5.

The FHWA's Functional Classification System[4] ranges from high-speed interstate commerce to local land access, each serving a particular function. Functional classification is also used to determine federal funding eligibility. All public roads functionally classified at least as major collector for rural roads and at least minor collector for urban roads (or higher classifications) are eligible for federal assistance provided by the Intermodal Surface Transportation Efficiency Act (ISTEA), continued through the Fixing America's Surface Transportation Act (FAST Act), and now through the Infrastructure Investment and Jobs Act (IIJA). These roads are referred to as "Federal-aid Highways."

INTERSTATES

Interstates are the highest classification of arterials. They are designed for mobility and long distance travel. The Interstate System was initiated in the 1950s, and has provided a superior network of limited access, divided highways that offer high levels of mobility while linking major urban areas of the U.S. There are no interstates in Clay County.

Table 4. Functional Classification

Functional Classification	Total Mileage	County Responsibility (miles)
Principal Arterial - Interstate	0.0	0.0
Principal Arterial - Expressways	36.4	0.0
Principal Arterial - Other	6.7	0.0
Minor Arterial	53.6	3.6
Major Collector	131.8	123.5
Minor Collector	58.8	58.8
Local	575.0	54.9
Total	862.3	240.8

OTHER FREEWAYS AND EXPRESSWAYS

Roadways in this category look similar to interstates, with divided driving lanes that are typically separated by a physical barrier. Their access and egress points are limited to on- and off-ramp locations or a very limited number of at-grade intersections. SD 50 is the only road in Clay County with this classification.

OTHER PRINCIPAL ARTERIALS

All other Principal Arterials serve major centers of metropolitan areas. They provide high degree of mobility and can also provide mobility through rural areas, though abutting land uses can be served directly, including driveways to specific parcels and at-grade intersections with other roadways. In the rural setting, they have trip length and travel density characteristics indicative of substantial statewide or interstate travel. SD 19 from SD 50 to the Missouri River is the only road in Clay County with this classification.

4 Federal Highway Administration. *Highway Functional Classification Concepts, Criteria and Procedures, 2013 Edition*. https://dot.sd.gov/media/documents/HwyFunctionalClassification.pdf

MINOR ARTERIALS

Minor Arterials provide service for trips of moderate length. In urban settings, they interconnect and augment the higher arterial system and may carry local bus routes. Minor Arterials are spaced about one mile in fully developed areas and about 2 to 3 miles in suburban fringe areas. In rural settings, they are spaced at intervals consistent with population density and have high overall travel speeds.

MAJOR AND MINOR COLLECTORS

Collectors serve a critical role in the roadway network by gathering traffic from Local Roads and funneling them to the arterial network, broken down into two divisions: Rural and Urban, as well as two sub-categories: Major Collectors and Minor Collectors. The determination of whether a given collector is major or minor is frequently one of the biggest challenges in functionally classifying a roadway network, with considerations for destinations, travel distance, travel speeds, traffic volumes, and spacing of other classifications. The determination of this classification can influence design of the road itself as well as adjacent land use and access. The majority of Clay County roads fall under either the Rural Major Collector or Rural Minor Collector classification.

Major Collectors in the rural setting, which is most applicable to the Clay County road network, provide service to any county seat not on an arterial route, to the larger towns not directly served by the higher systems, and to other traffic generators of equivalent intra-county importance (for example consolidated schools, shipping points, county parks, important agricultural destinations, etc.). Major Collectors link these places with larger towns or with Arterial routes and serve the most important intra-county travel corridors.

Minor Collectors in the rural setting are spaced at intervals consistent with population density, collect traffic from Local Roads and bring all developed areas within reasonable distance of a Collector. Minor Collectors provide service to smaller communities not served by a higher-class facility and link locally important traffic generators with their deep rural origins.

LOCAL ROADS

Local Roads are the most common of all roadway classifications in terms of mileage. They are not intended for use in long distance travel, except at the origin or destination end of the trip. They provide direct access to abutting land and are often designed to discourage through traffic. These public roads should be accessible for public use throughout the year. Often, roads that are not assigned a functional classification are considered Local Roads by default. In the urban setting, Local Roads provide direct access to adjacent land, provide access to higher-class facilities, and carry no through traffic movement. In the rural setting, Local Roads primarily provide access to adjacent land and provide service to travel over short distances as compared to other higher systems.

Roadway Surface Type

Clay County roads consist of concrete, asphalt/bituminous, gravel, and unsurfaced roads. Roadway surface types that are owned and maintained by Clay County are found in Table 5 and Figure 6.

Table 5. Roadway Surface Type

Surface Type	Miles	%
Gravel	55.1	22.9%
Bituminous	182.3	75.7%
Concrete	3.4	1.4%

Source: SDDOT Geodatabase

Photo: Bituminous Surfacing in Clay County

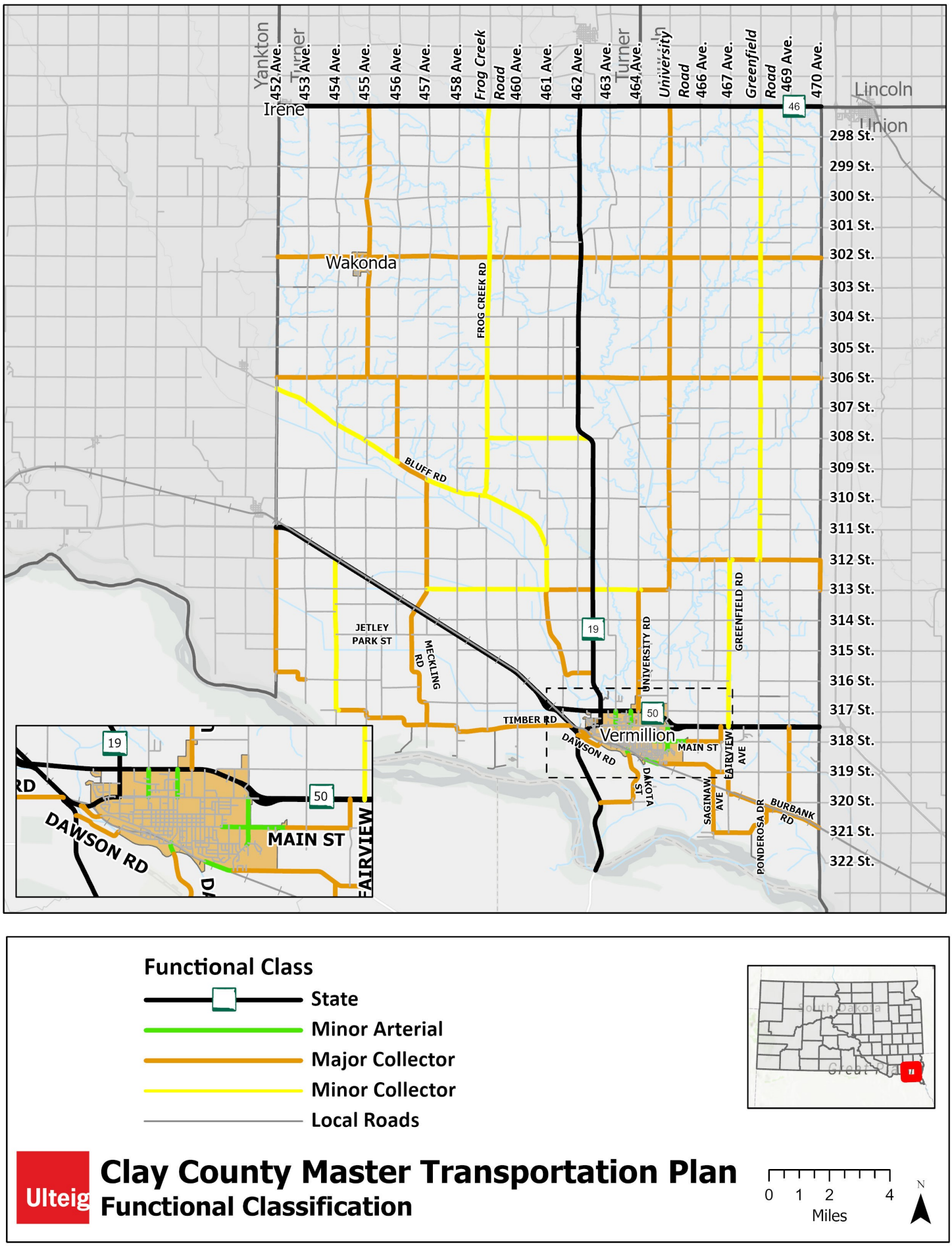
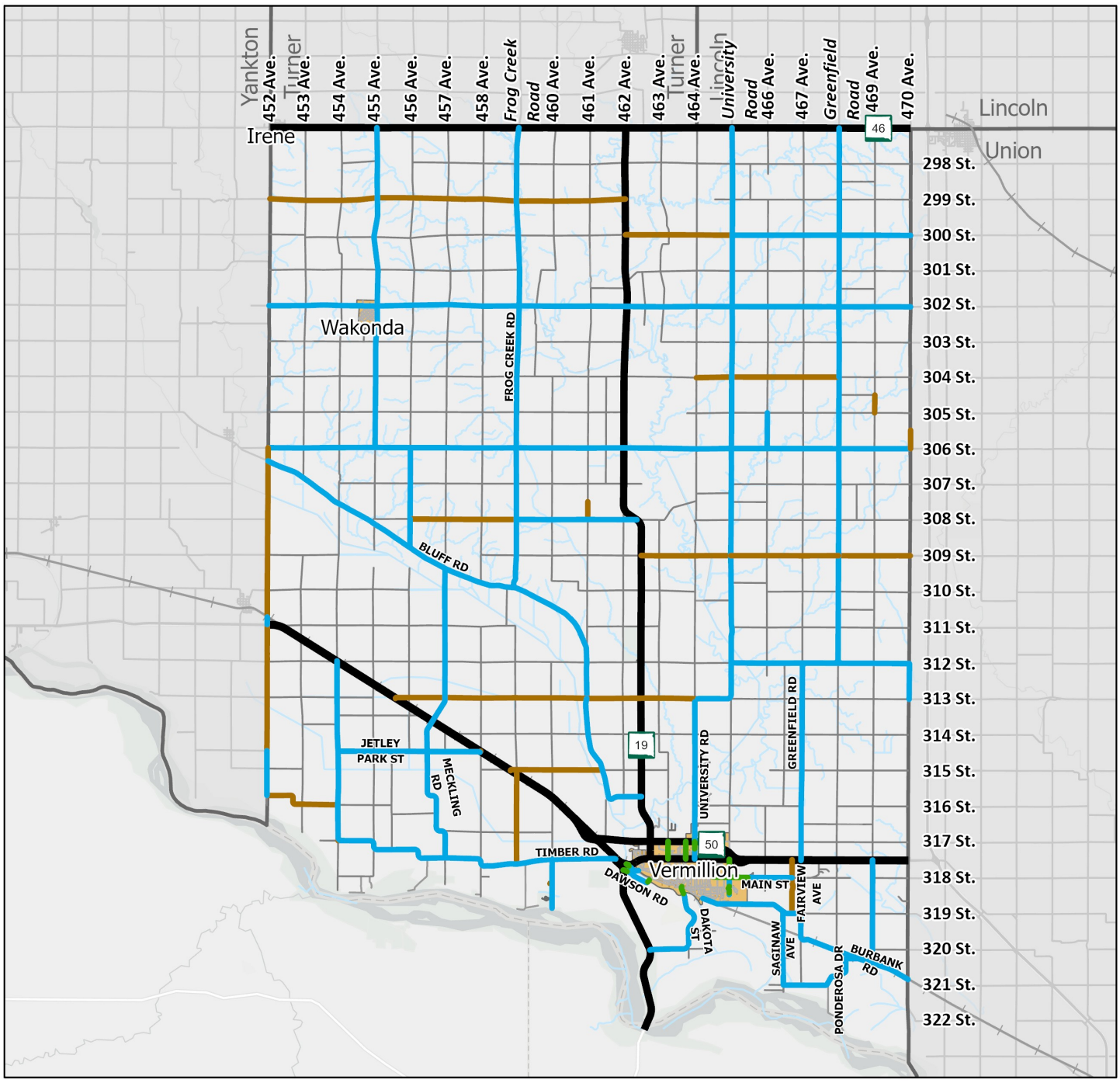


Figure 5: Functional Classification



Surface Type

- State
- County Concrete
- County Bituminous
- County Gravel
- Local Roads

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Clay County Master Transportation Plan

Roadway Surface Type

0 1 2 4
Miles

N

Figure 6: Roadway Surface Type

Traffic Volumes and Level of Service

Clay County traffic volumes outside its urban areas were mostly observed to be low. Vehicles predominantly use state roadways to travel the region, and county primary, secondary, and township roads to circulate within local areas.

The majority of Clay County-maintained roads are rural in nature, with low or very low daily volumes. The most recent traffic counts for these roads are usually less than 400 vehicles per day, with negligible congestion. Some of the roads within Clay County jurisdiction are within the City of Vermillion (including urban cross sections) or in the immediate surrounding area. These roads have higher volumes due to their urban or suburban surroundings, often 1,000 to 5,000 vehicles per day. Congestion may occur on some of these roads during peak traffic hours. For this study, the majority of existing traffic counts were collected in 2018. All counts collected before the year 2022 were extrapolated to the year 2022 using the SDDOT's annual growth rate for Clay County, 3.0%.

The SDDOT Road Design Manual[5] was consulted in determination of two-lane planning level capacity. The corresponding volume to capacity (V/C) ratios along Clay County-owned roadways were developed using the guidance in the Design Manual (Table 6), which is to be used as general guidance for total number of lanes. Roads associated as "Urban" are functionally classified as urban. All other roads outside of the Vermillion area are "Rural Level."

Table 6. SDDOT Planning Level Capacity

Total Number of Lanes	Total Design year ADT[1]	
	Rural Level	Urban
2	< 8,000	< 2,500
3	[2]	2,500 to 16,000
4	8,000 to 20,000[3]	[3]
5	[2]	16,000 to 30,000
6	> 20,000[4]	> 30,000[4]

Source: SDDOT Road Design Manual, Chapter 15 Traffic Table 15-9

[1] Construction/Reconstruction projects are designed based on a typical 20-year ADT projection beyond the anticipated year of project construction.

[2]Continuous left turn lanes may be considered based on left turn volumes and/or when intersections and/or approaches are closely spaced together.

[3]Undivided sections may be used if left turn movements are low and there is no crash history, otherwise consider installing a median or 5-lane section.

[4]Medians should be used.

Existing traffic volumes in Clay County are well below the two-lane planning level capacity for the vast majority of roads. Due to urban and suburban nature of Clay County roads within Vermillion and the surrounding areas, some of these roads are showing signs of delays during peak traffic hours. However, almost all of these roads have existing cross sections that can be easily widened to three lanes, if necessary, to accommodate much larger traffic capacities.

Figure 7 shows existing daily traffic volumes and planning level V/C ratios along Clay County-owned road. A ratio of 1.0 indicates that the facility is at a planning-level capacity. However, each individual road has unique design elements that may mean that the road capacity is higher in reality. For example, if the road is wide enough, queued vehicles may be able to bypass turning vehicles instead of waiting behind them, as seen with most roads in the Vermillion area.

5 SDDOT *Road Design Manual*, Chapter 15 Traffic. https://dotfiles.sd.gov/rd/rdmch15.pdf (accessed July 2022)

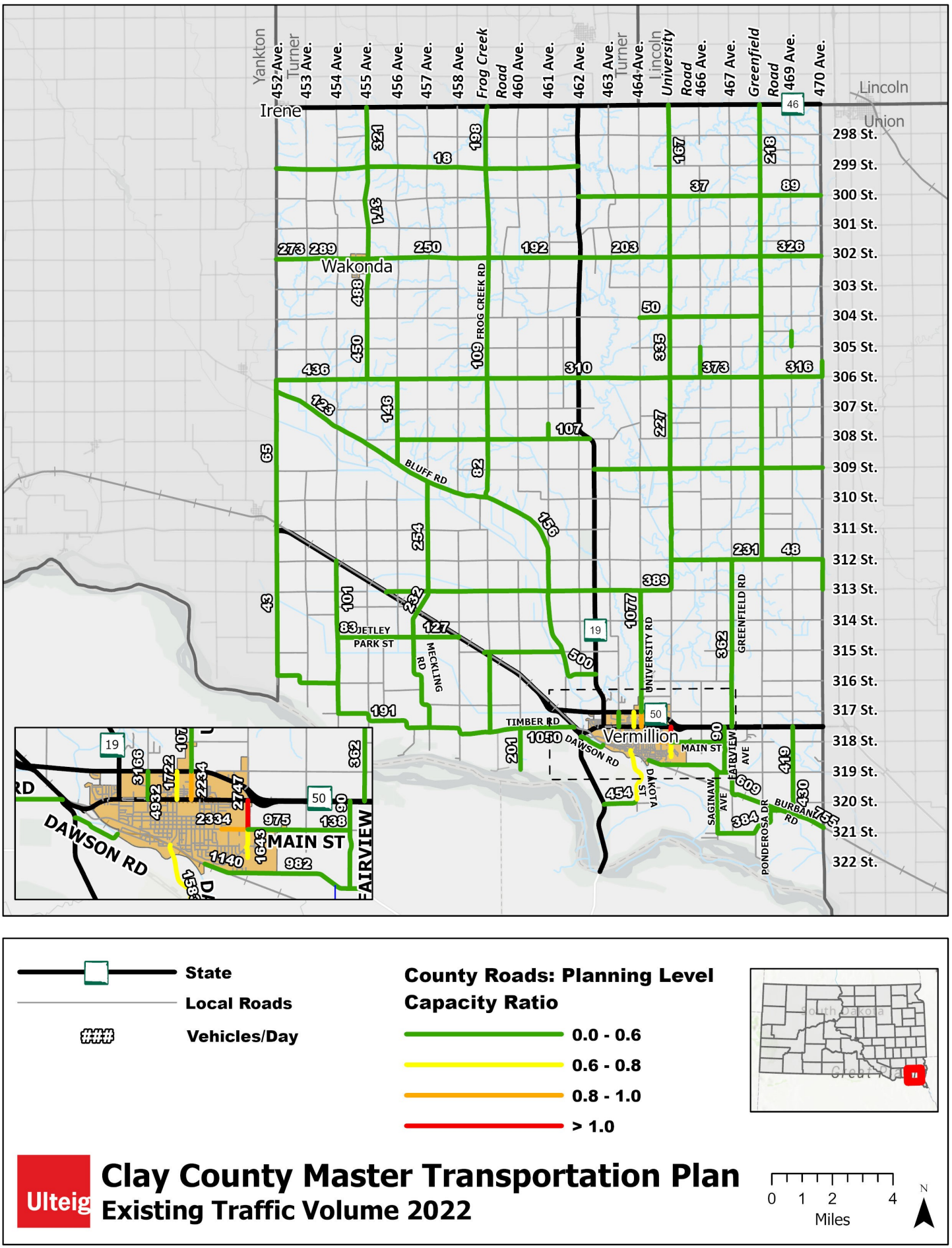


Figure 7: Existing Traffic Volume 2022

Crash Analysis

Transportation-related fatalities and injuries pose a serious public health risk. Safety is a fundamental element in transportation improvements and special attention will be given to roads identified with safety concerns throughout the study area. To understand transportation safety issues in Clay County, existing crash data from 2016 to 2020[6] was evaluated to identify crash trends (Figure 8). Acknowledging safety problems and their magnitude is the first step of implementing traffic injury prevention strategies that can reduce traffic-related injuries and deaths. The assessment evaluated common crash locations, types, severity, modes, and traffic conditions in order to further identify clear crash trends, patterns and systemic safety issues. Ultimately, the purpose is to address safety issues through crash prevention strategies. All crashes during the 5-year period are shown on the map in Figure 9.

CRASH TRENDS

Crash trends over time for all drivers are examined and key findings are summarized below:

- The overall trend of the total number of crashes is currently fluctuating just below 200 crashes each year.
- Fatal and serious injury crashes are also relatively plateaued
- There were 5 fatal and 164 injury crashes in the last 5 years.
- Crashes involving wild animals are frequent especially on higher volume roadways (Table 7).

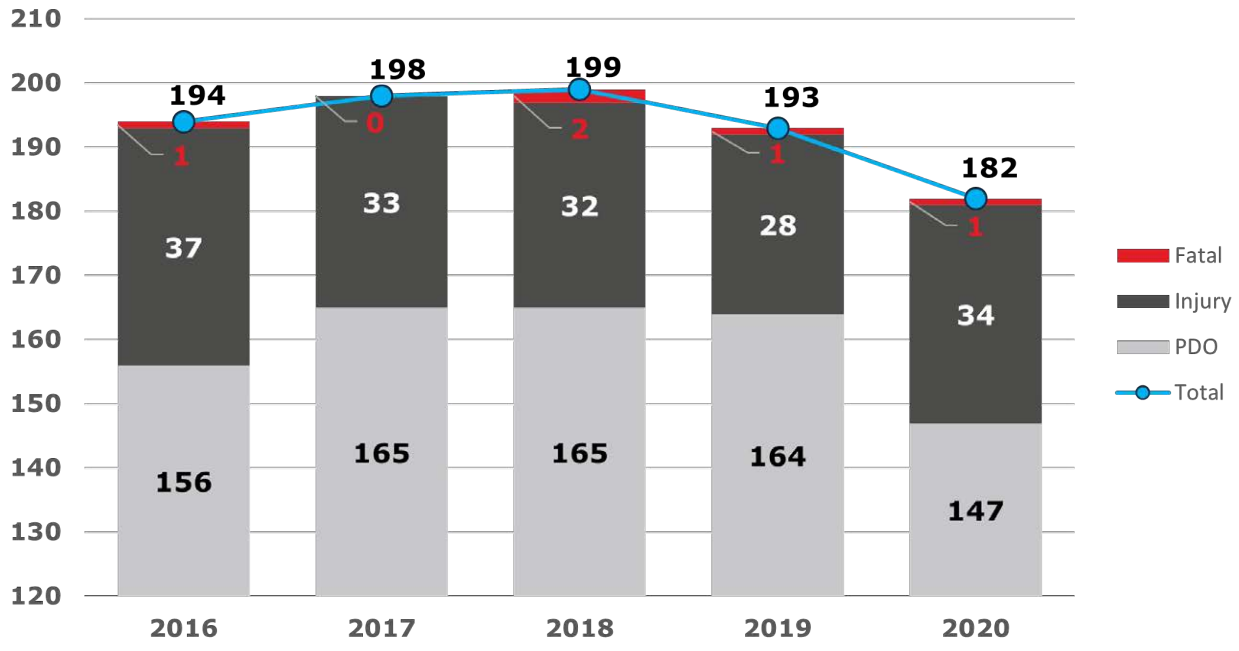


Figure 8. Crash Trends (2016-2020)

6 SDDOT Crash Database

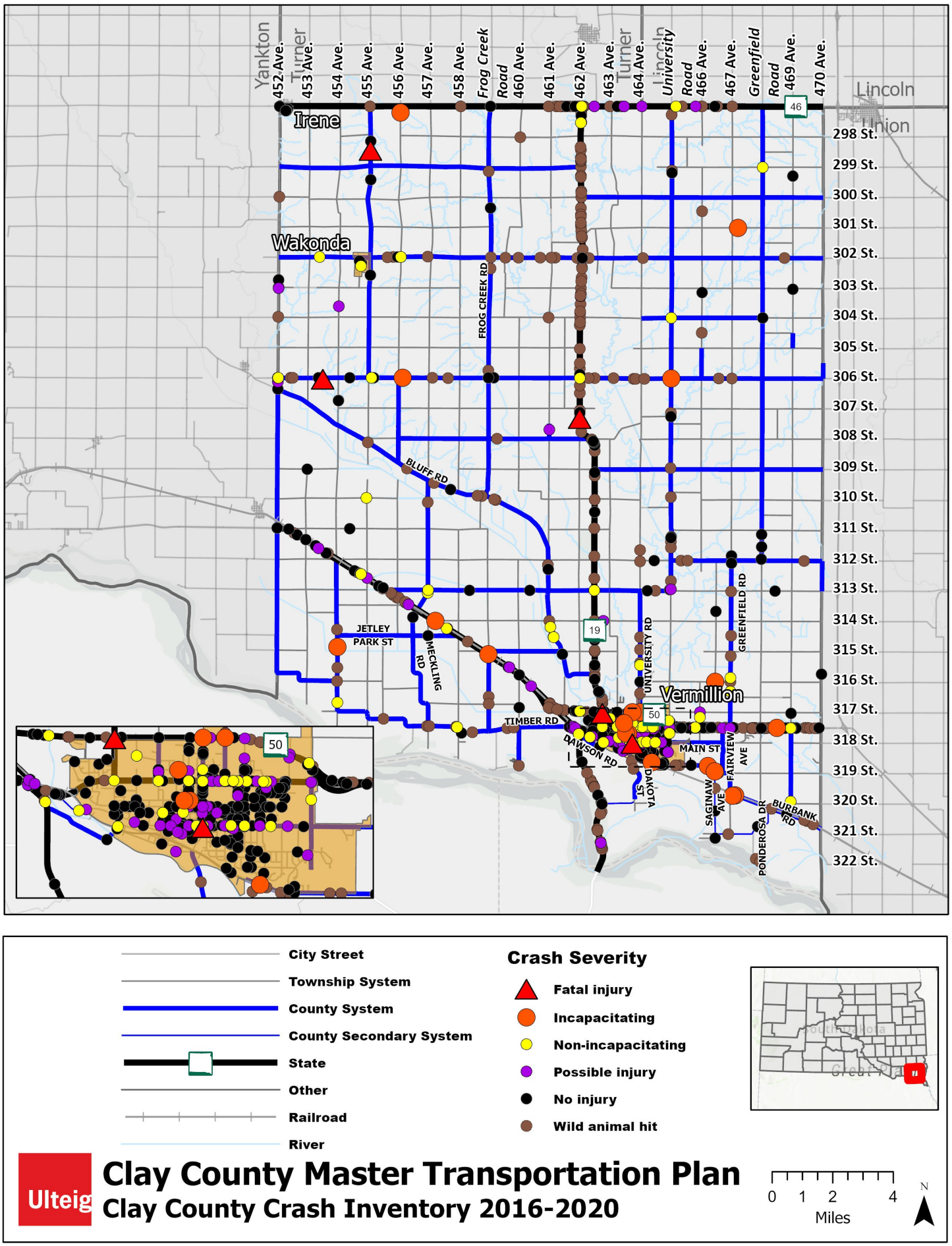


Figure 9: Clay County Crash Inventory 2016-2020

Table 7. Clay County Crash Types (2016-2020)

Manner of Collision	Total Crashes	Serious Injury	Fatal Injury	Fatal/Serious Crash Rate
Wild Animal	325	1	0	0.3%
Angle	208	8	1	4.3%
1 Motor Veh - Ran off rd.	154	11	4	9.7%
Rear-End	99	0	0	0.0%
Parked Motor Vehicle	84	0	0	0.0%
1 Motor Veh - Other	50	1	0	2.0%
Sideswipe Same Dir.	27	0	0	0.0%
Sideswipe Opp. Dir.	9	0	0	0.0%
1 Motor Veh - Pedestrian	8	1	0	12.5%
Head-On	1	0	0	0.0%
Rear-To-Rear	1	0	0	0.0%
Total	966	22	5	2.8%

Wild animal crashes are the most common type of crash, representing 34% of all reported crashes.

High severity crashes are crashes that result in serious (incapacitating) or fatal injuries to one or more people involved. From 2016 to 2020, there were 27 high severity crashes out of a total of 966 reported crashes in Clay County (2.8%).

47%

of total crashes (453) and 56% of high severity crashes (15) occurred after dark.

While crashes involving pedestrians and bicyclists are 1.5% of all crashes, pedestrian crashes made up 11% of high severity crashes, a relatively larger proportion of high severity crashes.

6%

of all crashes (57) were from alcohol-impaired driving crashes, but almost 26% of high severity crashes involved alcohol.

Speeding was involved with 8% of total crashes (76) and 11% of high severity crashes.

68%

of crashes (653) occurred during clear weather conditions contributing to 71% of high severity crashes.

Likewise, motorcycles made up 2% of all crashes but over 15% of high severity crashes.

CRASH CLUSTERS

Crash clusters were identified as part of the crash analysis. The methodology for identifying crash clusters was primarily screened using GIS mapping tools and crash descriptions. Locations along state highways or within the City of Vermillion were excluded. Due to the low traffic volumes on almost all county roads, crash rate methodology proved substantially overweighted towards any crash, so it was not utilized (for example if one crash occurred on a road with daily traffic volume of 100 vehicles per day, the crash rate proved to be extremely high compared to expected results). Therefore, crash analysis focused on high severity crashes (fatal and injury) or crash trends in general. This screening for crash clusters found crash trend at one location in particular.

BURBANK RD & 467 AVE

Burbank Rd, in the vicinity of 467 Ave and 0.25 miles east of 467 Ave, was identified as a road segment with crash history and safety concerns. This segment is functionally classified as a rural major collector, approximately 0.25 miles long, with 609 vehicles per day.

This road segment has a reverse horizontal curve and is signed with a 35 mph advisory speed. There is also a highway-rail crossing with flashing-light signals that are activated by approaching trains, and the presence of the crossing is the primary reason for the reverse curve. Based on crash location and type, it appears that the crashes are due to drivers who do not navigate the reverse curve safely. There were eight crashes reported, including two severe crashes. There were seven run-off-road type crashes. Therefore, this location should be a safety improvement priority. Signs for curves are already in place and there are some rumble strips, so additional safety countermeasures should be considered.

Short-term improvements could include centerline and edge line rumble strips where not already in place. High Friction Safety Treatment (HFST) may be an alternative if existing pavement friction is inadequate for prevailing site conditions (specifically friction demand), and there are other factors to consider if HFST is a suitable candidate treatment. Long-term improvements could include wider shoulders and lighting which would be safety countermeasures for run-off-road crashes. The safety benefits of wider shoulders on rural highways are highlighted in the Major Roads Plan (Section 5 of this report).

Improvement Alternatives

- Wider shoulders
- Slope flattening
- Rumble Strips
- Lighting
- High friction safety treatment (HFST)

Bridge Condition

Clay County maintains 75 bridge structures. Of those, 10 bridges are currently closed. The remaining 65 bridges are mostly less than 60 years old (89%).[7]

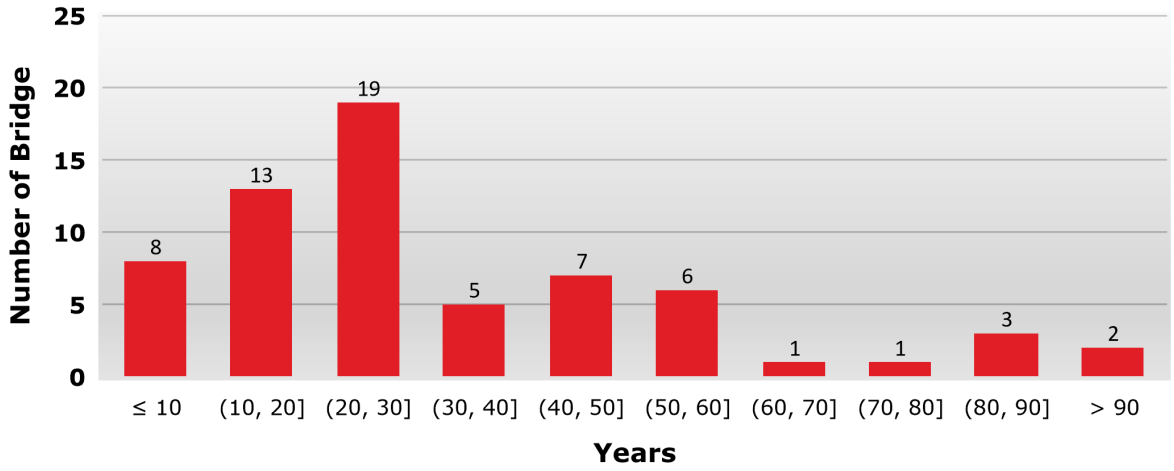


Figure 10. Bridge Age

Bridge inspections are conducted every two years in Clay County, and bridges are assigned one of three categories: Good, Fair, or Poor. Most of Clay County bridges are in Fair or Good condition (80%), but 15 of Clay County bridges are currently in Poor condition (7%) or closed (13%) (Figure 12). Bridges in Poor condition are structurally deficient, and these bridges have short or unknown remaining service lives, likely requiring high-cost repairs or replacement. Comparatively, in all of South Dakota, 25% of all county-owned bridges are in Poor Condition. Due to recent bridge closures and replacements, Clay County ranks below the state average for county-owned bridges in Poor condition.

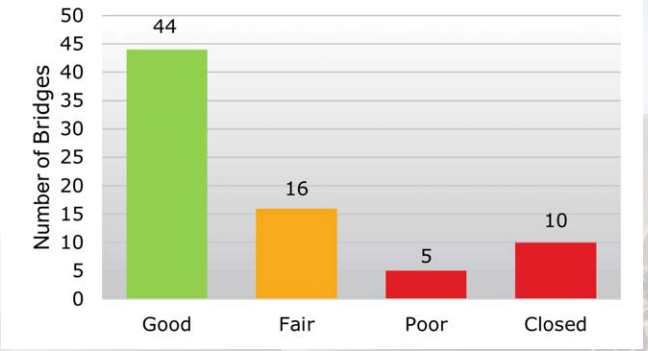


Figure 11. Existing Bridge Condition 2021

The current state of repair of bridges in Clay County is relatively good, so a focused effort on bridge maintenance will be key for to keep bridges in a state of good repair. For bridges that are deteriorating beyond repair, Clay County should initiate eligible applications for SDDOT Bridge Improvement Grants (BIG), which would help stem the need to permanently close bridges in the future.

7 Federal Highway Administration. National Bride Inventory (NBI), 2021 Data

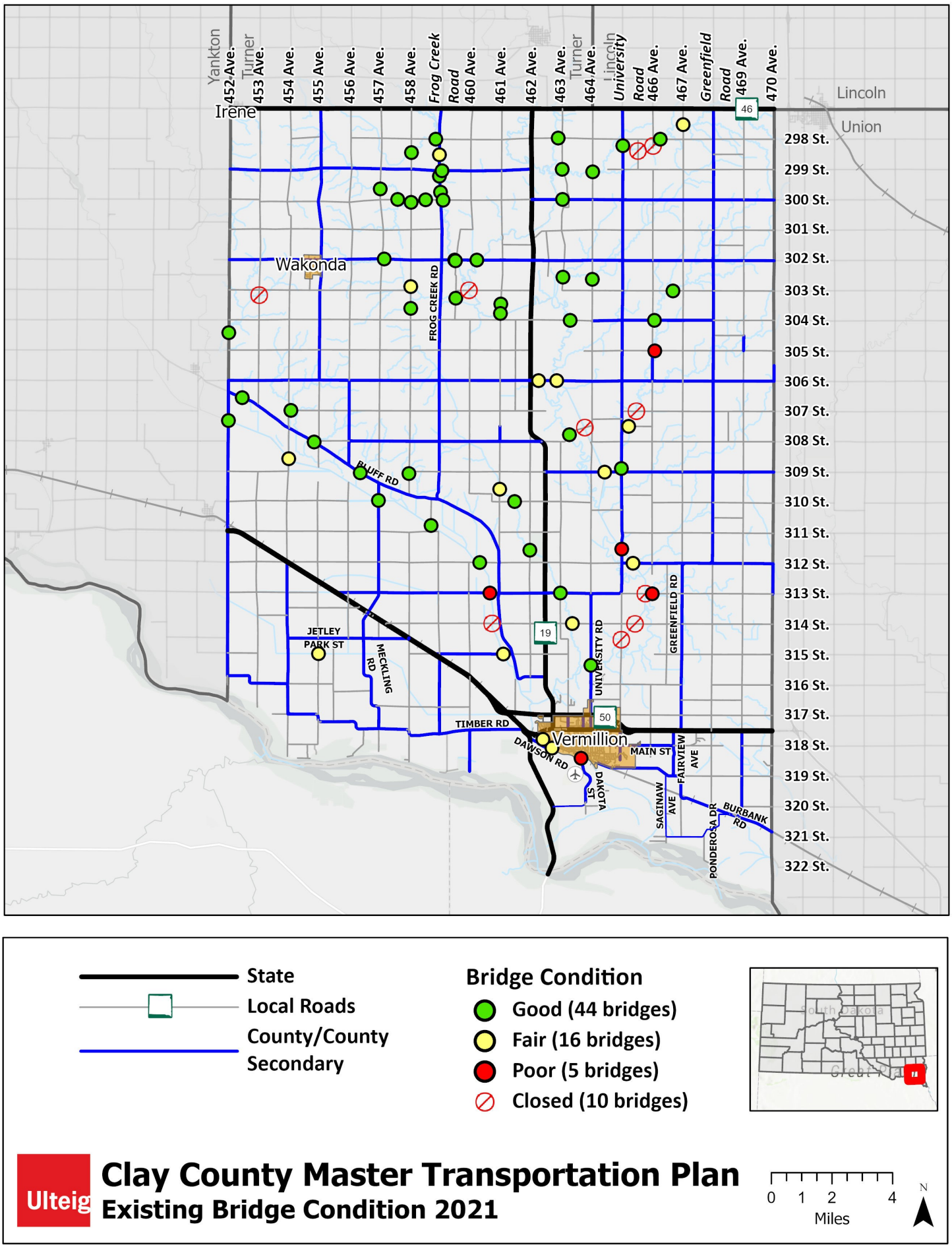


Figure 12: Existing Bridge Condition 2021

Flood Conditions

Seasonal flooding is a critical issue in Clay County creating undesirable effects such as closure of roadways, bridges, and intersections, and damage to the transportation and drainage network. When floodwaters subside, roadways within the path of flood waters are washed out and must be completely reconstructed. Entire portions of Clay County can be cut off by flooded roads, and seasonal flooding also creates inaccessibility for emergency responders, transit providers, school buses, and county roadway repair crews. This plan makes recommendations for seasonal flooding mitigation techniques in Section 5.

Table 8 shows Flooding Disaster Declarations for Clay County and nearby counties in South Dakota between 2007-2018.[8] Clay County made the declaration six times during this period.

Table 8. Federal Disaster Declarations (2007-2018)

Date	Event	County
5/22/2007	Severe Storms, Tornadoes, and Flooding	McCook
7/9/2008	Severe Storms and Flooding	Clay, McCook, Turner
3/9/2010	Severe Winter Storm and Snowstorm	Clay, Turner
3/10/2010	Severe Winter Storm	McCook, Turner
5/13/2010	Flooding	Clay, McCook, Turner, Union
9/23/2010	Severe Storms and Flooding	Clay, Lincoln, Minnehaha, Turner, Union
11/2/2010	Severe Storms and Flooding	Union
5/13/2011	Flooding	Clay, Union
5/10/2013	Severe Winter Storm and Snowstorm	Lincoln, McCook, Minnehaha, Turner
6/28/2013	Severe Storms, Tornado, and Flooding	Lincoln, Union
7/28/2014	Severe Storms, Tornadoes, and Flooding	Clay, Lincoln, Minnehaha, Turner, Union
7/30/2015	Severe Storms, Tornadoes, Straight-line Winds, and Flooding	McCook

Source: Federal Emergency Management Agency

Photos: The flood disaster of 2019 in Clay County is shown at various locations

8 South Eastern Council of Governments. 2019-2023 *Comprehensive Economic Development Strategy.*

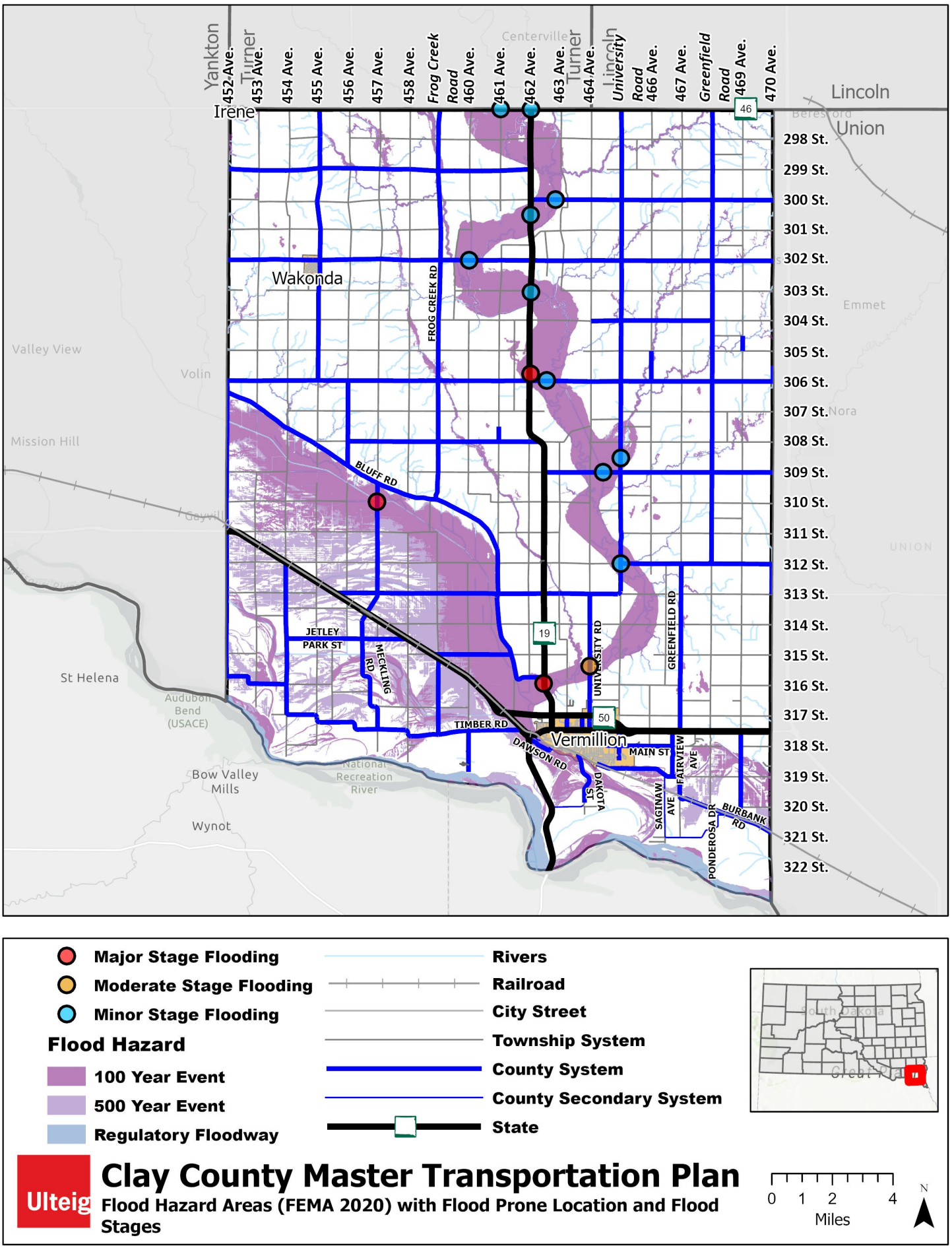


Figure 13: Flood Hazard Areas (FEMA 2020) with Flood Prone Locations and Flood Stages

Special Locations Analysis

As part of the study, special road segments and/or spot locations (Figure 14) were identified in early discussions with the Clay County Highway Department as having issues that required specific analysis. Improvement alternatives are also provided for each location. Proposed improvements are shown in Section 6.

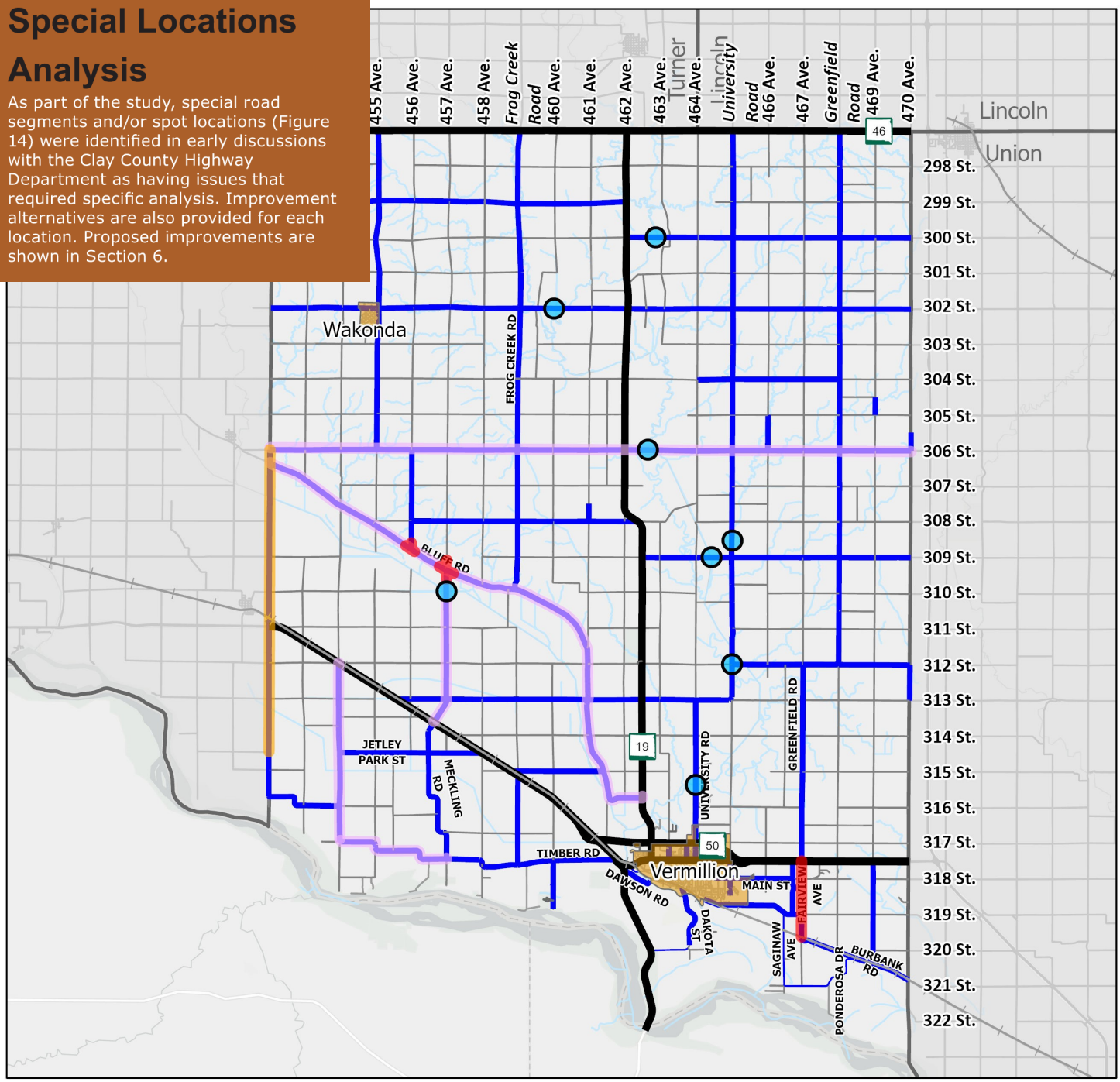


Figure 14: Special Locations with Known Issues

452 Avenue Corridor (306 St to Union School Road)

The 452 Ave corridor was identified as a gravel corridor with high truck traffic and potential to be paved or an "oiled road" (i.e., blotter road). The corridor runs along the western border of Clay County with Yankton County. It is 8.5 miles from 306 St to Union School Road (north of 315 St). SD 50 bisects the corridor at approximately 311 St. This corridor is functionally classified as a local road north of SD 50 and a major collector south of SD 50. The City of Gayville (population 374) is approximately 1 mile west of the corridor between SD 50 and 310 St, and there is an agricultural supply business adjacent to the road near Gayville.

Photos: 452 Ave between 306 & 307 St, looking north (top), looking south (bottom)

During the 5-year crash reporting period, there were three crashes. Two of the crashes were non-injury intersection related, and one was a run-off-the-road rollover with possible injury.

In general, the roadway surface appears to be approximately 24 to 26 feet wide. There is at least one unmarked box culvert structure that appears to be narrower than the roadway surface at 26'-3".

Analysis: Past traffic counts show a daily traffic volume of 104 vehicles per day north of SD 50 and 38 vehicles per day south of SD 50. Additionally, daily traffic volume was collected on May 3, 2022, north of SD 50, and it was 65 vehicles per day with approximately 24% heavy truck traffic. Based on these sample counts, it seems likely that past observations of high truck traffic may be more seasonal than annual. Ultimately, the decision to convert this gravel road to a blotter road or a paved road must take into consideration a number of factors. Among these, traffic volume is one of the ten initial considerations,[9] but traffic samples of existing traffic volumes are currently on the small end of the range of when to consider paving a road (50-500 vehicles per day). If the current County maintenance costs are excessive, then a more durable surface should be considered and could include treatments to the gravel surface itself rather than converting the road to a blotter road or a paved road.

Photos: 452 Ave near 311 St and railroad crossing (top), near narrow structure north of 308 St (bottom)

Improvement Alternatives:

- Do nothing
- Treatment of gravel surface for improved durability
- Convert to surface treated road (blotter road)
- Convert to asphalt road by reconstruction

9 FHWA and South Dakota Local Technical Assistance Program (SDLTAP). Gravel Roads Construction & Maintenance Guide (August 2015). Appendix D: When to Pave a Gravel Road

454 Avenue Corridor (SD 50 to Timber Rd)

The 454 Ave corridor was identified as a paved corridor with a narrow driving surface. The corridor is 5 miles from SD 50 to Timber Rd. This corridor is functionally classified as a minor collector. The Myron Grove River Access to the Missouri River is approximately 1.5 miles south of Timber Rd, and this stretch (township road) has been considered for jurisdictional transfer to Clay County and be paved.

During the 5-year crash reporting period, there were five crashes: four were animal-related, and one was a run-off-the-road with alcohol as a contributing factor.

The roadway was measured at 20.5 feet wide at the sample location.

Analysis: Past traffic counts show a daily traffic volume of 101 vehicles per day. A road width of 20.5 feet is less than desirable for two vehicles that approach one another from opposite directions, especially if either of the vehicles are trucks or agricultural equipment. Therefore, there is little room for error for vehicles that veer from the driving lane. By widening or reconstructing the corridor, additional right-of-way (ROW) may be required to chase traversable slopes and match existing ditch grading. Continuing to build up the road thickness will make the road narrower and/or the slopes steeper.

Photos: 454 Ave between Jetley Park St & 316 St, looking north, looking south

Improvement Alternatives:

- Do nothing
- Widen road and shoulders
- Performance-Based Practical Design
- Reconstruction

Timber Road Corridor (454 Ave to Meckling Rd)

Photos: Timber Rd west of Meckling Rd, looking west (top), looking east (bottom three)

The Timber Rd corridor was identified as a paved corridor with a narrow driving surface and steep inslopes. The corridor is 3.3 miles from 454 Ave to Meckling Rd. This corridor is functionally classified as a major collector. The Myron Grove River Access to the Missouri River is approximately 1.5 miles south of Timber Rd at the intersection of 454 Ave.

During the five-year crash reporting period, there were two crashes, and they were both wild animal related.

The roadway was measured at 21 feet wide at the sample location. At least one location had inslope that appeared to be steeper than 3:1 with approximately 7-foot drop.

Analysis: Past traffic counts show a daily traffic volume of 191 vehicles per day. A road width of 21 feet is less than desirable for two vehicles that approach one another from opposite directions, especially trucks or agricultural equipment. Therefore, there is not much room for error for vehicles that veer from the driving lane. Steep inslopes may be non-traversable (steeper than 3:1 rate) by errant vehicles leading to high likelihood of overturning. By widening or reconstructing the corridor, additional ROW may be required to chase traversable slopes and match existing ditch grading. Continuing to build up the road thickness without removing any material will make the road narrower and/or the slopes steeper.

Improvement Alternatives:

- Do nothing
- Guardrail for locations that have non-traversable inslopes.
- Widen road and shoulders
- Performance-Based Practical Design
- Reconstruction

Intersection of Bluff Road & 456 Avenue

The intersection of Bluff Rd & 456 Ave was identified as an intersection with non-ideal geometry, a 3-way intersection with two skewed tangent approaches. Bluff Rd is a paved county road that approaches in the northwest-southeast direction while 456 Ave is a paved county road that runs north of the intersection. There is also a short, paved connection extending from 456 Ave to an approximately 90-degree angle intersection with Bluff Rd.

The primary traffic movement is southbound left turns and northwestbound right turns, as this is a primary travel route between Vermillion and Wakonda. This route is functionally classified as a major collector. Daily traffic volume is approximately 250 vehicles per day along Bluff Rd to the southeast, and 146 vehicles per day along 456 Ave to the north. Peak hour traffic count samples were collected to better understand the traffic movements and driver behavior. There were 22 vehicles that entered the intersection during the peak hour.

The intersection has received safety complaints, though there were no reported crashes during the 5-year crash reporting period.

Analysis: Observations of traffic behavior during the peak hour confirmed that the primary routes are southbound left turns and northwestbound right turns. This movement is often high speed (speed limit 55 mph, advisory speed 35 mph). The primary safety concern is the southeastern tangent approach, where a northwestbound vehicle on Bluff Rd may inadvertently continue through and risk a head-on collision with a vehicle traveling southeastbound from 456 Ave to Bluff Rd. There are also skewed sightlines with an uphill grade to the north of the intersection.

It is recommended that the intersection is reconstructed to improve skewed sightlines by considering a new design alternative such as a 3-Way "T" Intersection. See Alternatives on the next page.

Photos: Intersection of Bluff Rd and 456 Ave. looking north towards hill (top), looking northwest towards intersection (middle), looking south towards intersection (bottom)

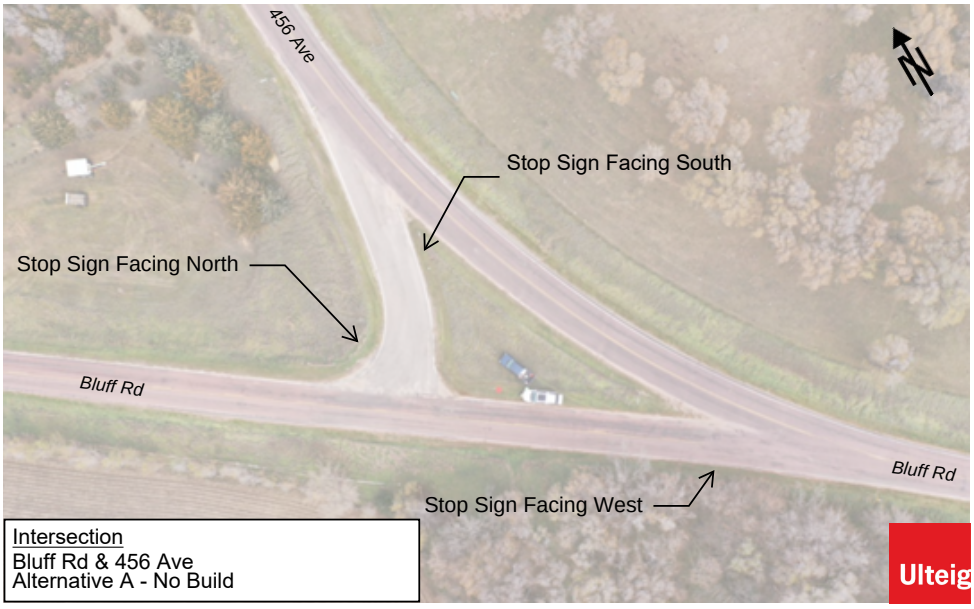


Figure 15. Bluff Rd & 456 Ave: Alternative A: No Build

Alternative A – No Build

Proposed intersection would not be constructed.

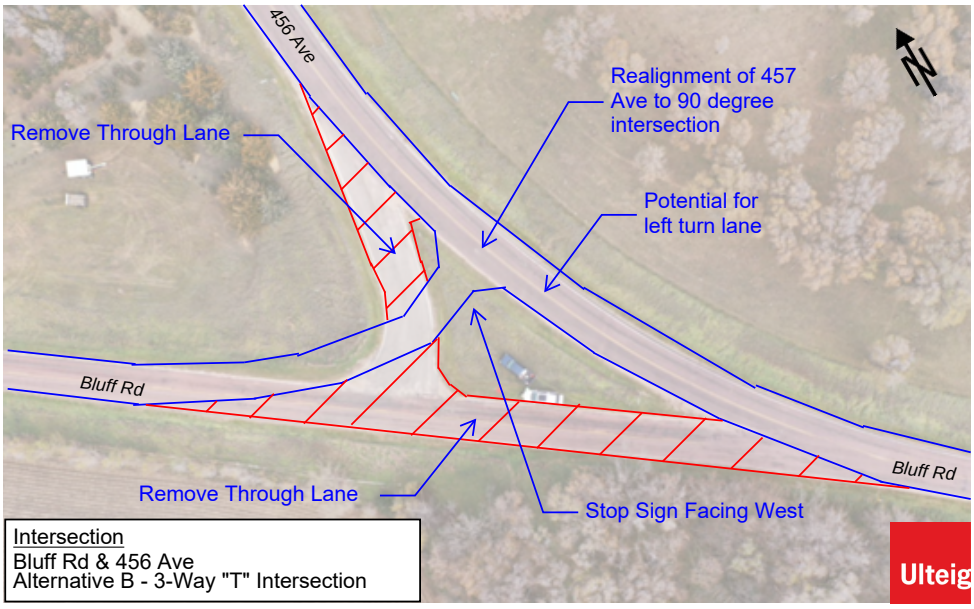


Figure 16. Bluff Rd & 456 Ave: Alternative B: 3-Way "T" Intersection

Alternative B – 3-Way "T" Intersections

The intersection becomes a 90-degree approach at the mid-point of the curve. With this alternative, the primary north to southeast vehicle traffic retains high speed without having to stop. The only approach would be a 90 degree approach to improve sight lines for turning traffic. Turn lanes could potentially be added if volumes are high enough to warrant it. The grading to the north could also be slightly leveled out to improve sight distance to the north.

Intersection of Bluff Road & 457 Avenue

The intersection of Bluff Rd & 457 Ave was identified as an intersection with non-ideal geometry, a skewed 4-way intersection with two slip lanes (Figure 17). Bluff Rd is a paved county road that approaches in the east-west direction. 457 Ave is a paved county road on the south approach, but a gravel township road to the north. There are two paved two-way slip lanes, one each in the southwest and southeast quadrant. There is also a short gravel connection along 457 Ave between Bluff Rd and the southern tangent of the southeast slip lane.

The primary traffic movement is eastbound right turns and northbound left turns, as this is a primary route between Vermillion and Wakonda. This route is functionally classified as a major collector. Daily traffic volume is approximately 250 vehicles per day along Bluff Rd to the west and 254 along 457 Ave to the south. Peak hour traffic count samples were collected to better understand the traffic movements and driver behavior.

The intersection has received safety complaints, though there were no reported crashes during the 5-year crash reporting period.

Analysis: In short, this intersection would never be designed in this manner in 2022. It could be argued that this intersection is actually made up of five closely spaced intersections or conflict areas. The intersection has received safety complaints, and an assessment by SDDOT communicated to the County was that the intersection has minimal history of crashes, and thus, changing signage without other improvements may not improve the situation, and possibly make it worse.

Photos: Intersection of Bluff Rd and 457 Ave, looking northwest towards intersection (top), looking north towards intersection (middle), looking west (bottom)

Observations of traffic behavior in the peak hour confirmed that the primary routes are eastbound right turns and northbound left turns. This movement is often high speed (speed limit 55 mph, advisory speed 35 mph) The primary safety concern is the conflict of northbound left turns with eastbound through traffic, as both are free movements. Because both routes are paved, both drivers would likely believe they have the right of way in the event that two drivers arrived at the same time. The potential for a severe head-on collision is apparent, and the likelihood of its occurrence grows with time. Driver observations indicated that drivers make the turn at full speed.

Intersection of Bluff Rd and 457 Ave, looking west from center of intersection. The vehicle pictured is following the high speed slip lane (northbound left turn), which is a free movement. If another vehicle were making an east though movement at the same time, there is no sign control for either vehicle, and a serious head-on collision could occur. Previous assessment by SDDOT suggested that changing sign control without geometric improvements may not improve the situation, and possibly make it worse. It is recommended to reconstruct this entire intersection with one of the alternatives suggested.

It is recommended that the intersection is reconstructed to remove conflicting right of way, replace unexpected traffic control, and improve skewed sightlines by considering new design alternatives.

Alternative A – No Build Proposed intersection would not be constructed.

Alternative B – Conventional 4-Way Intersection The intersection would be realigned to a conventional 90-degree approach from all four directions. Both slip lanes would be removed. It could be two-way stop or all-way stop controlled.

Alternative C, Option 1 – Conventional 4-Way Intersection with Low Speed Eastbound Right Turn Slip Lane The intersection would add to Alternative B by adding a low speed slip lane for eastbound right turn traffic only. It would be important to prevent northbound left turns from driving the wrong way down the slip lane as previously accustomed.

Alternative C, Option 2 – Conventional 4-Way Intersection with High Speed Eastbound Right Turn Slip Lane The intersection would build on Alternative B by adding a high speed slip lane for eastbound right turn traffic only, roughly following the old slip lane alignment. It would be important to prevent northbound left turns from driving the wrong way down the slip lane as previously accustomed.

Alternative D – Two 3-Way "T" Intersections The intersection becomes two intersections. With this alternative, the primary west-south movements retain the high speed movement without having to stop. Both intersections would be 90-degree approaches to improve sight lines for turning traffic. Turn lanes could potentially be added if volumes are high enough to warrant it.

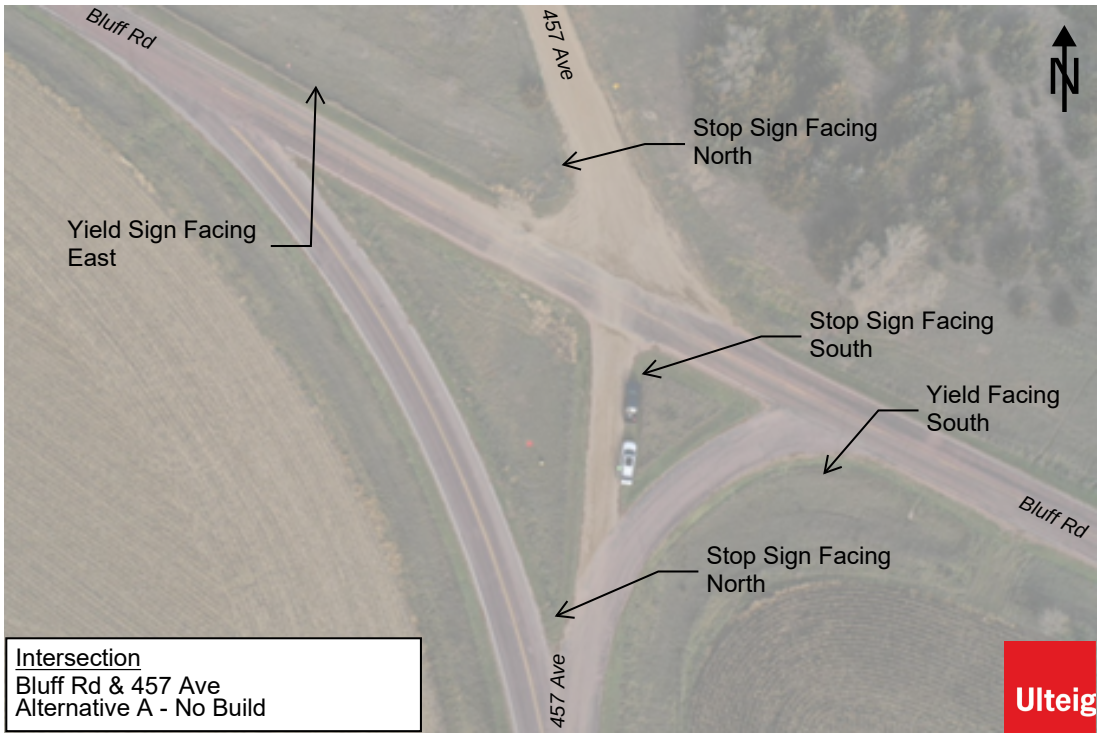


Figure 17. Bluff Rd & 457 Ave: Alternative A: No Build

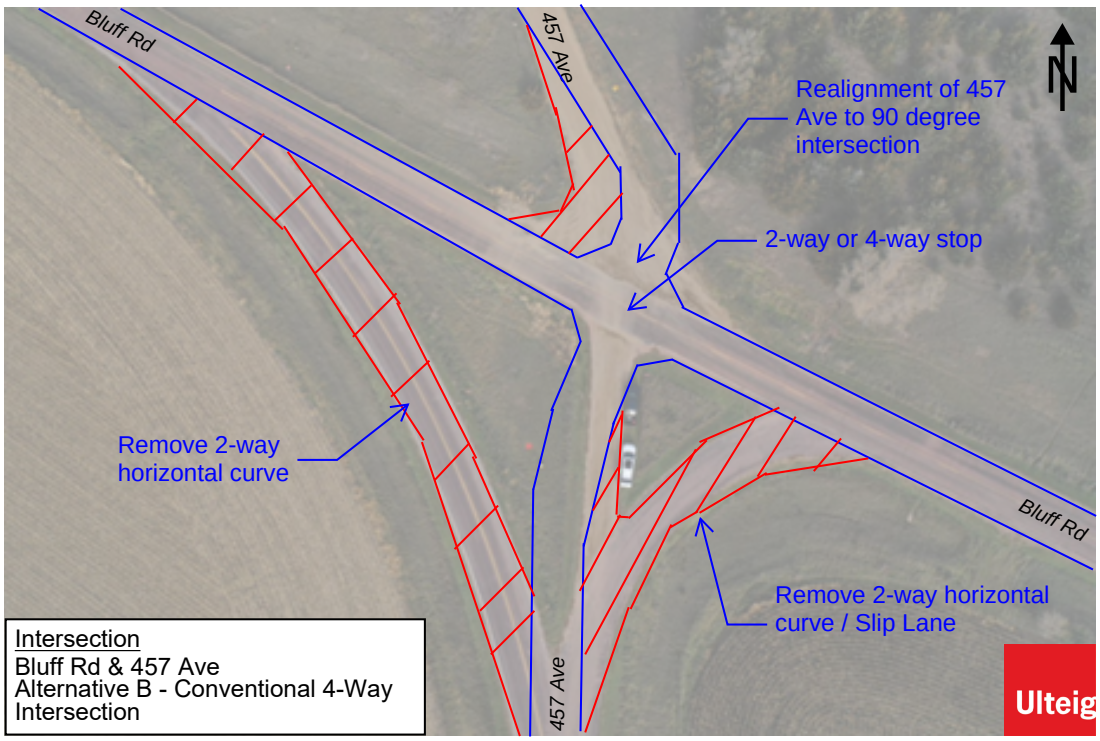


Figure 18. Bluff Rd & 457 Ave: Alternative B: Conventional 4-Way Intersection

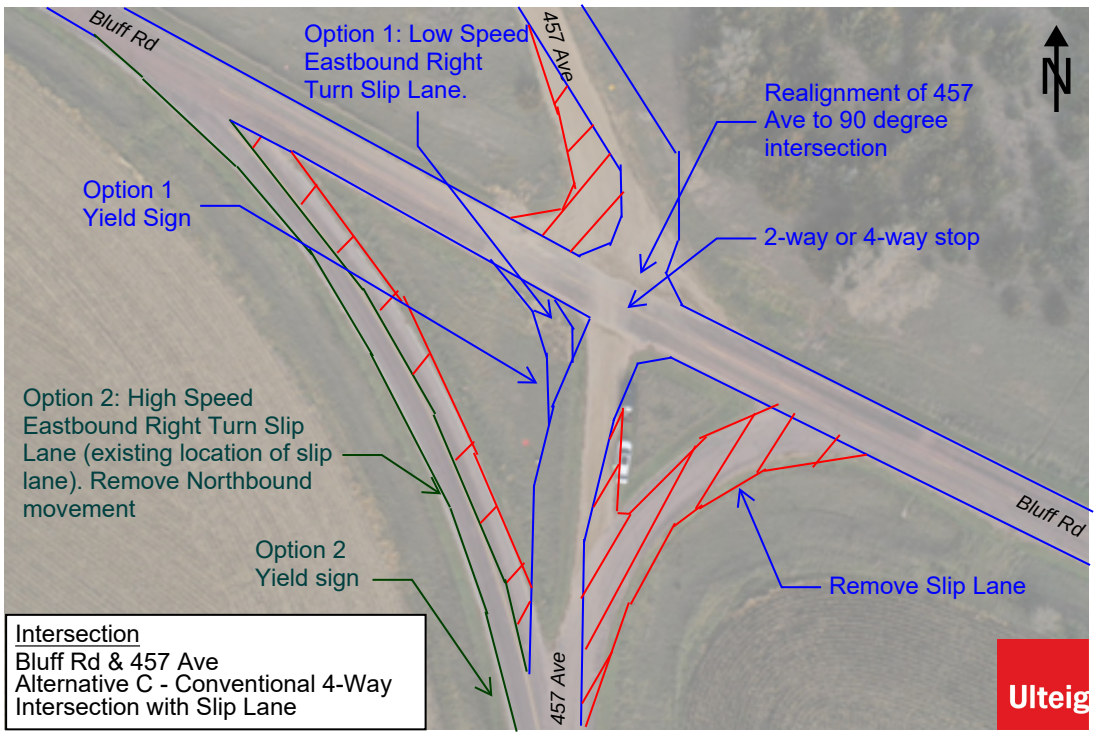


Figure 19. Bluff Rd & 457 Ave: Alternative C: Conventional 4-Way Inters. with Slip Lane

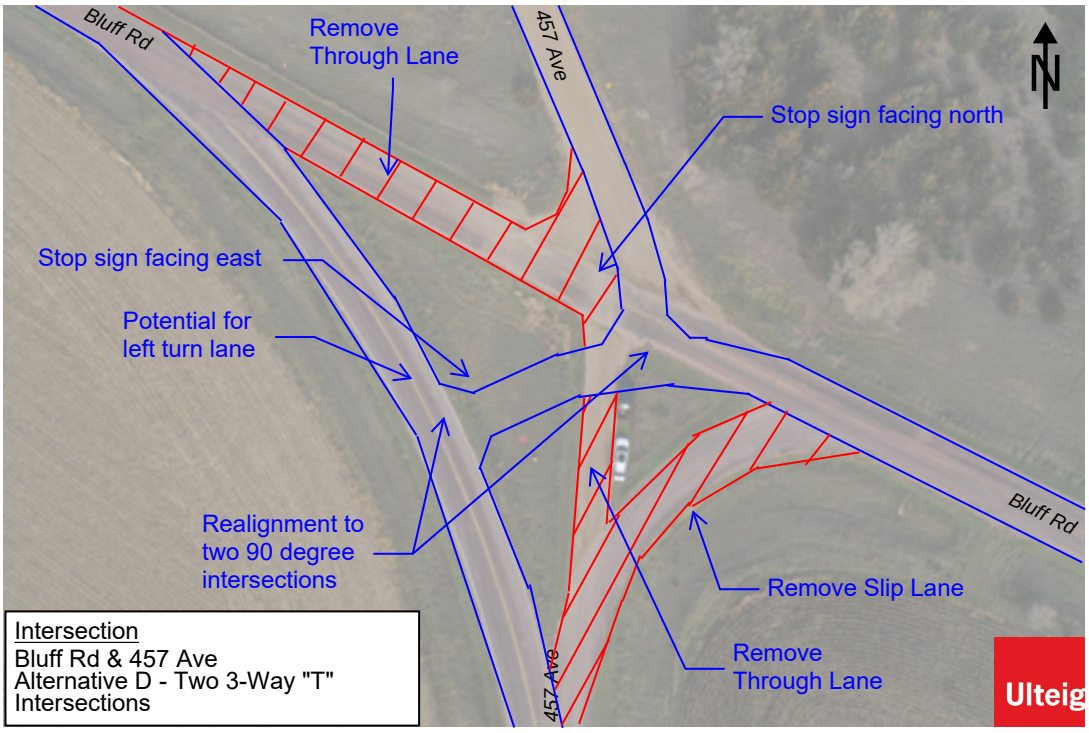


Figure 20. Bluff Rd & 457 Ave: Alternative D: Two 3-Way "T" Intersections

457 Avenue Corridor (Bluff Rd to SD 50)

Photos: 457 Ave north of 313 St, looking south (top), looking north (bottom three)

The 457 Ave corridor was identified as a narrow, paved corridor with a narrow culvert structure parapets. The corridor is 4.4 miles from Bluff Rd to SD 50. This corridor is functionally classified as a major collector. The unincorporated community of Meckling lies at the south end of the corridor, on the other side of SD 50.

Four crashes occurred during the 5-year crash reporting period. Two crashes were failure to yield at the intersection of 313 St, one crash was due to a wild animal hit, and one crash was a run-off-the-road influenced by alcohol use.

Seven bridge or box culvert structures were identified with vertical parapets or guardrail where the inside gap width across the road between the inside edges of the parapets or guardrail measure anywhere from 23.8 feet to 32.2 feet. (From north to south, widths in feet are 32.2, 29.7, 29.8, 29.6, 30.0, 23.8, 26.1)

Analysis: Past traffic counts show a daily traffic volume of 254 vehicles per day. This narrow road includes narrow structures with vertical parapets. When two vehicles approach one another from opposite directions, there is little room to maneuver, especially if either of the vehicles are trucks or agricultural equipment. By widening or reconstructing the corridor, additional ROW may be required to chase traversable slopes and match existing ditch grading. Continuing to build up the road thickness without removing any material will result in narrower roads and/or steeper slopes.

Improvement Alternatives:

- Do nothing
- Widen road, shoulders, and replace structures that have vertical parapets.
- Performance-Based Practical Design
- Reconstruction

306 Street Corridor (452 Ave to 470 Ave)

The 306 St corridor was identified as a narrow, paved corridor. The corridor is 18 miles from 452 Ave to 470 Ave (west county line to east county line). This corridor is functionally classified as a major collector. East of the county line, 306 St meets an interchange with full access to I-29 in Union County.

Photos: 306 St, looking east in area of frequent flooding

During the 5-year crash reporting period, there were 30 crashes along the 18-mile corridor. 3 of the crashes had severe injuries, including 1 fatality. 15 of the crashes were wild animal hits, 6 angle crashes, 6 run-off-the road, 2 sideswipe, and 1 domestic animal hit. The fatality was a run-off-the-road and had alcohol as a contributing factor.

Two bridge structures were identified with curb/guardrail where the inside gap width across the road between the barriers measure anywhere from 30.0 feet.

Analysis: Past traffic counts show a daily traffic volume of 316-436 vehicles per day. When two vehicles approach one another from opposite directions on a narrow driving surface, there is not much room to maneuver, especially if either of the vehicles are trucks or agricultural equipment. By widening or reconstructing the corridor, additional ROW may be required to chase traversable slopes and match existing ditch grading. Continuing to build up road thickness without removing any material will result in narrower roads and/or steeper slopes.

Improvement Alternatives:

- Do nothing
- Widen road and shoulders
- Performance-Based Practical Design
- Reconstruction

Bluff Road Corridor (452 Ave to SD 19)

Photos: Bluff Rd, looking east at 456 Ave (top), looking west at 457 Ave (middle), looking east at 457 Ave (bottom)

The Bluff Rd corridor was identified as a narrow, paved corridor with narrow structure guardrails. The corridor is approximately 15.9 miles from 452 Ave to SD 19. This corridor is functionally classified as a minor collector, except between 456-547 Ave (1.1 miles) and 313 St-SD 19 (3.9 miles), where it is a major collector. This meandering road generally follows the low elevation side of geological bluffs.

During the 5-year crash reporting period, there were 16 crashes. 11 of the crashes were wild animal hits, 4 run-off-the-road, and 1 angle crash.

Three structures were identified with guardrail where the inside gap width across the road between the inside edges of the guardrail measure 32.1, 29.5, and 32.1 feet wide.

Analysis: Past traffic counts show a daily traffic volume of 123-156 vehicles per day for the majority of the corridor. Traffic is highest near the Vermillion landfill with 500 vehicles per day, and approximately 250 vehicles per day between 456-457 Ave. As two vehicles approach from opposite directions on a narrow driving surface, there is little room to maneuver, especially if either of the vehicles are trucks or agricultural equipment. By widening or reconstructing the corridor, additional ROW may be required to chase traversable slopes and match existing ditch grading. Continuing to build up the road thickness without removing any material will make the road narrower and/or the slopes steeper.

Improvement Alternatives:

- Do nothing
- Widen road, shoulders, and replace structures that have vertical parapets.
- Performance-Based Practical Design
- Reconstruction

Fairview Avenue Corridor (SD 50 to Burbank Rd)

The Fairview Ave corridor was identified as a gravel road with poor sight distance and roadside hazards near winding horizontal curves. The corridor is 1.5 miles from SD 50 to Burbank Rd. The geometry concerns are south of 318 St. This corridor is functionally classified as a major collector between SD 50 and 318 St, and local road between 318 St and Burbank Rd. This north-south road is approximately 1.25 east of the City of Vermillion's east edge, and in a potential growth area. Safety concerns are in the vicinity of a geological bluff.

During the 5-year crash reporting period, there was one crash, which occurred at the intersection of SD 50.

Analysis: Past traffic counts show a daily traffic volume of 90 vehicles per day. The winding road running through the geological bluff presents horizontal curves and vertical grades, and it is difficult to see around trees that are near the edge of the driving surface. The road received recent improved signage delineating the curve and edges of road. The inslopes are very steep (steeper than 2:1 rate) in places, are not protected by guardrail, and errant vehicles would overturn. Current traffic volumes are low, but they could increase if Vermillion growth continues to the east.

Improvement Alternatives:

- Do nothing
- Clear trees that obstruct view around curves, stabilize inslopes, construct guardrail in areas with non-traversable inslopes

Photos: Fairview Ave, south of 318 St, looking north towards bluff (top), looking south from top of bluff (middle), looking south from within bluff at steep drop-off (bottom)

Flood Prone Locations

There were eight flood prone locations identified in early discussions with Clay County. The locations are particularly prone to flooding during the spring thaw, but also during heavy rain events. As a result, a flooding focus group was convened with the SAT to better understand the issues. A figure was developed that best highlighted the discussion points, seen in Figure 30 in Section 5. Some of these locations occur more frequently than others, but all were noted as having significant impact to drivers trying to get to destinations, including school bus routes and emergency services.

Improvement Alternatives:

- Flood maps that indicate emergency services routes
- Floodways
- Geomorphic design of floodplain drainageways
- Grade raises

Other Alternatives:

- Minimum Maintenance
- No Maintenance
- Abandonment (road closure or road vacation)

Photos: Flooding at several locations in Clay County

Railroads, Freight, Airports, and Parks

RAILROADS

Burlington Northern/Santa Fe (BNSF) is the only railroad line that serves Clay County (Table 9). The BNSF railway line roughly follows SD 50 southeast/northwest from Gayville (Yankton County) to Vermillion, and then roughly follows Burbank Rd toward Elk Point (Union County). With approximately one train per day, the BNSF railway does not run on a consistent schedule as it heavily depends on crew availability. As part of the maintenance of its railroad crossings, the BNSF tries to upgrade at least one crossing each year.

Table 9. Existing At-Grade Railroad Crossings on Clay County Roads

County Road	Location	Railroad Ownership
452 Ave	Between 310 St and SD 50	BNSF
313 St	Between SD 50 and 456 Ave	BNSF
Meckling Rd / 457 Ave	Between 313 St and SD 50	BNSF
315 St	Between SD 50 and 459 Ave	BNSF
Dakota St	Between Chestnut St and Broadway St	BNSF
Saginaw Ave	Between Burbank Rd and 321 St	BNSF
Burbank Rd / 467 Ave	Between 319 St and 321 St	BNSF
469 Ave / White St	Between 320 St and Burbank Rd	BNSF

Source: U.S. Census Bureau

FREIGHT

The trucking industry helps move goods of some of the industries in and around Clay County, such as meat processing plants, ethanol plants, grain, feed, dairy, agricultural, and other general commodities. Much of the grain produced in Clay County travels north or east to Beresford (Union County), Hudson (Lincoln County), or to Chancellor (Turner County) ethanol plants.

Most rural areas in South Dakota were constructed with designs that did not account for modern freight loads, and heavy truck travel patterns also change over time. It is challenging for the County to maintain roadways that were not originally designed to carry regular heavy vehicle loads. Specifically, 452 Ave, 306 St, and Bluff Rd were mentioned or identified in early discussions as routes that are either featuring heavy traffic or are likely under-designed to support current traffic loads. Additionally, South Dakota laws are comparatively lenient on the size of farm equipment (so as to support the agricultural industry economy), which in addition to the weight, often have wheel-bases wide enough to damage the integrity of township road shoulders.

Clay County implements Springtime load limits, implemented in coordination with Yankton and Union Counties. In 2022, Clay County load limits were 6 tons per axle for paved roads with the exception of Bluff Rd from SD 19 to 313 St. Gravel roads were 7 tons per axle, or as posted. All roads could not exceed 80,000-lbs gross vehicle weight (GVW). The period of time that these load limits may be in place can be from February 15 to April 30. These load restrictions protect highways during the spring thaw, which is the time when roads are most susceptible to damage from heavy loads. During the spring, the frozen ground thaws from the top down, and there is a period of time where moisture laden pavement and base material is caught between the heavy loads above it and the frozen subgrade beneath it. By protecting the highways during this time, Clay County is protecting its largest assets and investments.

AIRPORTS

Clay County is mainly served by a few small airports and a few private airstrips, including the following:

- Harold Davidson Field-VMR – public
- Ward Airfield – private
- Lodi Airport-0SD1 – private
- Bixler Ridge Airport-2SD8 - private

The City of Vermillion has owned and operated Harold Davidson Field since 1957. Since then, the City has strived to provide a safe airport for its citizens, flying public and aeronautical service providers. The City requires that all commercial activities operating out of the airport adhere to the City's Minimum Standards for Operators of Commercial Activities.

NATIONAL PARKS AND STATE PARKS

Many great parks, nature preserves, and vital wildlife production areas are located in Clay County and adjacent counties. Clay County Park near the Missouri River is a popular destination as well as Spirit Mound Historic Prairie. Parks like these bring exceptional scenic value to the county, thus opportunities exist to connect the county's state parks to a trail network.

Photo: Spirit Mound Historic Prairie State Park

Bicycles, Pedestrians, and Transit

BICYCLE AND PEDESTRIAN FACILITIES

Clay County has an existing but somewhat disconnected bicycle, pedestrian, and trails network. Some sidewalks and trail networks exist in the cities, towns, and parks of Clay County. Public feedback has indicated more demand for these types of facilities, especially where none exist. Some specific multi-modal facilities were identified during the review process and are presented in Section 5 as preferred routes for multimodal enhancement.

A tremendous economic development opportunity exists in the development of a Clay County trails network and other bicycle and pedestrian-oriented improvements. For instance, potential for extra buffer space between roadways and sidewalks, on-street bicycle infrastructure, and a trails network can provide Clay County with a more robust multi-modal transportation network that will attract more users, tourism, and spur economic development. There will also be opportunities to upgrade pedestrian crossings for increased safety, though no specific crossings were identified during initial reviews.

A review of City of Vermillion 2022 budget[10] indicated the City will be replacing a section of bike path that was washed out during flooding:

> *"The Hike/Bike Path Fund utilized a federal grant and a local match to enhance the existing trail system in Vermillion. Unfortunately, portions of the hike/bike trail along the Vermillion River were severely damaged or are no longer safe due to floods and natural river erosion. The Second Penny Fund will transfer $225,000 to this fund in 2022 to help provide for replacement of sections of the Vermillion River Hike/bike path. The project was delayed from 2021 construction as it worked through needed State approvals. The approval process should be completed and allow for construction in 2022. This funding will be combined with approximately $80,000 of federal funding that remains for the project."*

It is worth noting that as Clay County embarks on a 20+ year program of trails projects as set forth in this plan, not all trails need to be constructed of concrete or asphalt. Regional trails, especially trails in flood plains and along rivers can be satisfactorily functional using a loose surface treatment (singletrack) or using gravel in areas that are regularly saturated. Loose surface trails away can easily be re-cleared and restored at a low cost if washed away.

10 City of Vermillion. 2022 Budget. https://www.vermillion.us/DocumentCenter/View/2108/2022-Budget-Bookpdf

TRANSIT FACILITIES

An efficient transit system is essential to meet mobility needs, accelerate sustainable development, and provide for a high quality of life for people of all income levels, ages, and abilities. The American Public Transportation Association (APTA) identified that approximately 9% of transit trips in areas with populations less than 200,000 were for medical reasons.

Transit service in Clay County is currently provided by the Vermillion Public Transit and sponsored by SESDAC serving in-town trips, and out of town trips including: Burbank, Meckling, Elk Point, Yankton, Dakota Dunes, and Sioux City. Vermillion Public Transit also provides a free Safe Ride home service on Friday and Saturday nights from 10:00 P.M to 3:00 A.M. Vermillion Public Transit Vehicles carry bike racks.

For long distance transit, Jefferson Lines is a bus service in the Midwest with regional destinations across 14 states, and includes nearby destinations of Sioux City, Vermillion, and Sioux Falls.

Clay County has an opportunity to adopt additional policy language supporting additional regional and statewide transit. As the population of Clay County ages, residents wishing to remain in Clay County may or may not be able to drive as they age.

Transit issues and needs identified:

- Access to public transit is limited by travel times and distances
- Service throughout most of Clay County is Call and Ride only and must be scheduled
- Mobility issues relating to transit dependent populations
- Limited funding to increase or expand transit services
- Lack of ITS projects such as real time route information for riders

Clay County should consider allocating funding contributions in support of local transit facilities, which would help serve the demand for transit in Clay County, particularly for the transit-dependent population in greater Clay County.

Ordinances, Guidelines, and Design Standards

County ordinances pertaining to transportation planning were reviewed as part of this study. The purpose of these existing regulations is to provide guidance for future development, as well as incorporating best practice for county growth management strategies. Among other purposes, they provide for predictability, methodology, and justification to control land use and development, promote public interest, improve physical environment, fuse long-range considerations with short-range actions, and effect jurisdictional coordination. Clay County ordinances pertaining to transportation planning were reviewed as part of this study and are summarized below:

- Though not directly standardized by Clay County policy, road design is promoted by the guidelines proposed by the American Association of State Highway and Transportation Officials (AASHTO) and the SDDOT Local Roads Plan (2011).
- The Clay County Comprehensive Plan (Draft) also sets a general guideline for future planning decisions, particularly to guide Clay County and the City of Vermillion in implementation of zoning regulations, subdivision regulations, capital improvement plans, and other related policies. The related 2017 Revised Clay Count Zoning ordinance and the Joint Zoning Regulations for Clay County and the City of Vermillion ordinance incorporate zoning district boundaries, articles of regulations, requirements for building permits, off-street parking, signage, and others.
- The Flood Damage Prevention ordinance regulates development in special flood hazard areas as recommended by FEMA.
- The Subdivision ordinance has minimum requirements for road improvements and design standards within subdivisions.
- The Wheel Tax ordinance imposes a $4.00 per wheel tax on all motor vehicles registered in Clay County (maximum of $16.00 per vehicle), which also earns Clay County eight points as part of SDDOT Bridge Improvement Grant (BIG) applications.[11]

Many of the components, standards, and guidelines described within Section 5 of this report may be integrated into Clay County permit processes and ordinances if appropriate.

11 South Dakota Department of Transportation. Bridge Improvement Grants. https://dot.sd.gov/doing-business/local-governments/bridge-improvement-grants

SUBDIVISIONS

Clay County has a subdivision ordinance (Ordinance No. 2014-01), which states minimum requirements for road improvements and design standards within subdivisions. Articles 1 through 13 provide a detailed description and general overview of the subdivision plans, approval process, preliminary plans, and minimum road improvement standards. The design standards, located in Article 8 Sections 801 through 804, provide a detailed description of the road arrangement and design, minimum road right-of-way, road construction, and road naming conventions. Specific attention should be given to Section 803 – Road Construction – and its subsections, as these will be most important for maintaining minimum requirements. Some of the subsections that relate to road design are listed below, but the ordinance itself contains the complete list.

- Minimum roadway width shall be 28 feet from shoulder to shoulder. There will be a minimum of 24 feet width driving surface. Ditches and driveways shall have a maximum side slope of 4:1.
- Gravel roads shall have an initial three-inch lift of gravel spread over the driving surface. This lift shall be allowed to settle over one winter season. A second three-inch lift of gravel shall be spread over the driving surface within one year of the first lift.
- Asphalt and Portland cement concrete surfaces shall be constructed in accordance with specifications of the Highway Superintendent. At a minimum, there shall be a nine-inch granular base course with a three-inch asphalt surface for a residential development and an eight-inch granular base course with a four-inch thickness of asphalt for a commercial or industrial development. If Portland cement is used, the granular base as a minimum, should be six inches with a seven-inch thickness of Portland cement.
- A cross slope (crown) shall be provided on all roads at a rate of 0.04 feet per foot.
- The road ditch shall be at least 3 ½ feet below the road grade.

In addition, Section 802 – Minimum Road Right-of-Way – shall be considered part of the minimum design standards. Its subsections are as follows:

- Roads shall have a minimum publicly dedicated right-of-way of 80 feet. An easement of 80 feet shall be reserved for private roadways. A maximum right-of-way of 100 feet may be required on any roads designated as arterial and collector.

This MTP does not add to the subdivision ordinance, but it is mentioned here as reference for some road design standards built away from the county highway network.

ACCESS MANAGEMENT

Clay County does not currently have an access management policy or ordinance in place (sometimes referred to as a driveway ordinance). If a property along a county road proposes to add an access or driveway, the property owner is directed to work with the Clay County Highway Department to obtain a permit at a cost of $75.00 and complete an application for entrance from a Clay County highway. The permit also needs approval from the Clay County Commission with application for occupancy on the right of way of county highways. Costs to install the access are at the owner's expense and must follow the Clay County Highway Department specifications, which specify width of access, culvert type, culvert slope, inslope rate, fill type, and surfacing type.

Growth and Development

A challenge facing Clay County is the growth and development of Vermillion, which brings more traffic and loading on county-owned roads. Of note, Vermillion is planning a major downtown streetscape enhancement project, which when combined with a future countywide trails network will make Clay County a very desirable place to live. The effects of economic development and growth in Clay County not only leads to more jobs and growth of local businesses, it also can lead to traffic congestion, and in some cases increases in crashes and pedestrian fatalities. In recognition of this challenge, the two entities have created a joint jurisdiction agreement.[12] This ordinance regulates zoning and jurisdictional areas. The regulations "*are intended to preserve and protect existing property uses and values against adverse or unharmonious adjacent uses outside the corporate boundaries of the City of Vermillion*" to carry out the goals and objectives of the plan.

JOINT JURISDICTION

Clay County shares joint jurisdiction with the City of Vermillion in a "transition area" surrounding Vermillion, seen in Figure 21.[13] As described in the Clay County Comprehensive Plan (Draft), counties and cities can work together for joint benefits, but "the granting of joint jurisdictional power is at the county commission's discretion and is not a right of the municipality." The comprehensive plan has more details regarding the guiding policies of transition areas and procedural requirements for joint zoning and jurisdiction. Clay County also has its own zoning ordinance and map found on its webpage.[14]

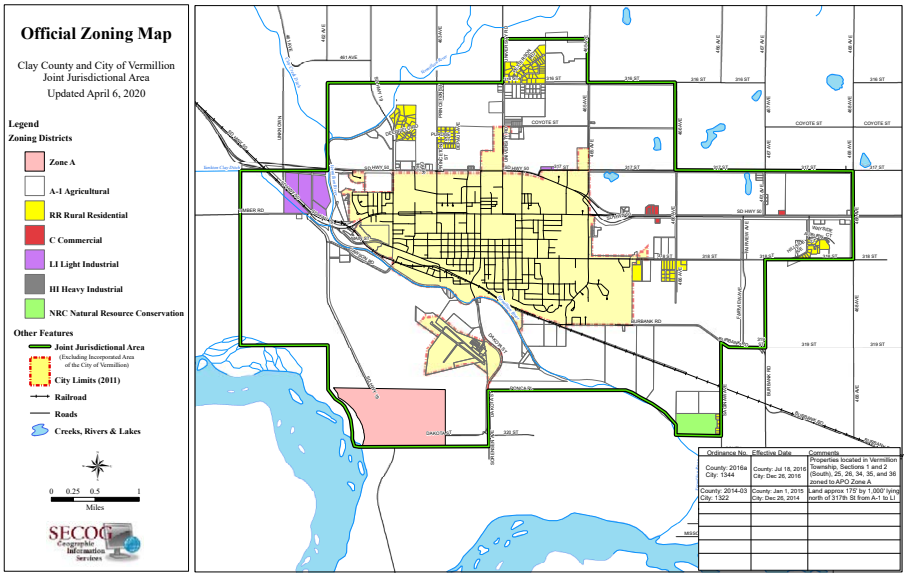


Figure 21. Joint Jurisdiction Zoning Map

12 Clay County Planning Commission, City of Vermillion Planning Commission, Clay County Board of Commissioners, and the Vermillion City Council. Joint Zoning Regulations for Clay County and City of Vermillion (2021). https://www.claycountysd.org/zoningjointjurisdiction.cfm

13 Figure 21. Clay County and City of Vermillion Joint Jurisdiction Zoning Map (updated April 6, 2020). https://www.claycountysd.org/zoningjointjurisdiction.cfm

14 Clay County Zoning Map (2018). https://www.claycountysd.org/zoningcounty.cfm

Public Input Internet Based Survey

Public Meeting #1 featured an internet-based public survey open from March 25 through April 25, 2022. Stakeholders identified by the SAT were emailed direct invitations and public notices were advertised in official Clay County newspapers. Social media posts also assisted in the outreach effort and was the top reason respondents had learned about the survey.

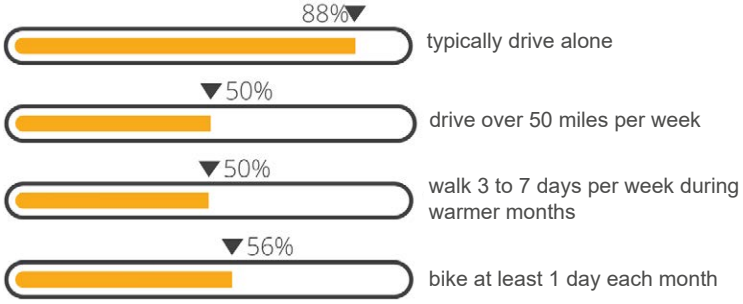
The public survey posed questions relating to the existing transportation network in Clay County. There were opportunities for participants to provide feedback relating to their usage of the transportation network, overall performance, issues and concerns, prioritization of specific types of improvements, and general comments.

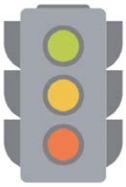
A total of 63 surveys were completed. Some of the results and comments from Public Meeting #1 and the survey are shown in the next page:

KEY CONCLUSIONS DRAWN FROM SURVEY RESULTS

- The primary obstacles mentioned that prevent people from walking and biking more often are lack of bike/pedestrian infrastructure, busy schedules, fear of reckless automobile drivers, and poor weather.
- 16% said quality of Clay County transportation infrastructure is worse than five years ago. 30% said the quality was better.
- Existing Road Maintenance/ Improvements were ranked as the most important project type. Bridge Maintenance/Replacement, Safety, and Bicycle/Pedestrian/ Trails were also listed as projects of high importance.
- 52% said they are at least somewhat supportive of potential transportation fee increases in Clay County to support transportation maintenance/ improvement projects. 18% said they are opposed to it.
- When asked, numerous comments were suggested for additional or improved bike/pedestrian, transit, and roadway facilities.

A comprehensive summary and analysis of public feedback and survey results is in Appendix B.





98%
feel traffic congestion is not a problem or a minor problem

77%
driving or riding in automobiles

62%
walking

40%
cycling

77% feel very safe or somewhat safe driving or riding in automobiles in Clay County. Comparatively, 40% for cycling, 62% for walking.

SAMPLE OF PUBLIC COMMENTS

Safety Feedback	*"People tend to ignore signage and drive very fast without regard for pedestrian or bicycle traffic."* *"Not enough lighting"* *"Dangerous intersection at 457th and Bluff Rd."*
Feedback on Roads and Bridges	*"Deteriorating road conditions."* *"Maintain roads and bridges."* *"Closing a road is not the solution to necessary bridge repair or replacement."*
Active Transportation and Recreation Feedback	*"Would like bike paths that connect to destinations, like Spirit Mound, Clay Creek, Wakonda, Clay County Park, or anywhere along the river."* *"There are no sidewalks hardly anywhere, and the ones that are around are horrible—cracked, unlevel, very narrow, etc."* *"No shoulder on county roads."* *"Lack of bike trails and sidewalks"*
Trails Feedback	*"Having a trails plan in this study is an important part of attaining funding for it. Simply having it is in this plan will increase the chances of receiving funding for trails."* *"I would love to see a trail connecting the Frost Trail to North Alabama Bend Trail and running all the way to Clay County Park."* *"Request for a Vermillion to Yankton Trail Connection."* *"Consider how hunting season may affect location of bike or pedestrian trails."*
Flooding Feedback	*"During flooding, it is problematic for bus routes. Sometimes they can't make pick ups and can only go so far?"* *"Flooding has big impacts to school buses and fire departments."* *"A grade raise acts as a dam and that can cause issues elsewhere."*
Other Feedback	*"More public transport for those that cannot drive. There are a number of those in the community that have to wait for the public transport, which can take a long time given the limited number of public transport."* *"I believe if the county and townships worked together on rural roads improvements could be made. Right now it doesn't appear that townships have the funds to maintain the roads as they should be."*

3. ISSUES AND NEEDS

A list of issues and needs were identified as a result of the baseline conditions analysis, discussions with the SAT, and public feedback. This list forms the basis for the plan recommendations, including new standards, guidelines, and future project implementation.

- **BRIDGE REPLACEMENT**
- **ROAD CONDITIONS**
- **ROAD GEOMETRY AND SAFETY**
- **FLOODED ROADS**
- **DEMAND FOR BICYCLE AND PEDESTRIAN INFRASTRUCTURE**
- **URBAN GROWTH AND DEVELOPMENT**
- **JURISDICTIONAL OWNERSHIP**
- **PRIORITIZING IMPROVEMENTS WITH AVAILABLE FUNDING**

BRIDGE REPLACEMENT

Clay County maintains 75 bridges. As a result of bridge inspections, the condition of bridges falls under one of three categories: Good, Fair, or Poor. Most of Clay County bridges are in Fair or Good condition (80%), but 15 of Clay County bridges are currently in Poor conditions (7%) or closed (13%). Bridges in Poor condition are structurally deficient, and these bridges have short or unknown remaining service lives, likely requiring high-cost repairs or replacement. Comparatively, in all of South Dakota, 25% of all county-owned bridges are in Poor condition. Due to recent bridge closures and replacements, Clay County is far below the state average for county-owned bridges in Poor condition. Closing bridges ultimately decreases connectivity of the network but may be preferrable to excessive cost and safety concerns.

ROAD CONDITIONS

When surveyed about road conditions, respondents generally replied that Clay County roads are in fair or good condition (on a scale of very poor/poor/fair/good/excellent). 30% of respondents said that the quality of Clay County transportation infrastructure is somewhat better or better than it was five years ago. 16% said it is somewhat worse or worse than five years ago. Clay County has introduced microsurfacing as a critical element of the roadway maintenance strategy that also continues to rely on chip seals. Gravel roads also require regular maintenance when deterioration is brought on by traffic and environmental factors.

Most rural areas in South Dakota were constructed with designs that did not account for modern freight loads, and heavy truck travel patterns have also changed over time. It is difficult for the County to maintain roads that were not originally designed to carry regular heavy vehicle loads. Additionally, South Dakota laws are comparatively lenient on the size of farm equipment (so as to support industry economy), which in addition to the weight, often have wheelbases wide enough to damage the integrity of township road shoulders. With heavy vehicles having a particular influence on maintenance cost to gravel roads, the relatively high cost of maintenance of those roads may make a surface conversion from gravel to pavement a cost-effective option.

ROAD GEOMETRY AND SAFETY

Input from Clay County resulted in a special locations analysis that primarily focused on roadway geometry and safety. Two rural intersections were highlighted with geometric safety concerns: Bluff Rd & 456 Ave and Bluff Rd & 457 Ave. Other locations identified in the analysis have been noted for roadside hazards because of narrow driving surfaces and steep inslopes, which leaves little margin of error for vehicles if they leave the driving lane. Furthermore, structures with vertical parapets along narrow roads are obstacles for large agricultural machinery.

Safety is a fundamental element when planning transportation infrastructure and improvements. Special attention will be given to roads that have been identified as safety concerns throughout the study area. Data from the South Dakota Accident Records System was compiled from the last five years to help identify potential safety concerns.

FLOODED ROADS

Years ago, the areas near the Missouri River and the Vermillion River were chosen for settlement because of ease of access to the rivers. While this spurred development, it also exposed the area to flooding from these same rivers. Flooding is a major issue in this region of South Dakota, and usually occurs during the spring thaw when ice dams form in constriction areas such as culverts, underpasses, drainpipes, and blocked/clogged channels. These same issues appear to be exasperated by modern tiling of farm fields which cause watershed areas to drain to roadside ditches, creeks, and rivers at a faster rate than in past decades. During times of high water, roads may have to be closed to keep drivers safe. This causes significant impacts to those who need the roads open for travel, deliveries, or emergencies. Additionally, flooding can permanently damage roads and drainage structures such that they need to be replaced at great expense. Flood prone areas were identified in discussions with the SAT. Frequently flooded roads are especially costly to repair, so changing maintenance designation or simply abandoning the roads altogether should be considered. Closing roads ultimately decreases connectivity of the network, but it may be preferable to excessive cost and safety concerns.

DEMAND FOR BICYCLE AND PEDESTRIAN INFRASTRUCTURE

The demand for bicycle and pedestrian infrastructure was noted especially during the public outreach effort of the baseline conditions analysis. Facilities are mostly limited to within city boundaries and state parks. Education for automobile drivers and the cyclists themselves regarding rules of the road were highlighted by public comments as opportunities for improved safety.

URBAN GROWTH AND DEVELOPMENT

Growth and development, especially in the Vermillion area, brings more traffic and loading on the surrounding roads. Development will directly or indirectly impact the Clay County road network, potentially creating deficiencies on existing roads in the area that may need to be upgraded or expanded. Clay County indicated issues with changing traffic levels and patterns near rural subdivisions, access management, and a need to prioritize and future arterials and collectors.

JURISDICTIONAL OWNERSHIP

During the baseline conditions review, it was noted that some county roads are not fully relevant to the county network, which introduces network discontinuity and maintenance inefficiencies. Additionally, jurisdictional ownership does not appear to have been formally transferred to the City of Vermillion in urban areas and city limits, which may not be most beneficial to the County. This situation often arises from the fact that in order to transfer jurisdictional ownership, there must be an agreement reached between two competing governmental agencies, and neither agency wants to receive the worse end of the deal. This competing nature between agencies is common in South Dakota, and mutually beneficial arrangements do not appear to be the norm.

In other instances, the official transfer may not have been formally filed with the SDDOT. In the instance of jurisdictional ownership within the City of Vermillion, it is understood that the formal jurisdictional transfer process has recently begun for multiple road segments within Vermillion city limits. The roads currently in the process of jurisdictional transfer are displayed on Figure 2 (page 7).

PRIORITIZING IMPROVEMENTS WITH AVAILABLE FUNDING

Funding is typically not sufficient to address all project needs and desires, and taxpayers demand that money is used effectively to get the best return on investment. Therefore, project prioritization is a key element presented in this study. The long-term investment return of projects will require thorough planning. This MTP utilizes the planning horizon of 2045 to prioritize projects over the next 20+ years.

It is strongly recommended that Clay County continue to update its 5-Year Highway and Bridge Improvement Plan to identify and prioritize roads for improvement and the structures for rehabilitation and replacement. This short-range planning document is a tool designed to assist the County in budgeting, planning, and incorporating the needs and concerns of the public into annual road and bridge projects. Developing this 5-Year plan and updating it every year by removing or adding projects as needed, will also award Clay County eligibility to receive funding through the local Bridge Improvement Grant (BIG) program established by the SDDOT.

4. FUTURE CONDITIONS

During baseline conditions analysis of this study, existing issues and needs were identified and featured Section 2 of this report. As time passes, these issues will become more prominent and new issues will arise. The analysis in this section aims to forecast future traffic volumes so that future issues and needs may be identified that were not readily apparent during baseline conditions analysis. It is also an opportunity to proactively address issues and correct deficiencies to ensure more safe and sustainable infrastructure for decades to come

Population

The South Dakota State University Census Data Center created preliminary population projections for Clay County in 2010 (Table 10).[15] The population projections indicated growth through the year 2035 similar to the overall growth rate of the State. Based on recent population trends, this expected growth is likely to occur in the Vermillion area.

Table 10. Population Projections for Clay County

Location	2020	2035	Est. % Growth
Clay County	14,967	16,517	10.4%
South Dakota	886,667	977,574	10.3%

Source: South Dakota State University Census Data Center

Clay County may continue to maintain growth moving forward, possibly as a desirable destination for remote workers (work-from-home) who desire to live in small towns and rural places. The University of South Dakota will also continue to be a draw for younger populations.

15 South Dakota State University Census Data Center. Preliminary Population Projections for South Dakota and Counties, 2010-2035 (Accessed through South Dakota Department of Labor & Regulation) https://dlr.sd.gov/lmic/menu_population.aspx

Traffic Forecast

Traffic forecasts were developed for the planning horizon year of 2045. Clay County is not covered by regional traffic demand models, so to forecast future year traffic, annual growth rates provided by SDDOT were used (3.0% linear annual growth rate).

As with the baseline conditions analysis for year 2022, two-lane planning level capacity approach was used as a guide to bring focus to roadways with potential for traffic congestion. As a corridor begins to approach capacity, it will be time to implement improvements. Figure 22 shows forecasted daily traffic volumes and planning level volume to capacity (V/C) ratios along Clay County owned roadways. A V/C ratio of 1.0 indicates that the facility would be at planning-level capacity. However, each individual road has unique design elements that may suggest that the road capacity is higher in reality. For example, if the road is wide enough, queued vehicles may be able to bypass turning vehicles instead of waiting behind them, as seen with most roads in the Vermillion area.

As with existing volumes, Clay County traffic volumes are well below two-lane planning level capacity for the vast majority of roads. Due to urban and suburban nature of Clay County roads within Vermillion and the surrounding areas, some of these roads are showing signs of delays during peak traffic hours. However, almost all of these roads have existing cross sections that can be easily widened to three lanes, if necessary, which would accommodate much larger traffic capacities.

Due to development in the urban and suburban areas of Vermillion, future traffic volumes indicate that some roads may approach or exceed capacity by the year 2045. Where and when this will occur is dependent on a number of variables, but the corridors in the following list are the most likely to be due for capacity improvements such as additional lanes if development in the area continues. The approach below provides an estimated V/C ratio, but further study of turning movements and signal timing may provide a more accurate representation of roadway and intersection performance. It is recommended that traffic operations studies, corridor studies, and/or traffic impact studies should be completed as new development occurs to analyze various design alternatives and cost to make a fully informed recommendation. Also, due to the location of these corridors, the County should proactively begin discussions with Vermillion to formally transfer them to Vermillion jurisdiction.

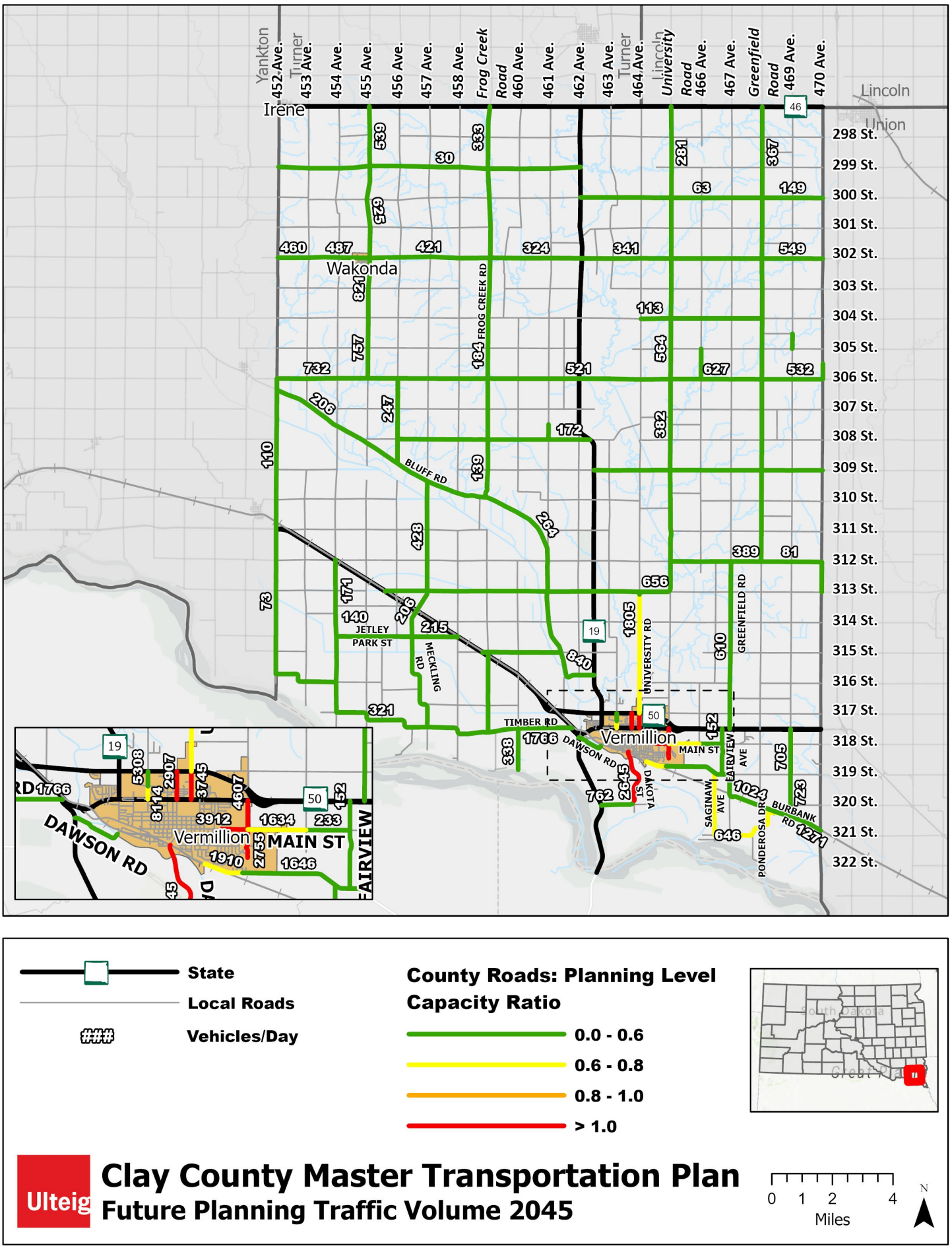


Figure 22: Future Planning Traffic Volume 2045

Dakota St – Between SD 50 and SD 50L/ Cherry St

- 2022 V/C Ratio = 0.69 (YELLOW)
- 2045 V/C Ratio = 1.16 (RED)

Analysis and Recommendation: The 2022 traffic volumes indicate this corridor may be experiencing some traffic delays during peak hours. 2045 traffic volumes with a V/C ratio over 1.0 would likely include excessive traffic delays, but future traffic will vary depending on growth and development of Vermillion. If traffic delays are experienced, the road appears wide enough to accommodate a third lane, which would increase the capacity of the corridor by removing left-turning vehicles from the primary driving lane. Due to the location of this road corridor within the boundaries of the City of Vermillion, it is recommended that it is formally transferred to Vermillion jurisdiction and it is understood that the jurisdictional transfer process has begun for this location.

University St – Between SD 50 and SD 50 L/ Cherry St

- 2022 V/C Ratio = 0.89 (ORANGE)
- 2045 V/C Ratio = 1.50 (RED)

Analysis and Recommendation: The 2022 traffic volumes indicate this corridor is likely experiencing some traffic delays during peak hours. 2045 traffic volumes with a V/C ratio over 1.0 would likely include excessive traffic delays, but future traffic will vary depending on growth and development of Vermillion. If traffic delays are experienced, the road appears wide enough to accommodate a third lane, which would increase the capacity of the corridor by removing left-turning vehicles from the primary driving lane. Due to the location of this road corridor within the boundaries of the City of Vermillion, it is recommended that it is formally transferred to Vermillion jurisdiction and it is understood that the jurisdictional transfer process has begun for this location.

Crawford Rd – Between SD 50 L/Cherry St and Pinehurst Ave

- 2022 V/C Ratio = 0.65-1.09 (YELLOW/ RED)
- 2045 V/C Ratio = 1.10-1.84 (RED)

Analysis and Recommendation: The 2022 traffic volumes indicate this corridor is likely experiencing some traffic delays during peak hours, especially north of Main St. 2045 traffic volumes with a V/C ratio over 1.0 would likely include excessive traffic delays, but future traffic will vary depending on growth and development of Vermillion. If traffic delays are experienced, the road appears wide enough to accommodate a third lane, which would increase the capacity of the corridor by removing left-turning vehicles from the primary driving lane. Due to the location of this road corridor within the boundaries of the City of Vermillion, it is recommended that it is formally transferred to Vermillion jurisdiction and it is understood that the jurisdictional transfer process has begun for this location.

Main St – Between Anderson St and Crawford Rd

- 2022 V/C Ratio = 0.93 (ORANGE)
- 2045 V/C Ratio = 1.56 (RED)

Analysis and Recommendations: The 2022 traffic volumes indicate this corridor is likely experiencing some traffic delays during peak hours. 2045 traffic volumes with a V/C ratio over 1.0 would likely include excessive traffic delays, but future traffic will vary depending on growth and development of Vermillion. If traffic delays are experienced, the road appears wide enough to accommodate a third lane, which would increase the capacity of the corridor by removing left-turning vehicles from the primary driving lane. Due to the location of this road corridor within the boundaries of the City of Vermillion, it is recommended that it is formally transferred to Vermillion jurisdiction and it is understood that the jurisdictional transfer process has begun for this location.

Dakota St – Between Chestnut St and 320 St

- 2022 V/C Ratio = 0.63 (YELLOW)
- 2045 V/C Ratio = 1.06 (RED)

Analysis and Recommendation: The 2022 traffic volumes indicate this corridor may be experiencing some traffic delays during peak hours. 2045 traffic volumes with a V/C ratio over 1.0 would likely include excessive traffic delays, but future traffic will vary depending on growth and development of Vermillion. It should be noted the location of the traffic count was between Chestnut St and Broadway St, so it may not be representative of the full corridor south of Broadway St, which likely has less traffic and is of more rural nature at this time. Therefore, delays are less likely to be experienced in reality. If traffic delays are experienced and capacity deficiencies become apparent, the road may need to be expanded. However, it is unknown what the magnitude of the impact of development will be at this time, if any.

Due to the location of this road near Vermillion city limits, and the discontinuity from the county road network, it is recommended that the County proactively begin discussions with Vermillion and developers on their intentions for future road jurisdiction and potential annexation. If future traffic studies show impacts by future development, the County could enter into a cost sharing agreement with Vermillion. This agreement could include upgrades to the road network and/or general maintenance. The amount of cost sharing between the two government entities would be based on the existing traffic on the county road versus the amount of traffic added by the development. For instance, if the existing ADT of a county road is 1,000 vehicles per day and the trip generation report for the development shows that an additional 1,000 vehicles per day will be added to the roadway, the agreement between the County and the City could be an equal cost share between the two entities. It is understood that the jurisdictional transfer process has begun for a small part of this stretch.

Deficiencies

In general, the issues and deficiencies identified in baseline conditions analysis do not change in the future. However, understanding how things are expected to change in the future can bring some issues to the forefront that may not be a priority in the current year. In particular, traffic forecasts and potential development and growth around the Vermillion area indicate that planning for change now is important for successful outcomes in the future.

CAPACITY DEFICIENCIES

Due to development in the urban and suburban areas of Vermillion, future traffic volumes indicate that some roads may approach or exceed capacity by the year 2045. Where and when this will occur is dependent on a number of variables, but some corridors featured in Figure 22 could be due for capacity improvements such as additional lanes if the area continues to develop. These locations are all near Vermillion, and are candidates for jurisdictional transfer, now or within the planning horizon year of 2045. It is understood the jurisdictional transfer process has begun for most of these locations.

RIGHT-OF-WAY DEFICIENCIES

As with most counties in South Dakota, the typical right-of-way (ROW) width along Clay County roads is 66 feet, which dates back to the original construction of the road network. Modern design standards for modern vehicles and safety expectations of the roadside clear zones make it difficult to construct within this width, and sometimes up to 100 feet (or more) may be needed. There is cost to acquire additional ROW to widen the roadway surface and/or reshape the roadside ditches, particularly when it is adjacent to difficult terrain or fertile farmland. This may be a big hurdle to implementing a vision for the proposed road cross-sections featured in the Major Roads Plan and Base Typical Cross Section Standards (Section 5 of this report). Some rural agencies and state DOTs have begun to shift towards Performance-Based Practical Design (PBPD), which is an alternative to following rigid recommended minimum design standards by incorporating performance-based analysis to aid in the design decision process by emphasizing the project's core purpose and need. See Section 5 of this report for more information about PBPD.

OTHER DEFICIENCIES

Transit Service

Transit service in Clay County is mostly provided by Vermillion Public Transit, a demand-response system rather than fixed route. Perceptions of need for transit dependent populations and additional multimodal service alternatives involving transit based on needs will need to be monitored on an ongoing basis.

Railroad Crossings

A review of the crash history inventory (2016-2020) found two crashes at railroad junctions. Both crashes occurred at the same location in southwest Vermillion (not a Clay County road) just north of the railroad at W Broadway St and West St. One crash occurred at dark (unlit) with no injury, no collision, and other/unknown contributing circumstances. The other crash occurred during the day and was a non-incapacitating injury, but also a non-collision. Driving speed was a contributing factor for the crash and the road was documented as having ruts/holes/bumps at the time. Crashes at railroad crossings often feature random characteristics, but two crashes at the same location in a 5-year period is notable for Clay County, especially considering there were no others. It is recommended that this location be assessed for improved visibility and crossing conditions by the proper maintenance authority.

All crossings should receive intermittent improvements (system-wide) to help address the random nature of crashes at low-volume crossings such as improvements for signage, lighting, visibility, geometry, crossing control, pavement markings, pavement condition, detection and preemption, and bike/pedestrian crossings.

New Technologies

Technology is changing at a rapid pace and is likely to change the landscape of transportation planning, transportation infrastructure, and how people make travel choices in years to come. However, the rapidity of technological advances will require a flexible approach to planning and delivering transportation infrastructure and services. Clay County will need to track and consider emerging technology to meet the mobility needs of a diverse cross section of the population. Transportation trends that deserve consideration to support the evolution of the transportation network include the following:

- Real-time traveler information (transit, traffic, bike/carshare availability, parking)
- Electric vehicle (EV) charging stations
- Ridesharing transportation network companies such as Uber and/or Lyft
- Autonomous vehicles
- Connected vehicles
- Traffic management solutions
- Pedestrian activated flashing crossings

ADA Policy

As Clay County considers implementation of pedestrian-friendly infrastructure, it may consider creating new policies, design guidelines, and standards as necessary to comply with modern Americans with Disabilities Act (ADA) requirements. Additionally, Clay County should continue to monitor potential safety concerns and conflicts where pedestrian activity may be introduced to the network, and proactively address them.

Bridge Needs

Clay County is currently responsible for maintenance of 75 bridges, and bridge inspections are conducted every two years. As a result of bridge inspections, the condition of the bridges falls under one of three categories: Good, Fair, or Poor. Clay County has five bridges that are currently in Poor condition (7%) and 10 bridges that are closed (13%). Bridges in Poor condition are structurally deficient, and these bridges have short or unknown remaining service lives. Comparatively, in all of South Dakota, 25% of all county-owned bridges are in Poor condition as of 2020. Due to recent bridge closures and replacements, Clay County is far below the state average for county-owned bridges in Poor condition. See Figure 12 for more details on Existing Bridge conditions.

At current funding levels, Clay County faces a difficult challenge to maintain all bridges in a state of good repair, as bridges often deteriorate at a faster rate than they can be repaired or replaced. This is why it is imperative that Clay County continue to update its 5-Year Highway and Bridge Improvement Plan to identify and prioritize the structures for rehabilitation and replacement. This short-range planning document is a tool designed to assist the county in budgeting, planning, and incorporating the needs and concerns of the public into annual road and bridge projects.

Updating this 5-year plan every year by removing or adding projects as needed, will also maintain Clay County's eligibility to receive funding through the local Bridge Improvement Grant (BIG) program established by the SDDOT. Clay County can look to their neighboring county for proof of success in regularly updating a 5-year plan, as Union County has been awarded $1,759,000 between 2016 and 2021 for preliminary engineering and bridge rehabilitation/replacements. Figure 23[16] shows the successful bridge funding awards to other counties in the region.

Clay county has identified six bridge structures for rehabilitation or replacement in the next five years. The total project cost of these six bridges is estimated to be $3.14 million. The cost for all bridge repairs in Clay County is estimated to be at least double what is currently in the National Bridge Inventory (NBI) database made in 2014 bridge inspections,[17] though this includes the 10 bridges that are currently closed. The estimate then comes to $16.2 million, though with low confidence; there has not been a comprehensive estimate of bridge repairs in Clay County since 2014.

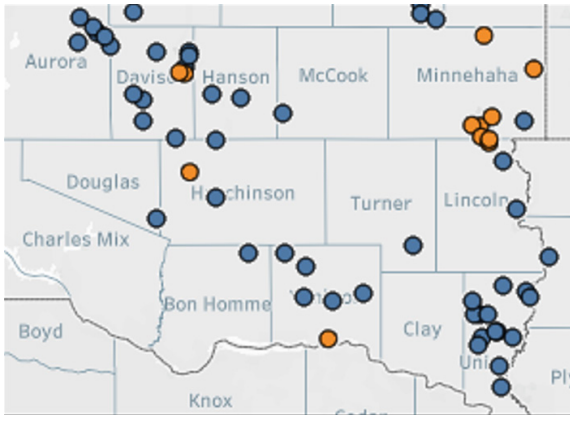


Figure 23. South Dakota Bridge Improvement Grant Project Locations (2016-2020)

16 South Dakota Department of Transportation. Bridge Improvement Grants. https://dot.sd.gov/doing-business/local-governments/bridge-improvement-grants

17 *As part of the bridge inspections in 2014, and still featured in the current NBI database, 66 bridges were assigned a bridge improvement cost, as well as a total improvement cost. The bridge improvement cost includes major structure improvements only and the total improvement cost includes all associated bridge improvement costs such as roadway improvement, right-of-way, preliminary engineering, etc. For these 66 bridges, the bridge improvement cost was estimated to be $5.0 million, and the total improvement cost was estimated to be $8.1 million. This total represents a method to estimate of the cost to repair Clay County's bridge system, though somewhat dated.*

Sustainable Community Needs

Moving forward, existing and upcoming generations will have an opportunity to consider living a car-optional lifestyle. While Clay County and the Vermillion area have largely developed around the automobile over the last 60 years, it is becoming clear that the millennial generation and other adults are placing more emphasis on how and where they live based on travel options. Having a variety of available transportation options allows people to consider reducing the number of automobiles they need. More people are likely move out of the automobile-centered lifestyle if the transportation network is seamlessly integrated and alternate transportation options are readily available, safely accessible, time competitive and provide first- and last-mile connectivity.

Transportation planning strategies for sustainability in the community include a few key themes. The first is active transportation and the allocation of spaces and corridors as part of the roadway and sidewalk network for people to walk and bike. The second is the construction of a master planned trails network throughout Clay County as laid out in this plan. Increasing the use of renewable energy is another theme emerging in transportation.

NON-MOTORIZED FACILITIES

A significant number of bicycle and pedestrian facilities are a part of this plan in Clay County; however, at the present time, there are significantly underserved areas particularly in some of the Clay County communities and along collector and minor arterial routes. This MTP lays out a phased vision for trails in Clay County to increase the amount of active transportation and recreation, while increasing Clay County's attractiveness as a place to live.

BIKE/PED SPACE TRADEOFF

As bicycle enhancements are considered, it must be acknowledged that in many instances, this priority will require prioritizing space for bicyclists over other modes. Most often in Clay County, this will result in prioritizing space for bikes over the private automobile. This could take the form of slower speeds due to narrower lanes, restricting turning movements, while other times this could mean the reduction of space for on-street parking.

In thinking about sustainability, four elements are usually discussed:

1. Leadership, civic engagement, and responsibility
2. Ecological integrity
3. Economic security
4. Social well-being

In terms of how these elements translate to the transportation network, it can be said that true leadership translates to the political will to find funding and implement the right projects without undue waste. Planning is also a form of civic engagement, and this study was supplemented with public input. The transportation system can be detrimental to the environment; however, as society moves towards the electrification of the transportation system, this could help maintain mobility while reducing impacts to air quality and the environment. Economic security is enabled by the transportation network which allows for the movement of goods and services, enabling trade and economic competitiveness. The transportation system also has profound effects on social equity and the manner in which transportation investments are made have been proven to have profound effects on community sustainability. Clay County should continue to provide support and funding for transit and paratransit as not everyone is able to drive or is capable of affording a car. Both transit and bike/ped infrastructure have positive effects on social equity. Clay County should keep the key sustainability themes outlined in this plan in mind and prioritize the construction of a trails system as trails are highly prized by residents. Communities with trails networks attract young people and employers, have higher rates of physical activity, host increased economic development, and provide a better quality of life.

5. ADDRESSING EXISTING & FUTURE NEEDS

Development of Standards and Guidelines

The following sections describe new and updated references for future planning of the Clay County road network:

Functional Classification System

Identifies recommended changes in FHWA Functional Classification Designation.

Major Roads Plan

Presents a new road classification system unique to Clay County to aid in future designs and project planning over the next 20 years.

Base Typical Cross Section and Bridge Width Standards

Presents new base typical cross section design unique to Clay County based on the Major Roads Plan classification system.

Level of Service Standards

Presents minimum standard level of service (LOS) for existing and proposed traffic operations analysis.

Access Management Access-Location Criteria

Presents access-location criteria to determine when and where proposed access is allowable on Clay County highways.

Surface Type Change Policy Guidelines

Presents standards for when Clay County highways should have surface type conversions.

Jurisdictional Transfer

Presents a review of consideration and goals for jurisdictional transfer of Clay County roads as well as a legal agreement template (Memorandum of Understanding).

Changing Maintenance Designation Guidelines

Presents guidelines and considerations for when to change a Clay County highway maintenance designation to minimum maintenance, no maintenance, or abandonment (road closure or road vacation).

FUNCTIONAL CLASSIFICATION SYSTEM

The existing Clay County roadway classification system (Figure 5) is based on the Highway Functional Classification system from the FHWA and is expected to remain the same in almost all cases in terms of classification. The SDDOT Project Development is responsible for coordinating functional classification for all roads in South Dakota. As part of this study, it is recommended to change one corridor's classification designation:

452 Ave (306 St to SD 50)

This gravel road corridor, which has been considered for permanent pavement in the past, is currently functionally classified as a local road. However, due to its reported characteristics carrying heavy vehicles, as well as a logical extension from the corridor south of SD 50 (classified as rural major collector), it is recommended to follow the SDDOT process and request a change to rural major collector.

FUTURE ARTERIALS AND COLLECTORS

In general, it is expected that the function of county road corridors will not change by 2045. The primary reasons a corridor may change in function in Clay County is due to community growth, development, or bridge closure. Therefore, there are some roads which may have future changes in functional classification:

Greenfield Rd (SD 46 to SD 50)

This paved corridor carries traffic volume of 218-362 vehicles per day. It is currently classified as a rural minor collector. Whereas University Rd (rural major collector) parallels Greenfield Rd 3 miles to the west, University Rd has three crossings over the Vermillion River that have a history of flooding, causing Greenfield Rd to become the primary north-south emergency services route east of the Vermillion River. If flooding continues to be persistent with long-term closures, then Greenfield Rd may regularly operate similar to a rural major collector.

Roads on the fringes of City of Vermillion

Any county road on the fringes of Vermillion can potentially see increased traffic as the city grows and develops. The connectivity and spacing of these county roads will most conveniently become future arterials for the City of Vermillion, as seen in the 2035 Vermillion Comprehensive Plan (2018). However, in the 2012 Vermillion Area Multimodal Transportation Plan, future arterials were purposely not identified on the fringe of developed areas. This strategy promotes the development concept of infill and contiguous development to avoid increased vehicle-miles-traveled (VMT). Instead, the 2012 plan proposed future collector roads, none of which are currently under Clay County jurisdiction. If the City of Vermillion intends to utilize Clay County roads as an arterial street to support development and growth of the City, Clay County should begin the process of jurisdictional transfer by utilizing the process recommended in Section 5.

Major Roads Plan

Using FHWA's functional classification system is not always conducive for roads design standards. For example, a road functionally classified as a collector can be paved or unpaved, carry primarily personal vehicles or heavy freight, as well as other variables not fully encompassed or primarily considered in the functional classification designation. Therefore, a Major Roads Plan unique to Clay County has been prepared to aid in future designs and project planning, incorporating pavement surfacing type, roadway width, regional connectivity, emergency service, and multi-modal accessibility as the primary considerations.

The State roads in Clay County (SD 19, SD 46, and SD 50) will remain the primary routes with the most mobility. County roads will provide the next level of mobility, providing service to towns and other regional connections that cannot be served with local roads.

THE CLAY COUNTY MAJOR ROADS PLAN FOCUSES ON COUNTY ROADS. THE FOLLOWING OBJECTIVES AND PRIORITIES WERE ESTABLISHED FOR THE CLAY COUNTY MAJOR ROADS PLAN:

1. Provide connectivity throughout Clay County to recreation, jobs, and destinations, as well as to adjacent counties (Yankton County, Turner County, Lincoln County, and Union County)
2. Maintain existing infrastructure by prioritizing the most critical roads on the county network, particularly as it relates to heavy freight
3. Support the growth of economic activity and quality of life
4. Support a multimodal transportation network through allocation of space for pedestrians, bicyclists, and transit
5. Work in tandem to support the goals of the Bicycle and Pedestrian Plan and the Trails Master Plan
6. Identify considerations for change in road jurisdiction

THE MAJOR ROADS PLAN ESTABLISHES THE FOLLOWING COUNTY ROAD CLASSIFICATIONS:

- County Paved – Priority Route
- County Paved
- County Gravel
- Local Roads
- Urban Roads

COUNTY PAVED – PRIORITY ROUTE

The most critical roads in Clay County are those that support the most regional connectivity, and therefore carry the most traffic and heaviest freight. They are paved roads that often carry over 300 vehicles per day. These roads also attract bicyclists because they connect communities and destinations. In Clay County, these roads are typically high-speed facilities. When major improvements are planned, they should strongly consider wide shoulders (6- to 8-foot) and recoverable 4:1 inslopes. Not all of the routes identified with this classification can feasibly be constructed with optimal shoulder width due to cost. If traffic volumes are less than 400 vehicles per day and relatively low compared to other routes within this classification, and the route is not optimal for bicyclists, then consideration for narrow shoulders (2-foot) may be adequate. For paved roadways with no rumble strips, no curb, and no vertical obstructions immediately adjacent to the roadway, the design of 4-foot wide paved shoulders on both sides of the road is considered the minimum width to accommodate bicycle travel,[18] and 5-foot wide if in the presence of guardrail, curb, or other roadside barriers. However, it is desirable to increase the shoulder width if motor vehicle speeds exceed 50 mph or if the route is used by heavy trucks, buses, or recreational vehicles. With the assumption that Clay County roads are 55 mph and used by heavy vehicles, 6- to 8-foot paved shoulders are recommended to accommodate bicyclists.

COUNTY PAVED

All other paved roads in Clay County support regional connectivity but are not as critical as County priority routes. They generally carry less than 300 vehicles per day but are still critical to move people and goods within Clay County. When major improvements are planned, they may have narrow shoulders (2-foot) if daily traffic volumes are less than 400 vehicles per day and should include recoverable 4:1 inslopes.

COUNTY GRAVEL

County Primary gravel roads support connectivity but may not have the same regional connectivity as paved county roads. They often carry lower traffic volumes than paved routes, which is likely why they have not been paved in the past. When major improvements are planned, they may have narrow shoulders (2-foot) if daily traffic volumes are less than400 vehicles per /day and should include recoverable 4:1 inslopes.

LOCAL ROADS

All other roads are considered Local Roads, and typically are maintained under the jurisdiction of townships or municipalities. When major improvements are planned on a rural high speed local road, they will typically have minimal shoulders (0- to 2-foot), if any, and should include recoverable 4:1 inslopes. Local Roads often have extremely limited right-of-way and major improvements are rare, so the designs may default to bare minimum lane width, shoulder width, and clear zone accommodating ditch design.

18 AASHTO. *Guide for the Development of Bicycle Facilities, 2012 4th Edition*

URBAN ROADS

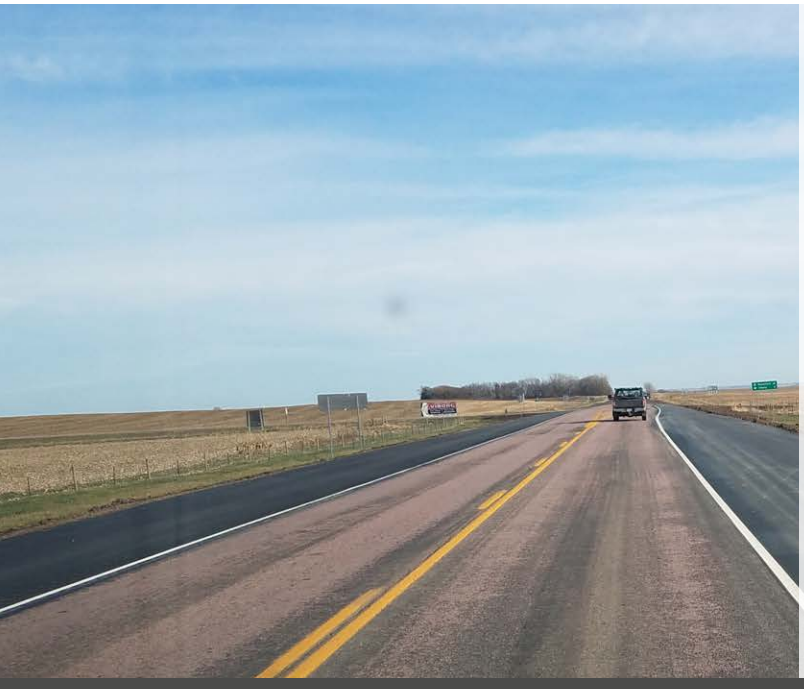
There are some roads under Clay County jurisdiction within the city limits of Vermillion. These roads already have urban cross section design according to the needs of the City. It is recommended that all of these urban roads are jurisdictionally transferred to the City of Vermillion. Section 5 has more information on jurisdictional transfer and presents candidates for jurisdictional transfer, as well as a format for future agreements. It is understood the jurisdictional transfer process has begun for most of these locations.

See Section 5 of this report for Base Typical Cross Section Standards for each Major Roads Plan classification (Urban Roads are recommended to transfer jurisdiction and do not have cross section design provided).

Paved Shoulders on Rural Highways

One of the primary differentiators between the Major Roads Plan classifications is paved shoulder width. Although the cost can be prohibitive to have paved shoulders when traffic volumes are lower, it is encouraged to the fullest extent possible when cost and right-of-way will allow. According the AASHTO (Green Book, 2018), there are numerous benefits to having paved shoulders on rural highways:

- Space for vehicles to stop due to mechanical difficulties, flat tires, or other emergencies
- Space for maintenance operations such as snow removal, mowing, and storage
- Space for evasive maneuvers for drivers (very effective for motorcyclists) to avoid potential crashes or reduce their severity
- Space for bicycle use, bus stops, occasional encroachment of vehicles, and mail delivery vehicles
- If wide enough, space for speed-change lane for vehicles turning into driveways
- Space for traffic detours during construction
- Improved sight distance in presence of cut sections and horizontal curves
- Decreased encroachment of high vegetation which can obscure wild animal crossings
- Enhanced highway aesthetics by some types of shoulders
- Encourages uniform speeds
- Lateral offset provided for signs and guardrails
- Stormwater can be discharged farther from traveled way and minimized seepage
- Structural support is given to the pavement



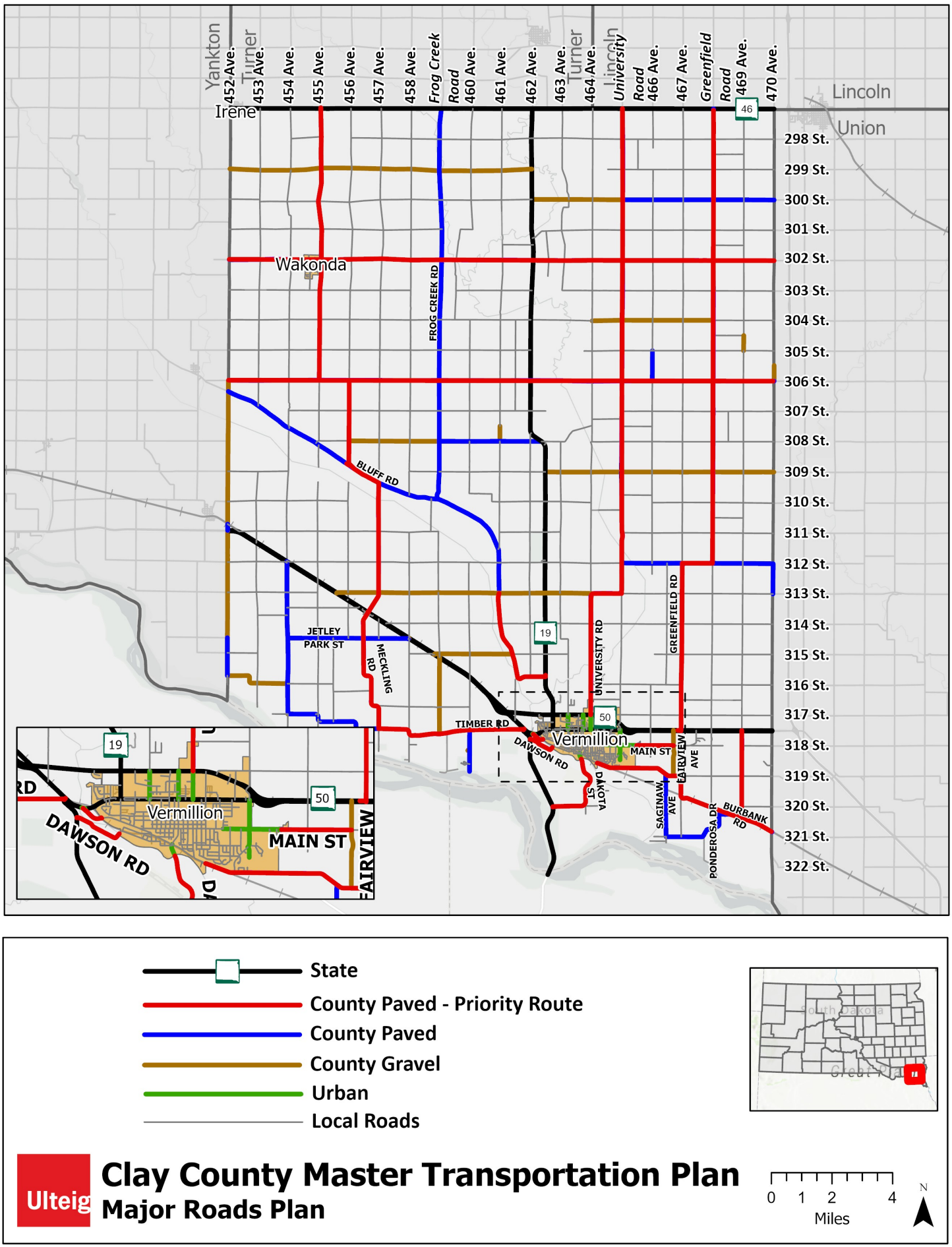


Figure 24: Major Roads Plan

Base Typical Cross Section and Bridge Width Standards

ROAD CROSS SECTION STANDARDS

The following base typical cross sections for Major Roads Plan classifications are based on the following references:

- *SDDOT Local Roads Plan (2011)*
- *SDDOT Road Design Manual*
- *A Policy on Geometric Design of Highways and Streets (AASHTO, 2004, 2011, 2017)*
- *Guide for the Development of Bicycle Facilities (AASHTO, 2012)*

The SDDOT references often source their design recommendations and standards from older editions of AASHTO, thus the multiple editions shown above. Reference documents are often updated with new editions, and the most recent edition should be sourced when designing roads. If constructing new roads or reconstructing existing roads, modern design standards and those recommended below as part of the Major Roads Plan will most likely require right-of-way of 100 feet or more, but not less than required to accommodate all elements of the designed cross section (driving lane, shoulders, slough, inslopes, ditch, backslopes, and utilities).

Twelve-foot wide roadway lanes are the standard lane width particularly for new construction, however 11-foot lanes can be considered for all roadways including truck routes as there is minimal reduction in highway capacity. Paved shoulders and rumble strips are particularly recommended for 11-foot driving lanes to decrease the likelihood of vehicles running off the roadway.

The four renderings on the following pages show the base typical section standards unique to Clay County based on the Major Roads Plan classifications.

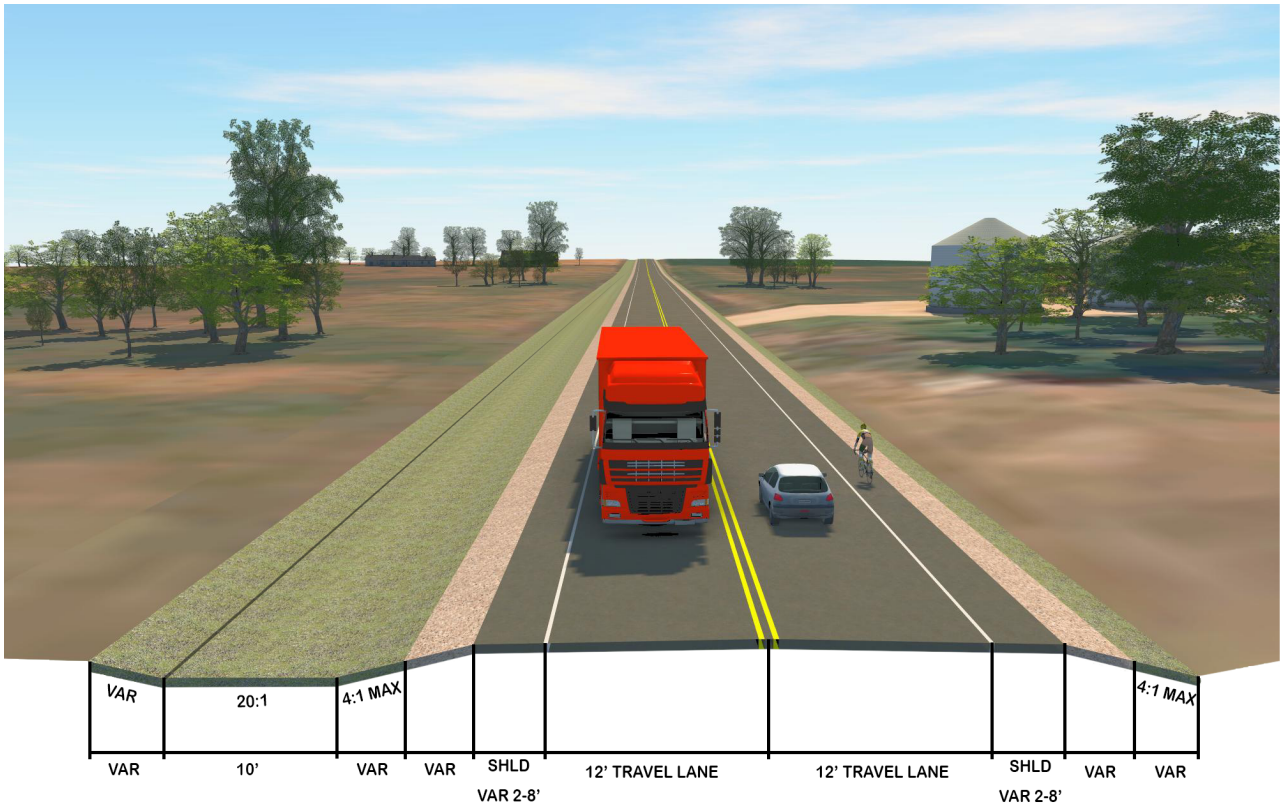
BRIDGE WIDTH STANDARDS

According to AASHTO A Policy on Geometric Design of Highways (2018), "the clear width on bridges should preferably be as wide as the approach roadway in order to give drivers a sense of openness and continuity." Poles, walkways, bridge columns, bridge railing, and parapets located close to the traveled way are potential obstructions and cause drivers to shy away from them. Additionally, they are more likely to be struck by vehicles.

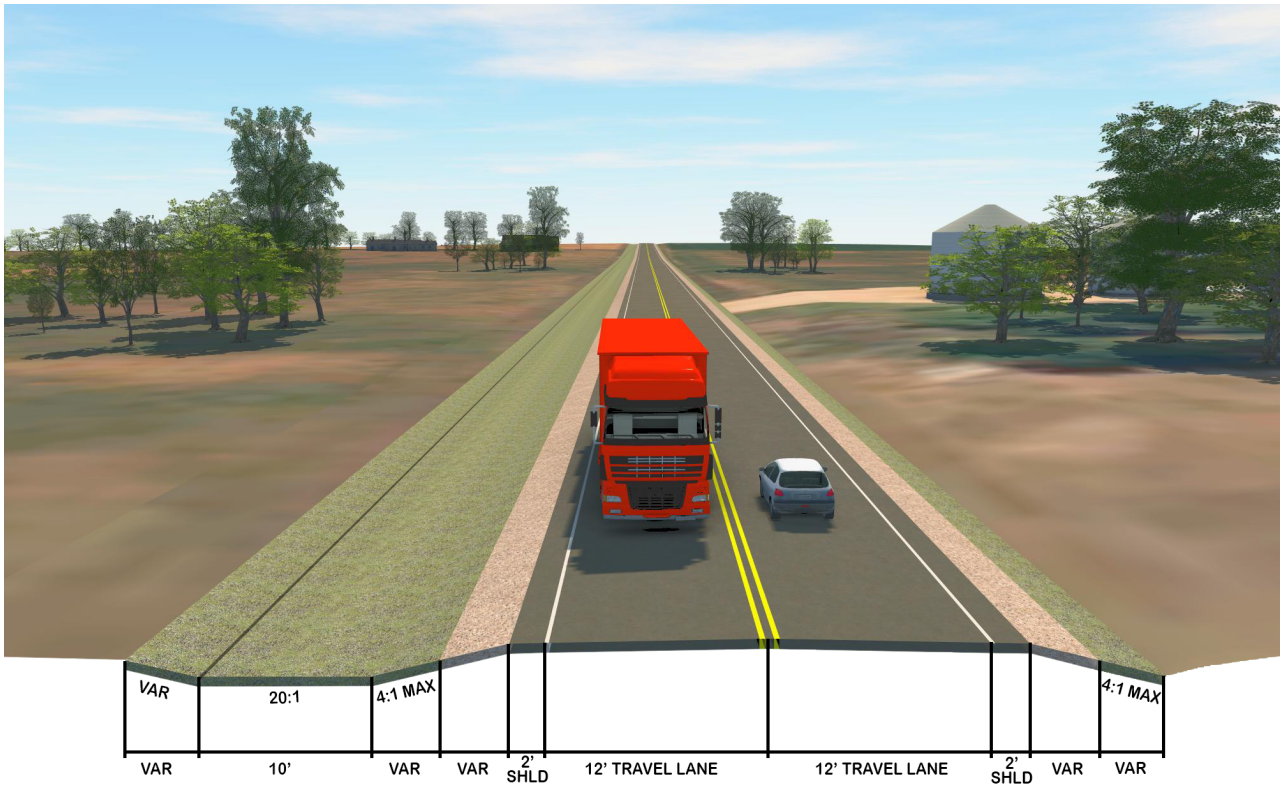
When replacing or constructing a new bridge structure, the bridge width design (minimum clear roadway width for bridges) should include the following considerations for existing and future conditions:

- According to AASHTO,[19] the minimum clear roadway width for new and reconstructed bridges depends on the design daily traffic volume and functional classification
- Approach roadway width (traveled way plus shoulder width) – shoulders should be no less than 2 feet wide and a least as wide as the approaching roadway shoulder
- Presence of paved shoulders or shared-use paths on approaching roadway
- Traffic volumes, and if there is the potential for widening the approach roadway width in the future for additional travel lanes
- Width of farm equipment using the bridge
- Safety performance of existing bridge

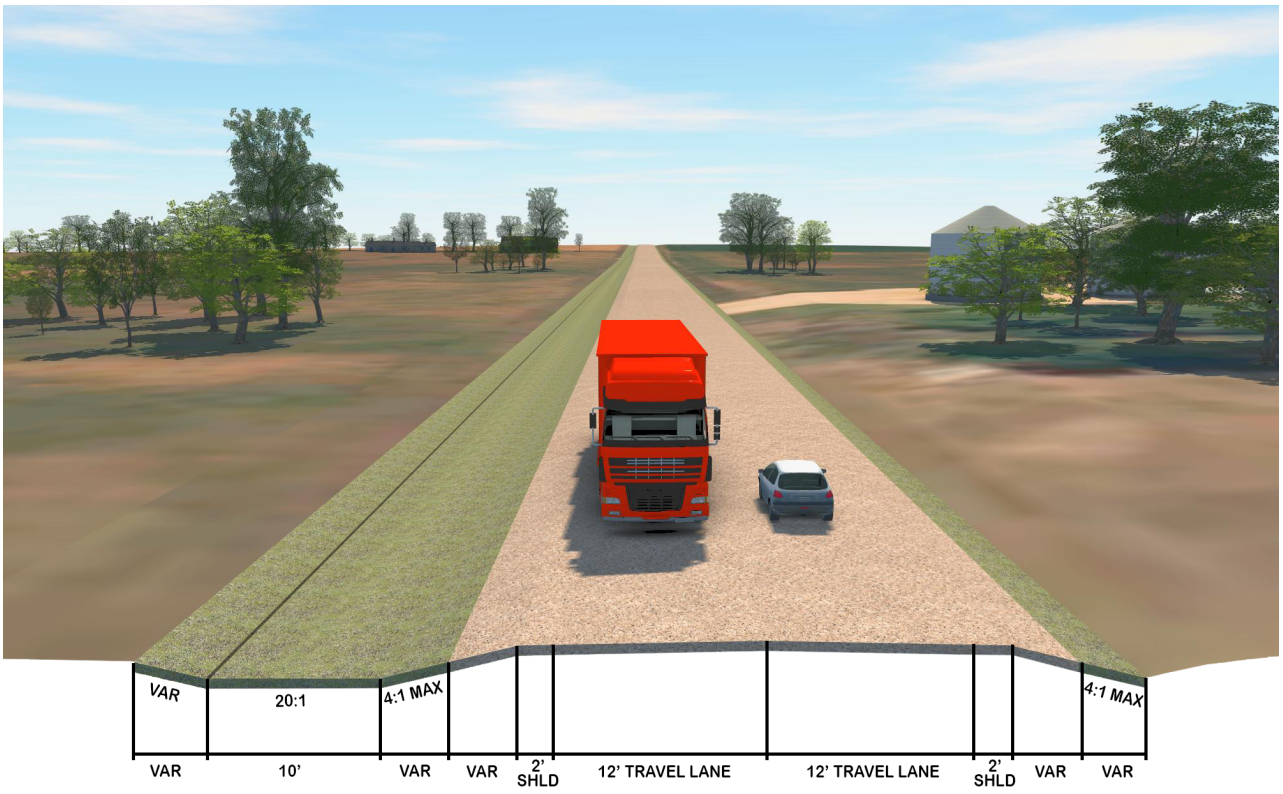
19 AASHTO. *A Policy on Geometric Design of Highways* (2018) pg. 5-9 or 6-8.



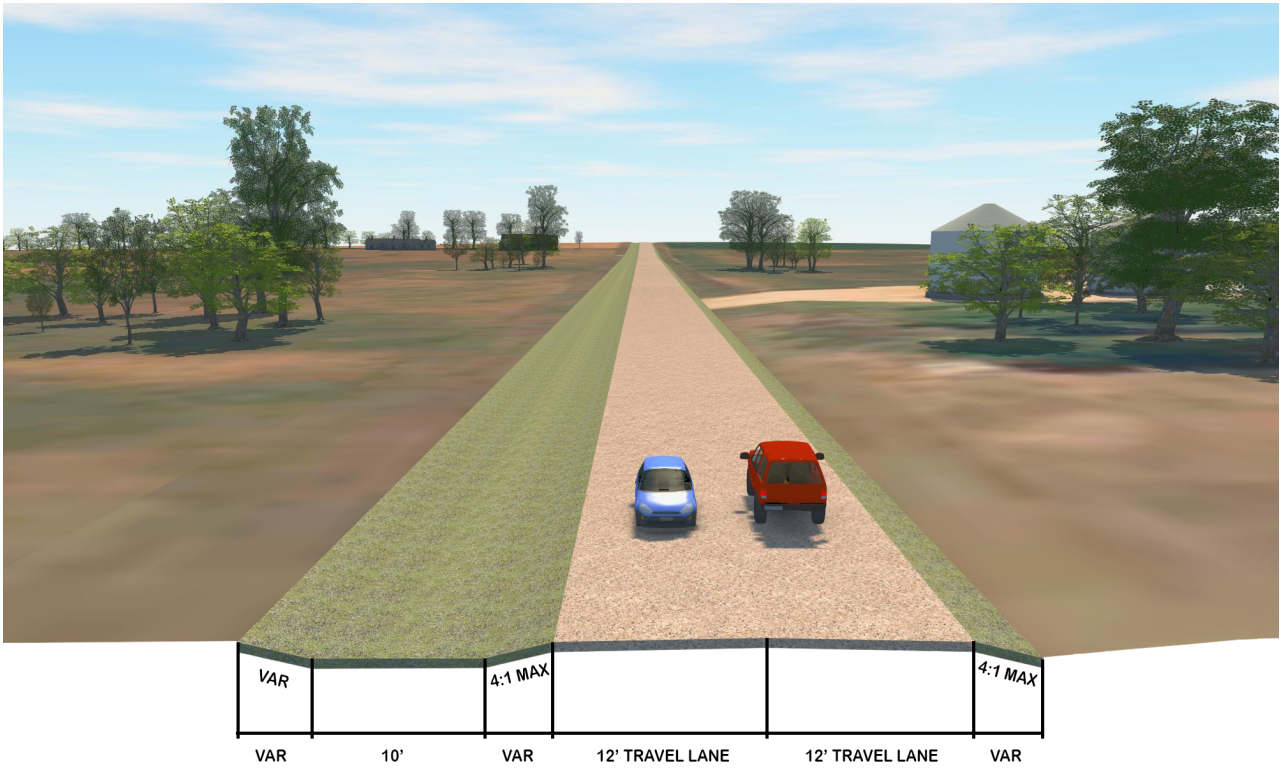
County Paved - Priority Route



County Paved



County Gravel



Local Roads

MINIMUM CLEAR ROADWAY WIDTH FOR NEW AND RECONSTRUCTED BRIDGES

The following bridge width standards for new and reconstructed bridges are derived from AASHTO recommendations and integrated with the Major Roads Plan classifications. Ranges shown depend on the approaching roadway width of the future corridor, design daily traffic volume, and functional classification. Design widths greater than the minimum ranges shown below are acceptable.

COUNTY PAVED – PRIORITY ROUTE[a]	COUNTY PAVED[b]	COUNTY GRAVEL[b]	LOCAL ROADS
Approach roadway width (32-40 feet minimum clear roadway width)	Traveled way plus 2-4 feet each side (28-32 feet minimum clear roadway width)	Traveled way plus 2-4 feet each side (28-32 feet minimum clear roadway width)	Traveled way plus 2 feet each side (28 feet minimum clear roadway width)

[a]Because County-Paved Priority Route roadways are generally desired to have wider paved shoulders in the future, all new structures are recommended to have at least 32-foot clear roadway width, even if approach roadway width is less than 32 feet.

[b]For bridges in excess of 100 feet in length, the minimum clear roadway width of traveled way plus 3 feet on each side is acceptable if approaching roadway has shoulders greater than 3 foot width.

PERFORMANCE-BASED PRACTICAL DESIGN

Some rural highway design agencies and DOTs have begun to shift towards Performance-Based Practical Design (PBPD),[20] which is an alternative to following rigid recommended minimum design standards by incorporating performance-based analysis to aid in the design decision process by emphasizing the project's core purpose and need. A major philosophy of PBPD is that implementing numerous "good" projects is more beneficial than a few "perfect" projects due to funding constraints. For example, if shoulder widths and inslope rate improvements are shown to have minimal long-term effects on safety performance (often due to low traffic volumes), then the cost to make those upgrades may not be justifiable when the funds for those improvements could be used on other safety enhancements that would have a more substantial impact on safety performance. There are many aspects of this data-driven approach to consider, and it requires the design professional to always act in accordance with the professional standard of care.

One concern with the practice of PBPD is that agencies may overemphasize short-term cost savings over long-term objectives. Currently, the SDDOT has not officially supported this practice, and has not provided a policy of its use or a toolbox to guide the decision-making process most effectively in context with South Dakota. However, with the trends of the industry, it may happen in the future. Those referring to this Clay County MTP should check to see if the SDDOT has provided any updated guidance on this topic, as it would be a valuable guide for use by county highway departments.

20 FHWA. Performance-Based Practical Design. https://www.fhwa.dot.gov/design/pbpd/

Level of Service Standards

As Clay County continues to experience growth, there will be a need to observe increased demand and preserve roadway capacity. Level of service (LOS) standards described in this section are used to evaluate existing and future performance of transportation infrastructure.

Roadway LOS changes during the day based on the traffic volume using the facility, but the value pertains to the highest travel delay experienced during the peak hours of traffic, typically during the morning and evening rush hours. Level of service is a mechanism used to quantify how well a transportation facility is operating from a traveler's perspective in terms of quality of service. There are six levels of service, and each is assigned to a letter grade from A to F: LOS A represents the best operating conditions with flowing traffic (no congestion) and LOS F the worst (severe congestion).

The most recent edition of the Highway Capacity Manual (HCM) should be used to determine LOS, and the *SDDOT Road Design Manual*[21] should be consulted in determination of traffic analysis parameters in place of default values. For general planning purposes, this study utilized the generalized tables of LOS standards found in the SDDOT's latest road design manual. The manual contains a table of minimum acceptable LOS targets for various functional classification and highway types, which is shown below.

Table 11. SDDOT Roadway Segment Level of Service Guidelines

Roadway Segments

For Construction/Reconstruction projects Table 15-8 and Table 15-9 are used as the basis for determination of capacity and basic number of lanes based on a typical 20 year average daily traffic (ADT) projection beyond the anticipated year of project construction. The highest LOS as practical, which may be higher than the values listed in Table 15-8, should be provided depending on varying conditions as noted on the following page.

Table 15-8 Level of Service Guidelines

Functional Classification[1]	Highway Type				
	Rural Level	Rural Rolling	Rural Mountainous	Urban[2]	
				Desirable	Minimum
Freeways (Interstate & Expressways, mainline, merge points, diverge points, and weave area)	B	B	C	B	C
Principal Arterial	B	B	C	C	D
Minor Arterial[3]	B	B	C	C	D
Collector[3]	C	C	D	C	D

[1] For functional classifications, refer to the current edition of the *SDDOT Functional Classification Map.*
[2] Urban includes highways within the city limits of a town or city with consideration of the growth areas beyond city boundaries. The use of level of service D should only be considered in heavily developed (fully built out) sections of metropolitan areas.
[3] Two lane Minor Arterials & Collectors should be considered Class II highways when utilizing the current edition of the *HCM.*

Source: SDDOT Road Design Manual, Chapter 15 Traffic

21 *SDDOT Road Design Manual*, Chapter 15 Traffic. https://dotfiles.sd.gov/rd/rdmch15.pdf (accessed July 2022)

For intersections, the LOS is calculated in a different manner, and lane requirements shall be determined using the methodologies of the most recent edition of the HCM. For signalized intersections, the desired overall intersection is LOS C; a minimum LOS D may be appropriate for urbanized areas. Additionally, each approach to the intersection should be designed to have the highest LOS practical.

Table 12. LOS Criteria for Intersections

Unsignalized Intersection		Signalized Intersection	
Control Delay (sec/veh)	**LOS**	**Control Delay (sec/veh)**	**LOS**
0-10	**A**	0-10	A
>10-15	**B**	>10-20	B
>15-25	**C**	>20-35	C
>25-35	**D**	>35-55	D
>35-50	**E**	>55-80	E
>50	**F**	>80	F

Source: Highway Capacity Manual 6th Ed.

In most instances, traffic analysis in Clay County will be for either rural two-lane highways or intersections. Most jurisdictions in the Clay County region try to maintain LOS B for the rural roadway system and LOS C for urban highways and intersection operations. For traffic operations analysis or traffic impact studies on Clay County roads, the recommended minimum acceptable LOS for existing or future conditions is LOS B for rural two-lane highways and LOS C for urban two-lane highways and intersections. These selected level of service standards are consistent with the SDDOT's Road Design Manual. A minimum acceptable LOS B provides a standard that considers smaller delays, driver expectations, and traffic operations that is typical for rural areas. Corridors and intersections operating at LOS C are roadways where drivers can generally travel in free-flow conditions with delays mostly experienced during peak hours. As congestion reaches higher levels at specific corridors or intersections, LOS standards may be relaxed at certain locations due to the limitation of physical constraints such as land uses, topographical constraints, and other external factors. Rural level of service often depends on being able to pass slow moving vehicles such as RVs, trucks, or vehicles towing trailers.

Traffic analysis should also consider multimodal analysis, as the most recent edition of the *Highway Capacity Manual* provides methods to assess bicycle and pedestrian LOS.

Access Management Standards

It is important to mention that the highest practical LOS may be higher than the values listed in the table (for example, LOS A is better than LOS B and thus meets all minimal acceptable LOS targets).

According to FHWA, access management is the proactive management of vehicular access points to land parcels adjacent to all manner of roadways. Good access management promotes safe and efficient use of the transportation network. It encompasses a set of techniques that state and local governments can use to control access to highways, major arterials, and other roadways. These techniques include access spacing, driveway spacing, safe turning lanes, median treatments, and right-of-way management. Figure 25[22] shows the relationship of functional classification to access and mobility.

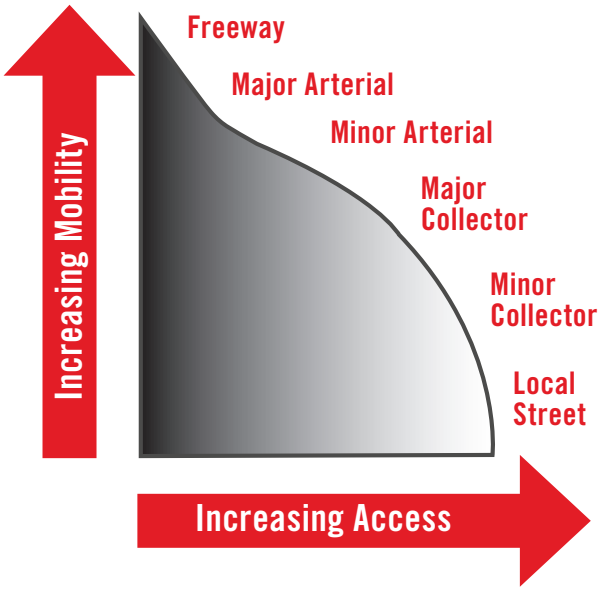


Figure 25. Access Mobility and Functional Classification Relationship (FHWA)

ACCESS MANAGEMENT ACCESS-LOCATION CRITERIA

Clay County does not currently have an access management policy or ordinance in place (sometimes referred to as a driveway ordinance). If a property along a county road proposes to add an access or driveway, the property owner is directed to work with the Clay County Highway Department to obtain a permit at a cost of $75.00 and complete an application for entrance from a Clay County highway. The permit also needs approval from the Clay County Commission with application for occupancy on the right of way of county highways. Costs to install the access are at the owner's expense and must follow the Clay County Highway Department specifications, which specify width of access, culvert type, culvert slope, inslope rate, fill type, and surfacing type.

Clay County has permit authority on development and road infrastructure improvements but does not formally regulate access-location criteria with an access management policy or ordinance. It is recommended that Clay County create such a policy or ordinance that follows such criteria in order to promote the public safety, esthetic values, and engineering integrity of its roads. Especially in the growth areas around the Vermillion area, Clay County should strive to maintain the mobility function of county highways as expected (specifically high speed rural corridors with limited access points). Developers should be guided to manage circulation patterns within internal roadways instead of becoming reliant on county highways for numerous and crowded access points. When ready, Clay County should transfer jurisdiction to growing municipalities for urban cross section development.

22 Figure 25. Federal Highway Administration. Access Management. https://ops.fhwa.dot.gov/access_mgmt/what_is_accsmgmt.htm

Depending on how the proposed access will be used, the impacts can vary greatly. On one end of the spectrum, a major development will generate high numbers of trips, requiring physical improvements to the access point itself as well as nearby intersections. On the other end of the spectrum, a field approach to a field will generate a minimal number of trips. However, in all cases, the conditions have changed, and a new conflict point to the highway has been introduced. The more significant the change, the more complex the evaluation will be. Therefore, Clay County should also provide thresholds within the access management policy that trigger traffic impact study requirements, the primary means of evaluating the impact of new developments on the county road system.

By developing access management standards, Clay County would strive to achieve a balance between property access and functional integrity of the road system. Studies show that implementing access management provides three major benefits to the transportation systems:

- Increased roadway capacity
- Reduced crashes
- Shortened travel time for motorists

These three benefits are essentially the result of minimizing or managing the number of conflict points that exist along a corridor. When conflict points are introduced by means of a new driveway or intersection, the mainline flow must adjust speeds and sometimes lanes to avoid all manner of delay and conflicts introduced such as slowing, turning, merging, entering, and stopping.

The SDDOT created administrative rules governing access to state highways.[23] The SDDOT Road Design Manual also provides guidance,[24] including corner clearance between crossroad intersections and driveways, stopping sight distance, and others. Some counties in South Dakota have followed similar rules in development of their own access management policy. As part of this study, recommended standards for access management are shown in Table 13. The classifications and access-location criteria displayed should be used to determine whether or not a proposed access is allowable, and if allowed, the location of the access. These standards would integrate well with a formal access management policy or ordinance.

23 South Dakota Administrative Rules. Chapter 70:09:02 Access-Location Criteria. https://sdlegislature.gov/Rules/Administrative/26298

24 SDDOT Road Design Manual, Chapter 17 Access Management. https://dotfiles.sd.gov/rd/rdmch17.pdf (accessed July 2022)

Table 13. Clay County Access-Location Criteria

Major Roads Plan Classification	Access Class	Signal Spacing Distance (miles)	Median Opening Spacing (miles)	Minimum Unsignalized Access Spacing (feet)	Access Density (accesses / side / mile)	Denial of Direct Access When Other Available
County Paved - Priority Route	Urban Fringe/ Rural	1/4	1/2 F, 1/4 D	1000	5	Yes
County Paved	**Urban Fringe/Rural**	1/4	1/2 F, 1/4 D	1000	5	Yes
County Gravel	**Rural**	N/A	N/A	1000	5	Yes

Notes:

1. The County Highway Superintendent shall determine the access classification.
2. N/A = Not Applicable, F = Full Movement – all turns and through movements provided, D = Directional Only – certain turning and through movements not provided.
3. Clay County may defer to local criteria on any highway facility located within or adjacent to the local jurisdiction if the access-location criteria are more stringent.
4. Clay County will seek opportunities to reduce access density wherever possible.
5. County Gravel (rural class) minimum unsignalized access spacing may be reduced to 660 feet by the County Highway Superintendent, based on the results of an engineering study; however, preferred minimum spacing is 1000 feet. An engineering study of sight distance, corner clearance, operational efficiency, safety, and adjacent land use may also be conducted by the County prior to granting access and may alter the criteria shown in the table.
6. The County Highway Superintendent may grant variance from the access-location criteria. No variance may be considered until other feasible options for meeting access-location criteria are explored. Any applicant for a variance from these criteria shall provide three elements of proof of unique or special conditions that make strict application of the provisions impractical.
   a. Reasonably convenient access cannot otherwise be obtained;
   b. No feasible engineering or construction solutions can be applied to mitigate the condition; and
   c. No alternative access is available from a street other than the primary roadway.

No variance may be granted, unless strict application of access-location criteria would deny reasonably convenient access or would endanger public health, welfare, and safety. A variance from local access-location criteria must be granted by the local jurisdiction prior to the County's consideration of the variance if the County has deferred to more stringent local criteria.

Access Class Definitions:

Urban Fringe – rural highway serving developing area immediately adjacent to a city or town. Access regulated to provide future through-traffic priority.

Rural – low volume, high-speed facility. Access points are spaced for safety and operations efficiency.

To help streamline the access permit application process, the Clay County Commission could designate approval authority to the County Highway Superintendent. If the proposed access does not meet the minimum acceptable access-location criteria, variance from the access-location criteria may be granted based on the results of an engineering study or proof of unique or special conditions that make strict application of the provisions impractical. In such a case, proof must be provided that (1) reasonably convenient access cannot otherwise be obtained, (2) no feasible engineering or construction solutions can be applied to mitigate the condition, and (3) no alternative access is available from a street other than the primary roadway.

Further, in order to protect public health, safety, and welfare, the County may alter the minimum acceptable access-location criteria, defer to more stringent access-location criteria if the County Highway facility is located within a local jurisdiction, and/or attach reasonable and prudent stipulations as a condition of application approval. Considerations include engineering studies of sight distance, corner clearance, safety, operational efficiency, adjacent land use, coordinated access planning, integrity of road system, applicable design standards, etc. For applicants aggrieved by a decision of the County on an access permit application, and appeals process to the Board of County Commissioners within a confined period of time is typical.

Jurisdictional Transfer

There are multiple ways a matter of jurisdictional transfer of public right-of-way can present itself (development projects, future capacity concerns, maintenance-related funding restrictions, system continuity, very high or very low traffic volumes, special agreements, etc.). It is recommended to begin conversations with other agencies as early in the process as possible. If it is determined that a jurisdictional transfer is necessary, the following steps should be followed.

The first step is to establish clear boundaries on the limits of the transfer. It is recommended that a professional licensed surveyor is used to create a figure that shows the precise area that will be part of the agreement. Once the area is agreed upon by all parties, a public notice of the proposed jurisdictional transfer should be sent out to all adjacent landowners. After all public comments are addressed, the penultimate step is to prepare a legal agreement between all entities. The agreement should include the following items (in addition to other standard legal language):

- Purpose of the jurisdictional transfer
- Public notice timeline, and state that all public comments of adjacent landowners have been sufficiently addressed
- Clearly state that by signing this agreement, the entities agree to transfer ownership, maintenance, and other responsibilities associated with the land.
- Survey plans showing the area of jurisdictional transfer stamped by a Professional Land Surveyor

CANDIDATES FOR JURISDICTIONAL TRANSFER

Within Vermillion City Limits*

- Main St (Anderson St to 5,140 feet east)
- Crawford Rd (SD 50 L/Cherry St to Pinehurst Ave)
- Pinehurst Ave (Crawford Rd to 970 feet south)
- Princeton St (SD 50 to SD 50 L/ Cherry St)
- Dakota St (SD 50 to SD 50 L/ Cherry St)
- Dakota St (Chestnut St to bridge 810 feet south)
- University St (SD 50 to SD 50 L/ Cherry St)

** Route currently in process of being transferred to City of Vermillion*

Adjacent to Vermillion City Limits

- Burbank Rd (western boundary to 3,975 feet east of Crawford Rd)
- University Rd (Coyote St to SD 50)

Discontinuity of System and/or Potential for Development

- Main St (SD 19 to 2,170 feet east)
- Dawson Rd (SD 19 to 4,550 feet east)
- Dakota St (Chestnut St to SD 19)
- 304 St (464 Ave to University Rd)
- 461 Ave (308 St to 2,640 feet north)
- 466 Ave (305 St to 306 St, paved road to Dalesburg Baptist Church)
- 469 Ave (Newdale St to 305 St)
- 470 Ave (306 St to 2,640 feet north, road to unincorporated community of Alsen)
- 454 Ave (Timber Rd to Myron Grove River Access to Missouri River, currently a township road)

The final step is to take the final agreement to the governing bodies for final signatures. There should be a signature block in the agreement for the chairman of the Clay County Board of Commissioners, the mayor (or other similar title) of the municipality, and, if pertinent, any relative entity from the South Dakota Department of Transportation. These signature blocks are flexible and should change based on the context of the jurisdictional transfer. See Appendix E for a legal agreement template, which is presented as an option to guide the jurisdictional transfer process by a Memorandum of Understanding (MOU).

A brief review of Clay County and discussion with the SAT showed that there are some county road corridors that appear to be candidates for jurisdictional transfer, now or within the planning horizon year of 2045. These candidates were identified as outliers to the county road network of continuity or near city development areas, however, further study and discussion is warranted. The jurisdictional records in the database indicated 3.6 miles of Clay County roads within the boundaries of the City of Vermillion. It is unclear from the County's perspective if these roads have formally been transferred to the City or not. It is recommended that any unofficial or informal agreements between Vermillion and Clay County be formally recorded and documented using the MOU provided. It is understood the jurisdictional transfer process has begun for most of these locations.

Alternatively, jurisdictional transfer can occur by bringing roads into county jurisdiction from other agencies. Clay County indicated that 454 Ave (from Timber Rd to the Myron Grove River Access to the Missouri River) is a candidate for jurisdictional transfer.

Changing Maintenance Designations Guidelines

It does not appear that there are any roadways under Clay County jurisdiction that are formally proposed to be changed to minimum maintenance, no maintenance, or abandonment (road closure or road vacation). However, these are options for the County to consider when roadways frequently flood, a bridge cannot be replaced, or other reasons. Clay County may pursue resolutions that change road maintenance designation. This ultimately decreases connectivity of the network but may be preferrable to excessive cost and safety concerns. The primary considerations are daily traffic volume, detour length, road classification, acceptable alternative route, and overall cost benefits. See Section 5 for more information on flooding mitigation and flood prone areas on the Clay County road network. See Section 6 for more information on the Bridge Replacement Plan.

Procedures for these resolutions must follow applicable state laws.

JOINT JURISDICTION

Clay County shares joint jurisdiction with the City of Vermillion in a "transition area" surrounding Vermillion. As described in the Clay County Comprehensive Plan (Draft), counties and cities can work together for joint benefits, but *"the granting of joint jurisdictional power is at the county commission's discretion and is not a right of the municipality."* The comprehensive plan has more details regarding the guiding policies of transition areas and procedural requirements for joint zoning and jurisdiction.

Road Maintenance

The pavement condition in Clay County is believed to be fair-to-good overall, though a pavement condition assessment has not been made formally. This conclusion is drawn from the results of the public survey. For gravel county roads, 57% of respondents rated fair and 25% rated good. For paved county roads, 37% rated fair and 42% rated good. 30% of respondents said Clay County infrastructure quality is somewhat better or better than five years ago, while 16% said somewhat worse or worse. With more respondents saying the quality is better than worse compared to five years ago, this study does not make major changes to the current county maintenance strategy. The following strategies are described according to SDDOT's Pavement Preservation Guidelines.[25]

ROAD PREVENTIVE MAINTENANCE

Preventive maintenance projects use the philosophy of applying "the right treatment, to the right pavement, at the right time." Clay County's current maintenance strategy typically consists of applying chip seal maintenance projects. Chip seals are popular in South Dakota because they have good return on investments by extending the service life of pavement without high costs. However, their effectiveness is greatly reduced as overall pavement condition deteriorates because it does not replace or add strength to the pavement. It was communicated by the highway department that Clay County had previously applied chip seals on roughly a 5-year cycle, but the cycle now varies substantially with the introduction of microsurfacing rehabs and flooded road damage.

ROAD REHABILITATION

Rehabilitation projects range from non-structural to structural enhancement. The County's current rehabilitation strategy typically consists of applying asphalt overlay projects with either a leveling course or a milling operation. Applications are applied as needed for each road. Clay County has implemented other rehab projects and recently has preferred microsurfacing, which is a non-structural rehab that is effective at sealing the pavement surface and correcting minor surface irregularities with a new thin layer of material. In 2021, Clay County applied 30 miles of microsurfacing, which is approximately 16% of the paved roads. For planning purposes, road rehabs are generally assumed to be asphalt overlays. Rehab projects are typically Clay County's most expensive roadway surface improvements, so it is essential that these project types are planned for best return on investment. That return can be due to longevity of the road service life gained or supporting economy and quality of life of the most users.

ROAD RECONSTRUCTION

Due to the high cost of reconstruction, it is typically avoided if possible and may not be affordable when it is necessary. Reconstruction of one road can use up most of the annual funding budget. If reconstruction is expected in the future for any county road for any reason, it should be planned years in advance so that funding can raised, planned, and applied.

25 SDDOT. *Pavement Preservation Guidelines* (March 2021).

SPRING LOAD RESTRICTIONS

The literal prevention of loading by imposing load limits is a great way to maintain existing road infrastructure, though it must be weighed against the barrier it places on economies of industries that use heavy equipment. With that consideration, South Dakota laws are comparatively lenient on the size of farm and trucking equipment. Because springtime is the most vulnerable time for roads, the SDDOT and Clay County implement Spring load limits. In 2022, Clay County load limits were 6 tons/axle for paved roads with the exception of Bluff Rd from SD 19 to 313 St. Gravel roads were 7 tons/axle, or as posted. All roads could not exceed 80,000-lbs gross vehicle weight (GVW). The period of time that these load limits may be in place can be from February 15 to April 30. These load restrictions protect highways during the spring thaw, which is when roads are most susceptible to damage from heavy loads. During Spring, the frozen ground thaws from the top down, and there is a period of time where moisture laden pavement and base material is caught between the heavy loads above it and frozen subgrade beneath it. By protecting the highways during this time, the County is protecting its largest assets and investments.

STRIPING AND PAINTING

Another issue facing Clay County is the nationwide resin shortage that impacts road paint availability. Centerlines and edge lines often are applied later than typical. This impacts road safety as drivers may have trouble following the driving lane, particularly at night. If the shortage continues to impact Clay County and knowing that alternative options for improvement are limited, striping should be prioritized for roads with high traffic volumes, narrow driving surfaces, and presence of curves in the roadway geometry.

Surface Type Change Policy Guidelines

In early discussions, Clay County indicated they do not intend to convert any paved roads to gravel. On the other hand, Clay County occasionally considers the idea of converting a gravel road to a paved road. What follows is policy guidelines for the conversion of an unpaved road to a paved road in Clay County.

When traffic volumes and maintenance costs increase, the question of when to pave an unpaved road often arises. There are numerous factors to consider, though traffic volume and cost are important factors. The *Gravel Roads Construction & Maintenance Guide*,[26] produced in part by the South Dakota Local Technical Assistance Program (SDLTAP), has a 10-part framework to answer the question. Careful consideration of all 10 points will help assure decision-makers that the right decision is being made. The guide says that serious consideration for paving a road should occur when traffic volumes exceed 400 vehicles per day, but it may be justified at lower volumes if the public favors paving the road and the route serves a popular recreational site or a destination that is economically important to Clay County. At that point, the County should conduct an engineering study and preliminary design to evaluate feasibility and cost of paving the road, even if the traffic volumes are less than 400 vehicles per day. The engineering study should include, at a minimum, traffic and truck volumes, evaluation of purpose and need to determine if paving the road meets the goals of Clay County, and a comparison of short and long term costs. If justified by the County, then the County can proceed to final design, funding, and construction

26 FHWA and South Dakota Local Technical Assistance Program (SDLTAP). *Gravel Roads Construction & Maintenance Guide (August 2015). Appendix D: When to Pave a Gravel Road.*

Bridge Maintenance

[27]John Butt, Ulteig's Associate Director, Civil, authored the following article about bridge maintenance.

The best way to get more life out of bridges is to invest in an ounce of prevention in the short term to avoid the expense of a much more costly cure in the long term. Listed below are some strategies for squeezing more life out of existing bridges:

Set up a Prioritization System

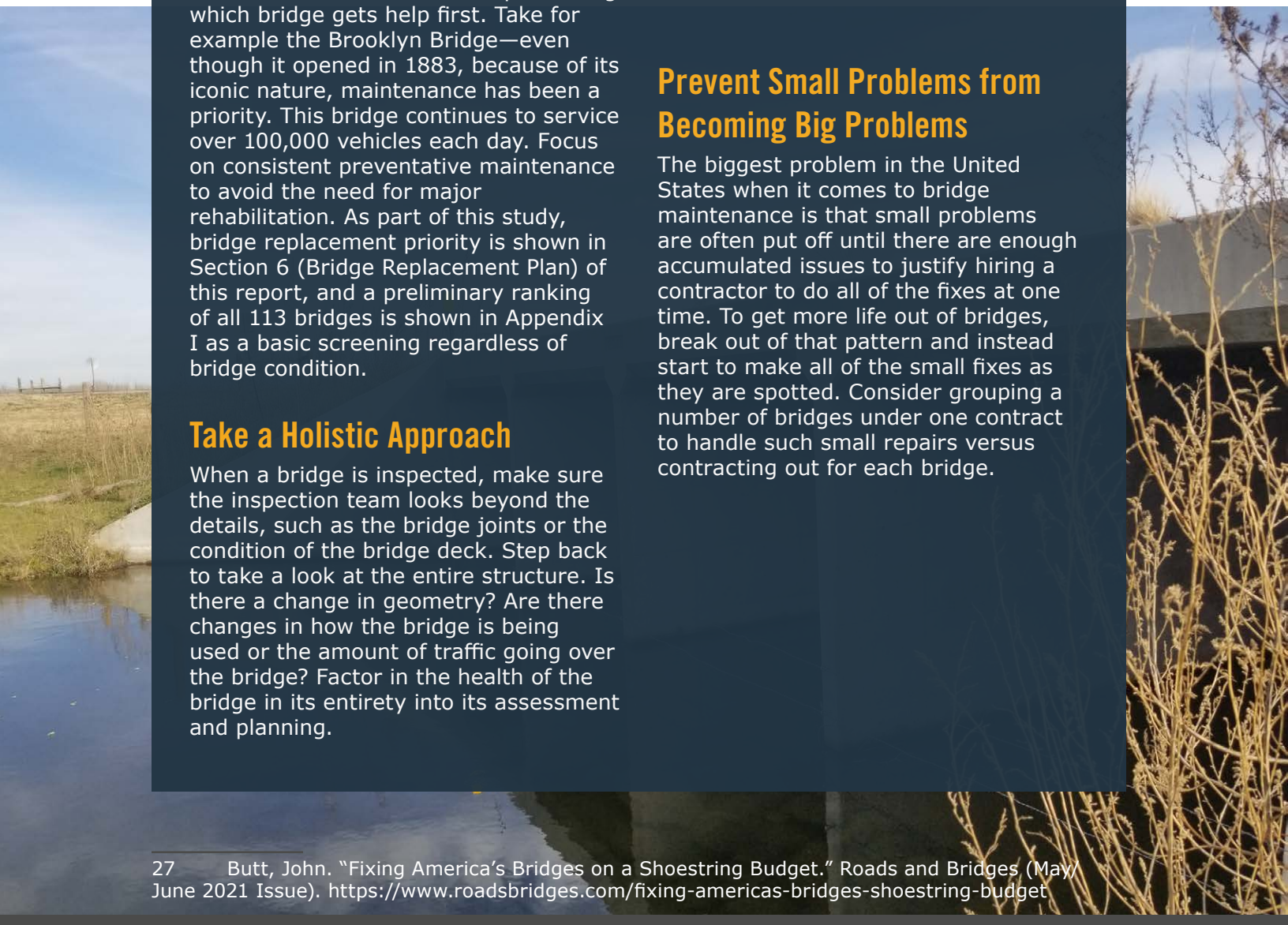
No two bridges are alike. Age alone is not the number one factor in prioritizing which bridge gets help first. Take for example the Brooklyn Bridge—even though it opened in 1883, because of its iconic nature, maintenance has been a priority. This bridge continues to service over 100,000 vehicles each day. Focus on consistent preventative maintenance to avoid the need for major rehabilitation. As part of this study, bridge replacement priority is shown in Section 6 (Bridge Replacement Plan) of this report, and a preliminary ranking of all 113 bridges is shown in Appendix I as a basic screening regardless of bridge condition.

Take a Holistic Approach

When a bridge is inspected, make sure the inspection team looks beyond the details, such as the bridge joints or the condition of the bridge deck. Step back to take a look at the entire structure. Is there a change in geometry? Are there changes in how the bridge is being used or the amount of traffic going over the bridge? Factor in the health of the bridge in its entirety into its assessment and planning.

Prevent Small Problems from Becoming Big Problems

The biggest problem in the United States when it comes to bridge maintenance is that small problems are often put off until there are enough accumulated issues to justify hiring a contractor to do all of the fixes at one time. To get more life out of bridges, break out of that pattern and instead start to make all of the small fixes as they are spotted. Consider grouping a number of bridges under one contract to handle such small repairs versus contracting out for each bridge.



27 Butt, John. "Fixing America's Bridges on a Shoestring Budget." Roads and Bridges (May/June 2021 Issue). https://www.roadsbridges.com/fixing-americas-bridges-shoestring-budget

Focus on Bridge Joints

The bridge joint is the interface between the road and the bridge, and it should be at the top of the list for preventative maintenance. Many older bridges incorporated a strip seal of some form to waterproof the joint. Some bridges lack this joint sealant all together, creating an opening for moisture and debris to accumulate on the bearing seat. Installing and maintaining the joint seal is a low-cost way of avoiding bigger problems in the future and a good way to extend the life of the bridge. Watch for tearing in the seal and make sure to regularly clear objects that could tear into the seal, such as bolts, screws, nails, wood, and even discarded coffee cups and litter. Pay special attention to bridges in high traffic areas where it is more likely road debris will get into the joint.

Replace or Eliminate the Joints

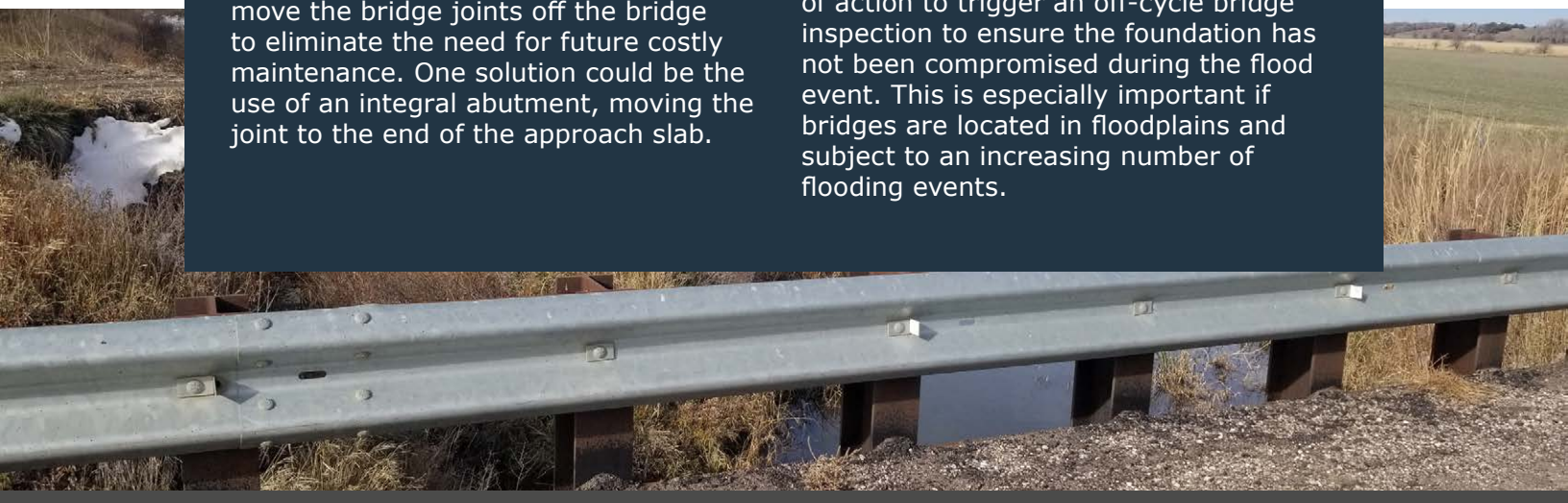
At some point, through a combination of wear and tear along with routine aging, you will need to completely replace the seal. As much as possible, replace joints before they have completely failed to protect the superstructure and substructure below. When it comes to replacements or major rehabilitations, move the bridge joints off the bridge to eliminate the need for future costly maintenance. One solution could be the use of an integral abutment, moving the joint to the end of the approach slab.

Increase Road Sweeping Frequency

One of the lowest cost, most effective things to maintain bridge life is to regularly use a road sweeper to clean off bridges. Removing dirt, sand, rocks, road salt, and objects such as nails, screws, glass, and other items prevent ponding of water that could damage bridge joints. Water is the number one enemy of bridges and allowing it to flow as intended will improve the structure's service life. Instead of once a year, consider doubling or tripling your bridge cleaning efforts. It is a relatively low-cost method to achieve high return on service life.

Install Remote Water Gauges

One of the most common causes of catastrophic bridge failures is scour, where water removes the soil supporting a bridge's foundation. Typically, this is a known issue well in advance of the failure, as identified in biennial inspection reports. Consider installing remotely monitored gauges to measure water levels and water flow, which will give an indication of when bridges are experiencing higher flow events. This can be used as a part of a scour plan of action to trigger an off-cycle bridge inspection to ensure the foundation has not been compromised during the flood event. This is especially important if bridges are located in floodplains and subject to an increasing number of flooding events.



Get Away from Deicing Salts

Salt-based deicing chemicals are highly effective at melting ice, but they are also highly corrosive to steel and leach through concrete, accelerating the deterioration of the bridge superstructure. Consider switching to sand as a friction aid instead of using salt to melt the ice; it is more environmentally friendly and still effective.

Avoid Adding Excessive Dead Load

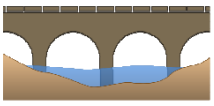
Excessive amounts of asphalt impose a dead load on the bridge, which will negatively impact the bridges load rating. Consider milling the asphalt surface prior to placing an overlay in locations where the additional dead load would be detrimental to the load rating. Thin overlays in place of more traditional lift thicknesses are also an option. The buildup of gravel on bridges along gravel roads should also be avoided. Instead, match the bridge deck as closely as possible.

Image of Gravel to Bridge Transition

Source: FHWA. Gravel Roads Construction & Maintenance Guide, August 2015

BRIDGE IMPROVEMENT GRANT (BIG) PROGRAM

The Bridge Improvement Grant (BIG) program was created in 2015 by the South Dakota Legislature, which helps counties fund bridge improvements by distributing $15 million annually. It stated that for eligibility for a BIG grant, a county must impose a wheel tax and implement a County Highway and Bridge Improvement Plan detailing proposed highway and bridge projects over the next 5 years. Clay County formally submitted the Clay County 5-Year Plan 2023-2027 in the Fall of 2022, and it was accepted by SDDOT. This is Clay County's first county highway and bridge improvement plan, and it is the first time Clay County has become eligible for BIG grants!



DEPARTMENT OF TRANSPORTATION

BRIDGE IMPROVEMENT GRANT FACT SHEET

WHAT

The Department of Transportation (DOT) Bridge Improvement Grant (BIG) is a means for local governments to analyze, preserve, rehabilitate, and reconstruct bridges on their local roads.

- 3 grant types:
  - Preliminary Engineering
  - Preservation
  - Rehabilitation/Replacement
- Requires a 20% local match to the grant amount awarded to the project.
- The local agency is responsible for all right-of-way acquisitions, utility costs, final surfacing, and fencing costs.

WHO

Counties that have implemented a wheel tax and have an approved Five-Year County Highway and Bridge Improvement Plan Guide on file with the DOT, and municipalities who own and maintain bridges. Applications are ranked by bridge condition, local planning, user impact, and local financial commitments.

WHEN

Preliminary Engineering grant application notices are made available each spring with applications due to the DOT by August 1. The Transportation Commission will act on these grant recommendations received from the DOT, by the end of October.

Preservation and Rehabilitation/Replacement grant application notices are made available each fall with applications due to the DOT by January 2. The Transportation Commission will act on these grant recommendations received from the DOT, by the end of April.

APPLICATIONS

Applications are available through the DOT Office of Local Government Assistance. For a copy of the BIG Procedures and application form, call (605) 773-2995, or check out our website at: https://dot.sd.gov/doing-business/local-governments/bridge-improvement-grants

WHEEL TAX

Implementing a wheel tax in Clay County puts the County in position to apply for the SDDOT's BIG program. It is strongly recommended that Clay County apply for BIG funds each year if there is possible awarding of bridge funds for any improvement category.

As of 2022, Clay County imposes a wheel tax of $4.00 per wheel on all motor vehicles registered in Clay County, with a maximum of $16.00 per vehicle. This Wheel Tax earns Clay County 8 points in terms of the SDDOT BIG application. Potentially, an increase to the maximum of $5.00 per wheel could earn Clay County 10 points towards BIG applications, which would be one strategy to increase revenue for transportation improvements.

In comparison to all adjacent counties, Clay County has the lowest per vehicle wheel tax in the area and should consider raising the maximum wheel tax per vehicle to increase revenue for transportation improvements. Union County imposes a $4.00 wheel tax per wheel with a $48.00 maximum. Yankton County imposes a $5.00 wheel tax per wheel with a $20.00 maximum per vehicle. Both Turner County and Lincoln County impose a $5.00 wheel tax per wheel with a $60.00 maximum.

Source:

https://dot.sd.gov/doing-business/local-governments/bridge-improvement-grants

Special Events

If scheduled special events are to take place that place unique demand on the county highway network, the County Highway Department should be contacted to permit temporary use of highway right-of-way. County staff will evaluate applications on a case-by-case basis. Some examples of special events include parades, marathons, bicycle races, and motorcycle rallies. Some potential characteristics of special events include temporary road closure, specific starting and ending times, unknown capacity of spectator viewing, free attendance, and unspecified parking or no parking facilities available.

It is important to consider all possible risks that may be introduced by special events. Therefore, collaboration must be made by all agencies with a functional stake in the event such as sheriffs, police departments, fire departments, emergency operations management, emergency medical services, regional health services, public works, utilities, parks & recreation, and any other city/county/state/federal agency which may be impacted.

Enhancements

In this study, enhancement projects are generally described as any project that address issues and needs identified, and may also improve the infrastructure from baseline conditions.

Each of these project categories address one or more of the issues and needs identified in Section 3 of this report. This section will serve as a brief resource for Clay County to consider for future projects.

THE ENHANCEMENT PROJECTS PROPOSED FOR CLAY COUNTY FALL UNDER FIVE PRIMARY CATEGORIES:

- Safety Enhancement
- Bridge Replacement
- Flood Mitigation
- Jurisdictional Transfer
- Corridor Improvements

Bicycle and Pedestrian Plan

This study has proposed enhancements that will directly promote the growth of active multimodal transportation with widened shoulders on County Paved – Priority Routes as part of the Major Roads Plan, specific projects that address concerns and concerns and ideas raised by public feedback, and the Clay County Trails Master Plan.

Bicycle facilities should be direct, safe, and low-stress, meaning that on-street bike systems should use routes that are not carrying higher-speed traffic, if possible. The Clay County Bicycle System should function well for cyclists of all skill levels with minimal detour or delay. One major long-term goal would be a designated bike route between North Sioux City, Vermillion, and Yankton. Trails along major corridors would be the ideal design, but on-street facilities such as bike lanes or paved shoulders may also meet this goal.

Bicyclists benefit from feeling safe and protected from moving traffic. Bikeways and trails that create an effective space or buffer from traffic with additional consideration at intersections and crossings help create an accessible bicycle network.

Separated bicycle facilities such as trails or shared-use paths offer the highest levels of safety and comfort to users due to the physical separation from motorized vehicle traffic. They offer opportunities for recreational cycling and commuting that differ qualitatively from on-street riding, thus tending to attract bicyclists of all skill levels as well as a mix of other modes. Separated bicycle facilities can be constructed through natural and scenic areas or within highway right-of-way.

BICYCLE

With the vast majority of Clay County roads being rural and high speed, the consideration for wide paved shoulders may be the most feasible and quickest means to building up its bike-friendly infrastructure. For paved roadways with no rumble strips, no curb, and no vertical obstructions immediately adjacent to the roadway, the design of 4-foot wide paved shoulders on both sides of the road is considered the minimum width to accommodate bicycle travel,[28] and 5-foot wide if in the presence guardrail, curb, or other roadside barriers. However, it is desirable to increase the width if motor vehicle speeds exceed 50 mph or if the route is used by heavy trucks, buses, or recreational vehicles. With the assumption that Clay County roads are 55 mph and used by heavy vehicles (particularly on identified priority routes on the Major Roads Plan), 6- to 8-foot paved shoulders are recommended to accommodate bicyclists.

28 AASHTO. *Guide for the Development of Bicycle Facilities, 2012 4th Edition*.

Future Bicycle Routes should provide the following recommended features:

Trail or shared-use path, physically separated from the primary roadway's motor vehicle traffic by an open space or physical barrier is most desirable. They often have their own alignments but may be located within the right-of-way of an adjacent roadway. They are typically paved bi-directional pathways and run along one side of the road.

Paved shoulder widths of 6- to 8-foot on 55 mph county highways, depending on traffic volume and heavy truck presence. The *Highway Capacity Manual (HCM)* may also be used to check the bicycle level of service (BLOS) as an additional reference to guide paved shoulder width design.

- If the minimum shoulder width of 4 feet (useable width) is used, rumble strips normally provided outside of the driving lane must be rumble stripe edge lines instead. Additional shoulder width should be provided in the presence of curbs, guardrails, roadside barriers, or any other vertical obstruction
- If rumble strips or rumble stripes are provided, periodic gaps in the rumble strips should be provided to allow bicyclists to move across the rumble strip pattern as needed.
- Shoulders should be level and there should be no abrupt drop-offs. Shoulder cross slope should consider the needs of bicyclists and pedestrians, as well as drainage.
- Shoulders should be on both sides of the road and not encourage head-to-head travel.
- Bridges should have shoulders whenever possible and have debris cleaned off regularly.
- Where unpaved driveways or crossroads meets the shoulder, it is advisable to pave some portion of the approach to prevent loose gravel from spilling onto the shoulder.
- Bicycle-safe upgrades may need to be considered near inlet grates, railroad crossings, bridge expansion joints, smooth pavements, rumble strips, and surface type transitions.

Illustration of Shoulder Rumble Strips (left) and Edge Line Rumble Stripes (right)

Source: FHWA. Rumble Strips and Rumble Stripes. https://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/bike_fs/

PEDESTRIAN

Clay County should continue to close gaps in the sidewalk and trails network across unincorporated areas. Clay County also has an opportunity to build a network of trails to promote active transportation, public health, tourism, sustainability, resiliency, and economic development.

QUICK-BUILD PROJECTS

Quick-build projects provide an opportunity for Clay County to test more walkable and bikeable street projects, road diet applications, and other space reallocation projects for various modes of transportation. Successful pilot, interim, or temporary roadway changes present an opportunity for the long-term implementation of modified street configurations.

Quick-build projects are often defined by the following four characteristics:

- **Timeline:** Implemented quicker than typical projects; typically, a few months to 1 to 2 years
- **Budget:** Small budget using interim, flexible materials; provides the time to evaluate the results and raise funds to build a permanent solution.
- **Material features:** Flexible delineator posts, paint, planters, temporary curbs, etc. are used to delineate space and calm traffic quickly at low cost. They add physical on-street features such as medians, islands, curb extensions, lanes, etc.
- **Process:** A demonstration is provided to gain support for a long-term solution using a short-term idea. This process is supported by buy-in from the community and local governments and can be scaled up into new policy or programs.

Photo: A Quick-Build Traffic Calming Concept using flexible delineators, slows traffic in advance of a crossing.
Source: City of Boulder, CO[29]

29 City of Boulder, CO. Vision Zero Innovation Program. https://bouldercolorado.gov/projects/vision-zero-innovation-program

Clay County Trails Master Plan (all routes are conceptual)

The phased construction of the Clay County Trails Master Plan will benefit Clay County for generations through increased physical activity options, quality of life, tourism, economic development, connectivity, and resiliency. Although trails carry specific funding requirements to plan, design, construct, and maintain, the economic and health benefits of a fully realized master planned countywide trails system far exceeds the capital and operational costs.

The proposed Clay County Trails Master Plan uses a phased approach and locates trails near existing transportation facilities, towns, riverways, and drainages. It builds from an existing trails network in Vermillion (Figure 26[30]) that includes existing trail connections. If constructed, new parks, trails, facilities, and development may gravitate in proximity towards the trail and trailheads. A variety of recreational opportunities could also sprout anywhere along the trail. There has been an expressed need for non-motorized kayak and canoe access on the Missouri River or Vermillion River, and this is just one example of numerous opportunities to build off of the trails master plan in Figure 27.

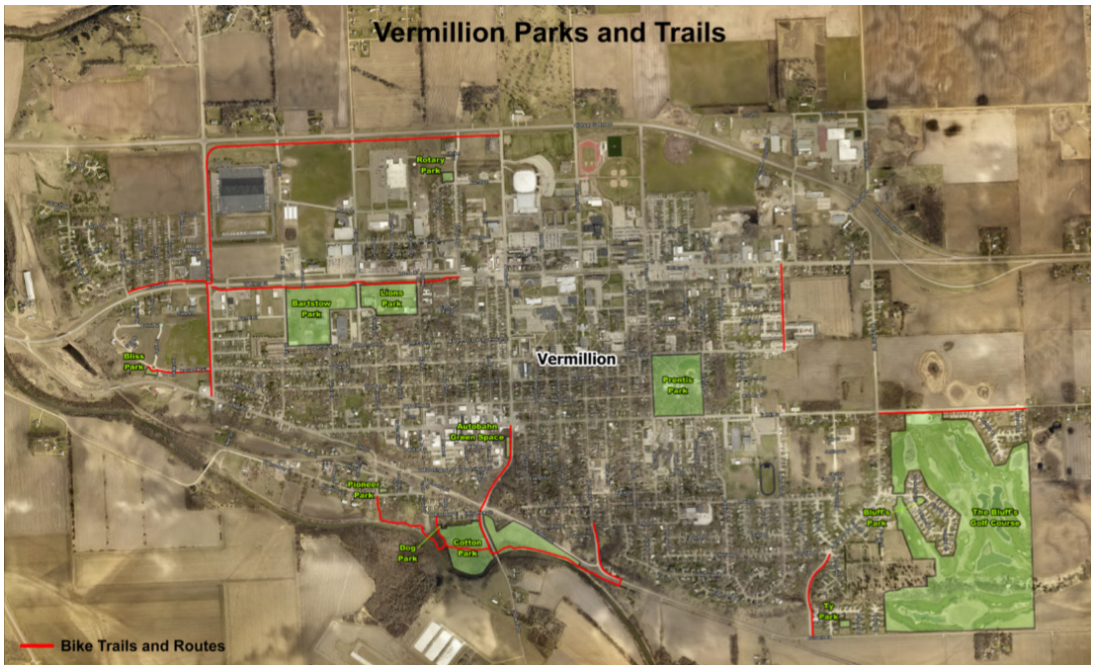
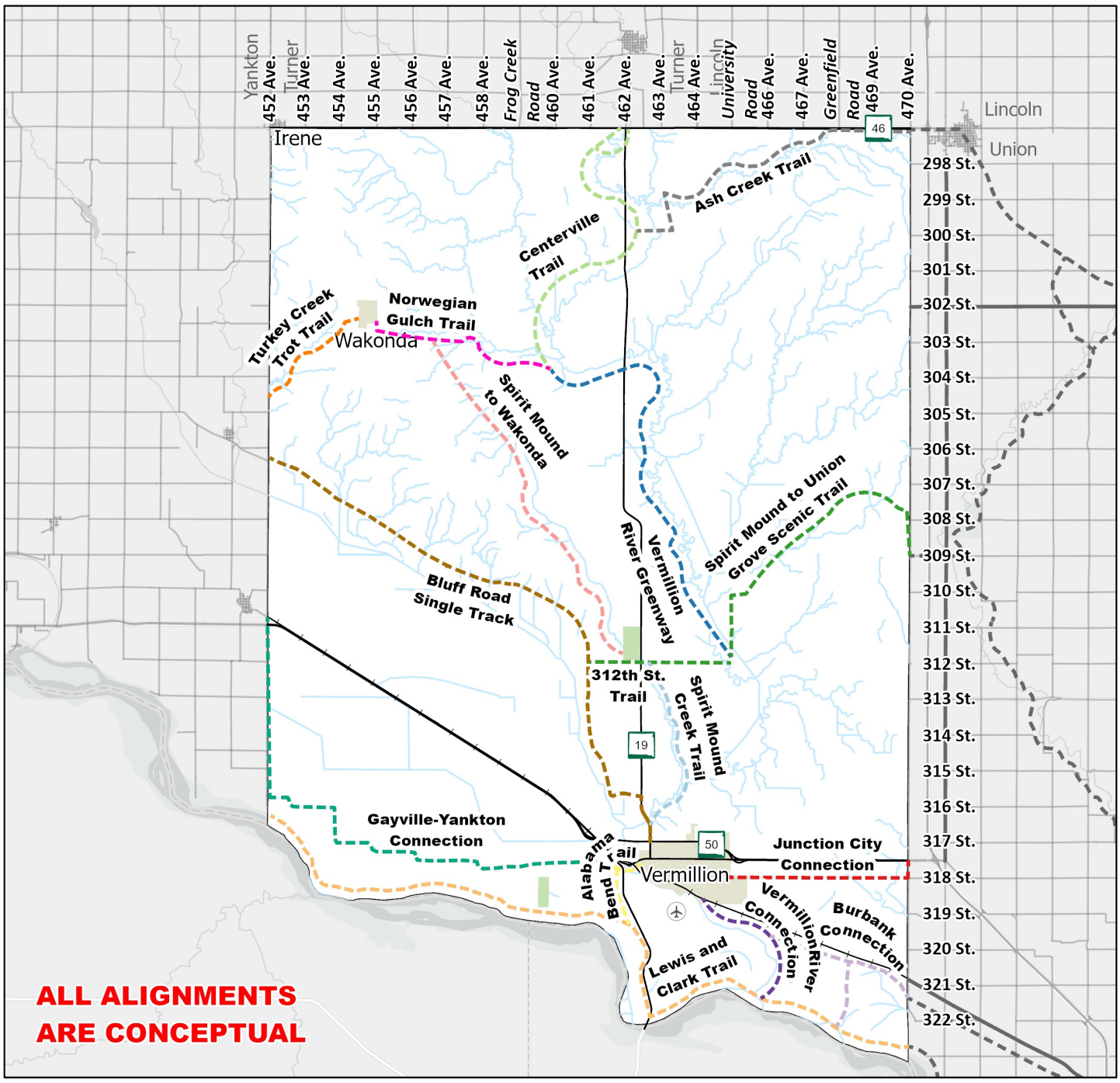


Figure 26. Vermillion Parks and Trails

30 Figure 26. Vermillion Parks and Trail System. https://www.vermillion.us/225/Parks-Trail-System



Phasing

1. Alabama Bend Trail
2. Spirit Mound Creek Trail
3. Vermillion River Greenway
4. Burbank Connection
5. Lewis and Clark Trail
6. 312th St. Trail & Spirit Mound to Union Grove Scenic Trail
7. Bluff Road Single Track
8. Vermillion River Connection
9. Spirit Mound to Wakonda
10. Norwegian Gulch Trail
11. Turkey Creek Trot Trail
12. Centerville Trail
13. Ash Creek Trail
14. Junction City Connection
15. Gayville-Yankton Connection

Park

Ulteig

Clay County Master Transportation Plan

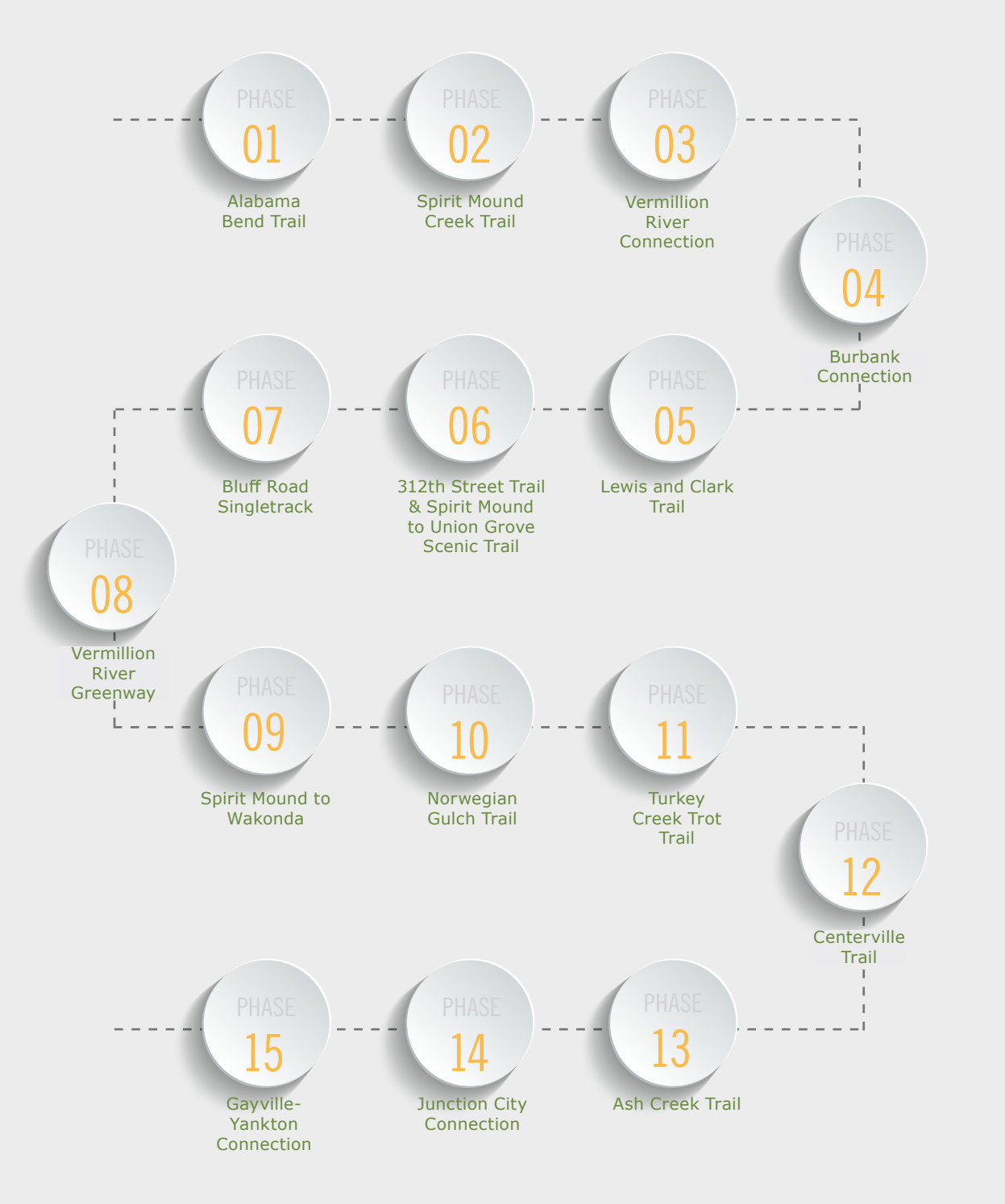
Bicycle/Pedestrian Trails Plan

0 1 2 4
Miles

N

Figure 27: Bicycle/Pedestrian Trails Plan

Clay County Trails Master Plan Phases (Conceptual)



(All phases are conceptual)

PHASE 01

Alabama Bend Trail

The Alabama Bend Trail Corridors represents an initial trail that can be relatively easily constructed as the first trail corridor of the Clay County Trails Master Plan. On the north end of the trail corridor, the Alabama Bend Trail connects to existing sidewalk at W Cherry St. and James Street in Vermillion and could follow the north or south side of W Cherry Street west across the BNSF railroad and utilizing a wide paved shoulder on the SH19 bridge over the Vermillion River. The trail follows SH19 south to access North Alabama Bend and connect to the future Lewis and Clark Trail. An alternative to this alignment exists in following South Dakota Street south of Vermillion and around Harold Davidson Field to connect to SH19/320th Street.

PHASE 02

Spirit Mound Creek Trail

The Spirit Mound Creek trail begins in Vermillion connecting to an existing shared use path on the southwest corner of SH50/SH19, trail corridor is envisioned to travel north as a concrete shared use path on the east side of SH19 crossing the Vermillion River on a widened paved shoulder of the SH19 bridge, turning east on the north bank of the Vermillion river the trail becomes a loose surface singletrack trail. The trail then turns north following Spirit Mound Creek on the west side of the creek connecting to Spirit Mound State Historic Prairie and its network of internal trails.

PHASE 03

Vermillion River Connection

The Vermillion River Connection of Phase 3 is envisioned to connect to the existing City of Vermillion shared use path south of E Chestnut Street/Burbank Road. However, this trail becomes a loose surface singletrack trail roughly following the eastern bank of the Vermillion River to the confluence with the Missouri River. Ultimately the Vermilion River Connection will connect with the future Lewis and Clark Trail along the Missouri River.

PHASE 04

Burbank Connection

This trail connects to the Vermillion River trail at Walkers Place traveling east to Saginaw Avenue north to follow a rough Rail with Trail alignment along the BNSF rail road connecting to Burbank Road. The surface of this trail is recommended to be crusher fines, asphalt, or concrete. The Burbank Connection also includes a T-shaped trail connection from Burbank to the Missouri River south along Ponderosa Drive.

(All phases are conceptual)

PHASE 05

Lewis and Clark Trail

Phase 5 of the Clay County Trails Master Plan is a trail corridor originally envisioned by the National Parks Service. The Lewis and Clark Trail Corridor through Clay County is envisioned to use a crusher fines surface and loosely follow the northern bank of the Missouri River from west to east connecting into the Union County Trails Master Plan (planned) section of the trail. This trail is envisioned to have places to stop and lookout over the river, it should include benches, interpretative signage, wayfinding signage, and include occasional parking lots with restrooms, picnic tables, bicycle maintenance stations, and boat ramps/launches.

The Lewis and Clark Trail will be a heavy tourism/recreational draw and will require weekly and monthly maintenance such as trash removal, trail restoration activities, brush thinning/clearing, and occasional law enforcement patrols. The Lewis and Clark trail is a candidate to be reprioritized to Phase 1 depending on available funding.

PHASE 06

312th Street Trail & Spirit Mound to Union Grove Scenic Trail

Phase 6 provides a vital east/west connector trail that will eventually tie together five different trails into the Clay County trails network. 312th Street will host a loose surface or crusher fines trail connecting Bluff Road on the west to Spirit Mound and on to the Vermillion River on the East. The eastern end of the 312th Street Trail crosses a bridge over the Vermillion River and is envisioned to follow an unnamed creek to the northwest, the alignment of this trail is very loose and will likely need to meander northwest crossing fields, following roadways, to cross I-29 at a drainage underpass to the southwest of Union Grove, the trail then connects to Union Grove State Park in Union County.

PHASE 07

Bluff Road Singletrack

Bluff Road is a scenic route in Clay County, a loose surface singletrack trail is envisioned to travel along the entire northeastern side of this roadway corridor connecting SD19 with the town of Volin in Yankton County. On the eastern end of the corridor an agreement will need to be reached with SDDOT to allow the Bluff Road Singletrack to follow SD19 for approximately .66 miles as a concrete or crusher fines Shared Use Path to connect with the Spirit Mound Creek Trail and the Vermillion River SD19 Bridge.

The Bluff Road Singletrack trail is envisioned to primarily travel within Clay County Right of Way, however there may be opportunities to identify trail loops and offshoots into some of the washes, forests, and hill country to the northeast of the trail corridor if adjacent property owners are open to the idea.

Photo: Example of a ride-over cattle guard on a singletrack trail, this apparatus allows bike and ped access across grazing lands without requiring the use of gates.

MAINTENANCE OF SINGLETRACK TRAILS

Singletrack trails are one of the easiest ways to implement a new trail corridor. Because they are narrow (about 3 feet wide, wide enough for a walker or bicyclist) and low maintenance, they have low start-up and maintenance costs. They are appealing to both summer and winter users (walking, mountain-biking, horseback riding, cross-country skiing, snow-shoeing, etc.). Typically, small construction equipment or a trails crew will dig vegetation away from the travel surface of the trail. On singletrack trails that travel up or down grades, a best practice is to dig drainage ways that cut across the trail to drain water to the side of the trail limiting erosion of the trails surface.

Typical maintenance activities include drainage maintenance at least once per year. Vegetation control and maintenance will be required as needed to keep the corridor foliage-free over the track. Clearing could also be required after severe weather, especially for fallen trees. Winter maintenance is minimal or negligible to attract cross country skiing and fat bikes. Annual maintenance costs for a singletrack trail are estimated to be $1,000 per mile but should be refined once all variables are accounted for. Some terrain types will require less maintenance and volunteer efforts can also reduce costs to the organization in charge of maintenance. Therefore, the real cost of maintenance may not be fully understood until the trail is in place. A written maintenance plan is recommended before administering any new trail.

Source: https://www.singletracks.com/mtb-trails/learning-to-build-mtb-trails-with-tony-boone/

Photo: Example of a ride-over cattle guard adjacent to a vehicular access gate. This particular ride-over cattle guard is wide enough and strong enough to accommodate a 4-wheeler or narrow side by side UTV in addition to bicyclists and hikers.

(All phases are conceptual)

PHASE 08

Vermillion River Greenway

Originating from the eastern end of the 312th Street Trail, the Vermillion River Greenway is another scenic route in Clay County, a loose surface singletrack trail or crusher fines trail is envisioned to travel along the west bank of the Vermillion River traveling north. The trail could follow the riverbank, cut through the surrounding forest, or travel at the edge of the forest, the alignment would cut off sharp river bends. The Vermillion River Greenway is envisioned to have places to stop and lookout over the river, it should include benches, interpretative signage, wayfinding signage, and include occasional parking lots with restrooms, picnic tables, and bicycle maintenance stations. Since the trail cuts off around sharp river bends, there will be ample opportunity to utilize river bends as remote picnic areas, small parks, hunting reserves, wildlife refuges/waterfowl breeding areas, or bike/backpack accessible camp sites.

PHASE 09

Spirit Mound to Wakonda

Beginning from Spirit Mound State Historic Prairie, Phase 9 follows Spirit Mound Creek northwest through the Pleasant Valley area then continues to meander northwest roughly following the creek as a loose surface singletrack trail to connect to the Norwegian Gulch Trail on the north end.

PHASE 10

Norwegian Gulch Trail

Originating from the northern end of the Vermillion River Trail, the Norwegian Gulch Trail connects west along the south side of Norwegian Gulch to the Town of Wakonda, as a loose surface singletrack trail.

PHASE 11

Turkey Creek Trot Trail

Originating from the west side of the Town of Wakonda, the "Turkey Creek Trot" Trail follows the south side of Turkey Creek as a loose surface singletrack trail to the western county line. However, the Trot is envisioned to connect into the Town of Volin, in Yankton County.

(All phases are conceptual)

PHASE 12

Centerville Trail

The Centerville Trail begins at the confluence of two other trails: the northern end of the Vermillion River Greenway and the eastern end of the Norwegian Gulch Trail. The Centerville trail continues with the same attributes as the Vermillion River Greenway in terms of surface type, signage, and amenities.

The alignment of the Centerville Trail generally follows the west bank of the Vermillion River travelling north. The trail could follow the riverbank, cut through the surrounding forest, or travel at the edge of the forest, the alignment would cut off sharp river bends, and there will be ample opportunity to utilize river bends as remote picnic areas, small parks, hunting reserves, wildlife refuges/waterfowl breeding areas, or bike/backpack accessible camp sites.

PHASE 13

Ash Creek Trail

The Centerville Trail begins at the confluence of two other trails: the northern end of the Vermillion River Greenway and the eastern end of the Norwegian Gulch Trail. The Centerville trail continues with the same attributes as the Vermillion River Greenway in terms of surface type, signage, and amenities.

The alignment of the Centerville Trail generally follows the west bank of the Vermillion River travelling north. The trail could follow the riverbank, cut through the surrounding forest, or travel at the edge of the forest, the alignment would cut off sharp river bends, and there will be ample opportunity to utilize river bends as remote picnic areas, small parks, hunting reserves, wildlife refuges/waterfowl breeding areas, or bike/backpack accessible camp sites.

PHASE 14

Junction City Connection

The Junction City Connection begins on 318th Street at the Vermillion city limits. The Junction City Connection travels east to Junction City following the north side of 318th Street. East of 468th Avenue, the Junction City connection will have to cross a gap of private property and a creek to connect back to 318th Street at 469th Avenue. The Junction City connection then connects to Junction City via 470th Avenue and along the south side of SD 50 connecting to Junction City.

PHASE 15

Gayville-Yankton Connection

The Gayville-Yankton Connection begins at the intersection of the Alabama Bend Trail and Timber Road on the west side of Vermillion. The trail connects to 318th Street at the Vermillion city limits. The Gayville-Yankton Connection travels west towards Yankton using a series of roadway connections in the following order: Timber Road, 454th Avenue, 316th Street, to 452nd Avenue north along the county line to Gayville.

CLAY COUNTY TRAILS MASTER PLAN IMPLEMENTATION

Shared vision, local buy-in, a local champion, grant awards, and coordination with local governments, transportation utilities, and private landowners will be required to complete the Clay County Trails Master Plan. Identification of an organization to build and maintain Clay County trails is crucial. The Clay County Trails Master Plan covers a large portion of Clay County and has multiple potential connection points to neighboring counties. It is recommended to build the trails network out in phases, break each phase into segments.

A separate Clay County Trails Implementation plan or feasibility study is recommended for next steps including:

- Identification of a local champion, and maintenance organization
- Prioritize trail corridors
- Prepare preliminary alignments
- Design trail cross-sections and dimensions for each alignment and phase
- Perform trail right-of-way analysis, including parcel by parcel analysis for initial priority corridor trail segments
- Build preliminary cost estimates for each trail corridor
- Perform detailed mapping and analysis
- Hold public meetings and online opportunities for public feedback

ON-STREET BIKE ROUTES

Roads with the proposed classification of County Paved – Priority Route attract bicyclists because they connect communities and destinations. As such, this study recommends that designs for these routes should strongly consider wide shoulders (6- to 8-foot) due to high speeds and possible presence of heavy trucks, buses, or recreational vehicles. However, not all routes identified with this classification can feasibly be constructed with optimal shoulder width due to cost. Thus, one of the considerations that justify the addition of wide paved shoulders is the demand or potential demand from bicyclists. Although any road with wide paved shoulders would provide extra space for bicyclists and occasional pedestrians, the addition of wide paved shoulders (if adequate width is not currently present in both directions to accommodate bicycle travel as defined by AASHTO) and Bike Route designation for the following roadways (Figure 29) in Clay County (County and State routes included) is a concept that would align well with the proposed Trails Master Plan:

- SD 19 – from Turner County border in the north to Nebraska State border in the south (Missouri River)
- SD 46 – from Yankton County border in the west to Union County border in the east
- SD 50 – from Yankton County border in the west to Union County border in the east
- 302 St – from Yankton County border in the west to Union County border in the east
- Greenfield Rd – from Lincoln County border in the north to SD 50

Intergovernmental agreements and cooperation are essential for ensuring that on-street bike routes are continuous across jurisdictional boundaries and provide connectivity into towns and bicycle access across the county and region. Some of the on-street bike routes shown above are within SDDOT jurisdiction.

CASE STUDY – VILAS COUNTY TRAILS NETWORK IN WISCONSIN

How successful design in Wisconsin could be applied to Clay County

Vilas County, located in northern Wisconsin on the border of Michigan's upper peninsula with a population of approximately 23,000 people has successfully implemented multiple bike and pedestrian trails[31] countywide. The paved paths and gravel trails are so well utilized that the trails have created an economy around biking and hiking in Vilas. Trails connect people to the many lakes in the area, businesses in multiple cities, and even into neighboring Michigan's Northwoods. The Great Headwaters Trails Foundation has helped to create trails in the county as a public-private partnership non-profit since 2010. The Great Headwaters Trails values low impact trails, public access, non-motorized alternatives for transportation, recreation, and health, as well as enhancing economic infrastructure and partnerships across the county. Vilas is already an outdoor recreation destination for the region, and they are planning for more trails to be connected in the future.

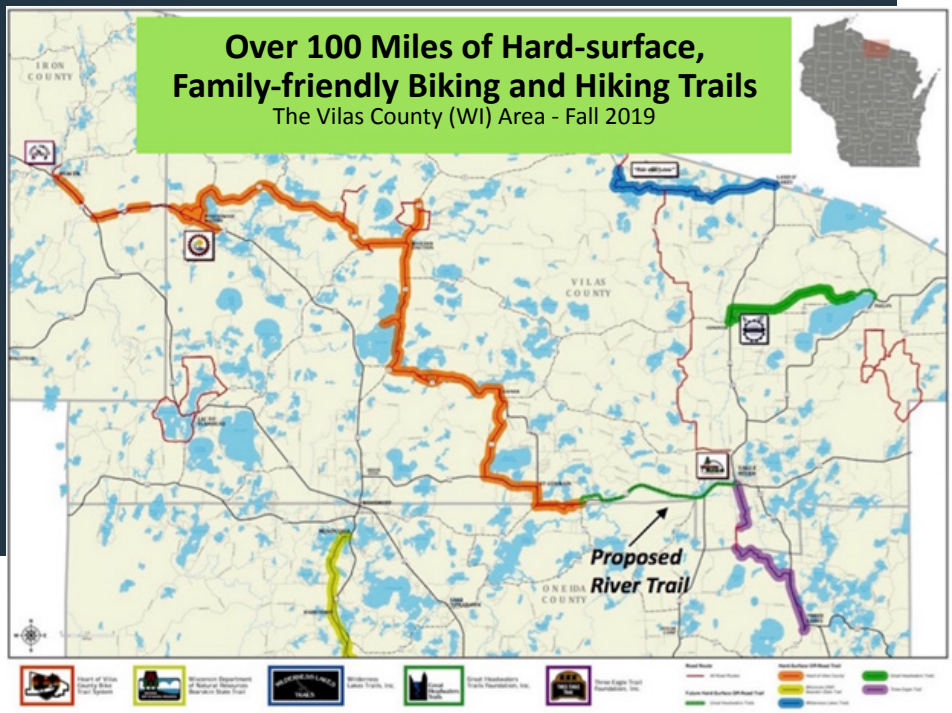
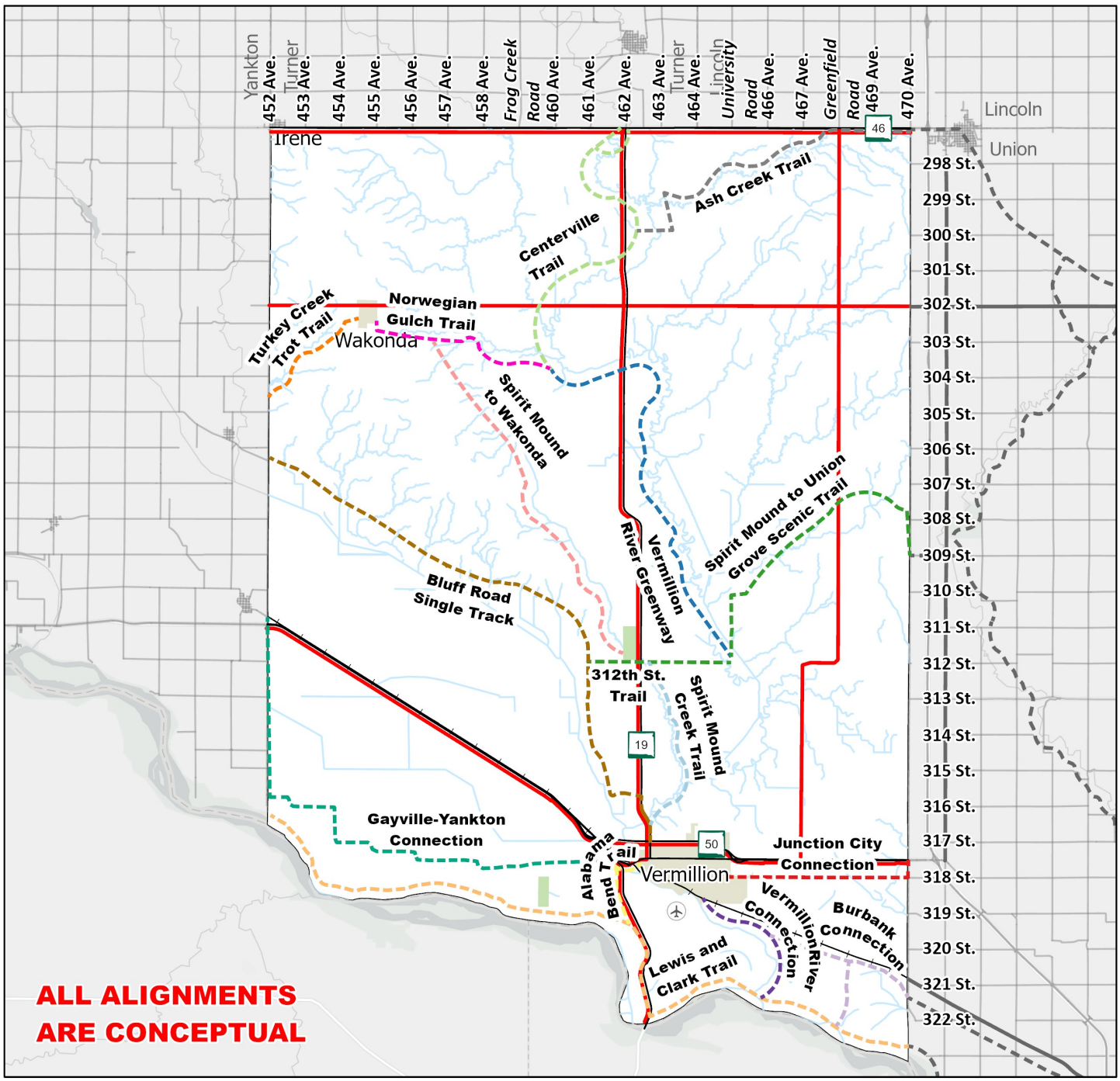


Figure 28. Vilas County Trails Network

31 Vilas County Area Trails Network: https://ghtrails.org/wp-content/uploads/2019/11/River-Trail-update11-2019.pdf



Phasing

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- 11. Turkey Creek Trot Trail
- 12. Centerville Trail
- 13. Ash Creek Trail
- 14. Junction City Connection
- 15. Gayville-Yankton Connection
- Park
- On Street Bike Route

Ulteig

Clay County Master Transportation Plan

Trails/On Street Bike Route

0 1 2 4
Miles

N

Figure 29: Trails/On Street Bike Route

GRANTS AND FUNDING

Grants can be a great way to supplement or bolster funding for trails projects. However, using grants require both funding and staff time to identify projects, grants, and fill out the grant application forms, each of which have different requirements and take different levels of administrative burden to complete. Grants are also typically a competitive process and are inherently risky as not all applications will win a grant award. Some grants require a specific percentage cash match from the applicant or in-kind contribution. Grants for trails include:

SDDOT Transportation Alternatives Program (TA)

Transportation Alternatives[32] is a program that uses federal transportation funds – designated by Congress – for specific activities that enhance the inter-modal transportation system and provide safe alternative transportation options. Transportation Alternatives (TA) is authorized by the Fixing America's Surface Transportation Act (FAST Act) as part of the Surface Transportation Block Grant (STBG) program.

The SDDOT TA encompasses a variety of smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to storm water and habitat connectivity.

Approximately $4.6 million will be available for TA in South Dakota per the 2023 application cycle. These funds will be available through a competitive project selection process administered by the SDDOT Office of Project Development. Each individual project may be approved for a maximum of $600,000 in Federal funds, although SDDOT may approve a larger amount for phased projects. There is no minimum cost for non-infrastructure projects, and there is a $50,000 minimum cost for infrastructure projects. The minimum local match is 18.05%.

Eligible activities include:

- Facilities for pedestrians, bicyclists, and other non-motorized forms of transportation
- Safe routes for non-drivers
- Conversion and use of abandoned railroad corridors for trails
- Construction of turnouts, overlooks, and viewing areas
- Planning and implementation of community improvement activities
- Environmental mitigation
- Implementation of the Safe Routes to School Program
- Boulevards and other roads largely in the right-of-way of former Interstate System routes or other divided highways

South Dakota Game Fish and Parks – Recreational Trails Program (RTP)

The Recreational Trails Program[33] provides partial reimbursement for approved trail projects. Eligible projects include construction of new public trails, rehabilitation of existing public trails, development of trail-related facilities and educational programs that relate to recreational trails.

The RTP funds come to the state through the FHWA and are apportioned to states by Congress to fund both motorized and non-motorized public recreation trail projects. The amount of funds available is based upon the number of recreational vehicles licensed in each state.

32 SDDOT TA Application (or contact SDDOT Planning Engineer): https://dot.sd.gov/programs-services/programs/transportation-alternatives#listItemLink_1420

33 SD Game, Fish and Parks RTP Application (or contact SD Game, Fish and Parks Grants Coordinator): https://gfp.sd.gov/UserDocs/nav/rtp_application.doc

US Environmental Protection Agency – Recreation Economy for Rural Communities (RERC)

The Recreation Economy for Rural Communities[34] planning assistance program helps communities identify strategies to grow their outdoor recreation economy and revitalize their Main Streets.

Activities include the following and more:

- Developing or expanding trail networks to attract overnight visitors and new businesses and foster use by local residents.
- Developing in-town amenities, such as broadband service; electric vehicle charging stations; housing; or shops, restaurants, or breweries, to serve residents and attract new visitors and residents with an interest in nearby outdoor assets.
- Marketing Main Street as a gateway to nearby natural lands to capture and amplify outdoor recreation dollars.
- Ensuring that all residents and visitors have access to and can benefit from the growing outdoor recreation economy.

AARP - AARP Livable Communities Challenge

Grant funded quick-action projects to help communities become more livable for people of all ages.[35] Applications are accepted for projects for public spaces, housing, transportation, civic engagement, COVID-19 pandemic recovery, diversity, inclusion, and more. Eligible applicants include government entities, non-profit organizations, and other types of organizations. Grant amounts vary.

Wellmark Foundation MATCH Grant Program – (IA & SD)

The Wellmark Foundation[36] offers two competitive Matching Assets to Community Health (MATCH) grant opportunities for projects that intend to support communities in achieving better health by making it easier to eat healthy and engage in everyday physical activity. Requests up to $100,000 can be made to the Access to Healthy Foods and Built Environment MATCH Grant. This grant requires a dollar-for-dollar match, with at least one-half of that amount being cash.

The Wellmark Foundation will consider applications for:

- Trails, including links, spurs, and connectors
- Safe Routes to School plans and infrastructure
- Accessible and safe walking paths or routes
- Share-the-Road plans and infrastructure, inclduing safe crossing signs and lights
- Bike-share programs and infrastructure
- Wayfinding signage, trail makers

34 US Environmental Protection Agency RERC Application: https://www.epa.gov/smartgrowth/recreation-economy-rural-communities
35 AARP Community Challenge Application: https://www.aarp.org/livable-communities/community-challenge/
36 Wellmark Foundation MATCH Program Application: https://www.wellmark.com/foundation/grants/grant-information/matching-assets-to-community-health

America Walks – Community Change Grants

The Community Change Grant program[37] supports the growing network of advocates, organizations, and agencies working to advance walkability. Grants are awarded to innovative, engaging, and inclusive programs and projects that create change and opportunity for walking and movement at the community level. The number of grants awarded varies each year.

Competitive Infrastructure Funding Opportunities for Local Governments

As of January 2022, the White House has shared a Fact Sheet listing competitive funding opportunities for local governments as part of the Bipartisan Infrastructure Law.[38]

$1.2 Trillion Infrastructure Investment and Jobs Act (IIJA)

The largest and most comprehensive infrastructure bill in American history passed by Congress on November 6, 2021, will reauthorize surface transportation programs for five years and invest $110 billion in additional funding to repair roads and bridges. As a result, states will get multi-billion dollar windfall investments to their physical infrastructure over the next five years. Of the $2.846 billion South Dakota is positioned to receive, $1.9 billion will be for highway apportioned programs and $225 million will be for bridge replacement and repairs.[39] These funds will filter down to South Dakota counties like Clay County and is expected to help in the replacement of existing bridges. The PROTECT (Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation) Formula Program is also part of the IIJA. Funding from this program is available to states over the next five years and focuses on making transportation infrastructure more resilient to future weather events.[40]

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37 America Walks – Community Change Grants Application: https://americawalks.org/programs/community-change-grants-2021/

38 The White House – Building A Better America: https://www.whitehouse.gov/wp-content/uploads/2022/01/BIL-Factsheet-Local-Competitive-Funding.pdf (January 20, 2022)

39 The White House – The Infrastructure Investment and Jobs Act will Deliver for South Dakota: https://www.whitehouse.gov/wp-content/uploads/2021/08/SOUTH-DAKOTA_Infrastructure-Investment-and-Jobs-Act-State-Fact-Sheet.pdf (August 2021)

40 FHWA. Information – Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Formula Program Implementation Guidance: https://www.fhwa.dot.gov/environment/sustainability/resilience/policy_and_guidance/protect_formula.pdf (July 2022)

Applying for Grants

Grants can be a great way to supplement or bolster funding for projects. However, grants require both funding and staff time to identify projects, grants, and fill out the grant application forms, each of which have different requirements and take different levels of administrative burden to complete. Grants are also typically a competitive process and are inherently risky as not all applications will win a grant award. Some grants require a specific percentage cash match from the applicant or in-kind contribution. Grant opportunities for trails are shown above in the previous section of this report. Some best practices for pursuing grant funding are shown in the graphic to the right.

Systematic safety improvements such as the SDDOT-funded County-wide signing replacement program, rumble strips, and regular re-striping are strategies that improve safety for the entire network and is a great way to lower the likelihood of crashes. This study also makes safety recommendations and enhancements based on the safety assessment, special locations analysis, and public feedback. See Section 6 of this report for proposed safety enhancement projects.

BEST PRACTICES FOR PURSUING GRANT FUNDING

- Need adequate preparation to position for a grant, including holding calls or meetings with grantors, securing any support or permission from stakeholders, and compiling data and documents to support the grant application.
- The greater the amount of funding, the greater the amount of work is typically needed to prepare and administer the grant.
- Participate in all the webinar and preparation opportunities provided by the grantor, request a one-on-one opportunity to describe your project to the grant administrator.
- Quality applications are important.
- It is more efficient to put effort into a quality ask and win vs. less effort into multiple applications that are not likely to be funded.
- Clay County can potentially qualify for multiple types of grants related to transportation infrastructure projects including:
  - State Grants: SSDOT, South Dakota Lottery
  - Federal Grants: FHWA, HUD, USDOT, National Park Service
  - Other Grants: Local flood districts, non-profit organizations, FEMA

Safety

PROVEN SAFETY COUNTERMEASURES

In 2008, FHWA began promoting the widespread use of certain infrastructure-oriented safety treatments and strategies that can offer significant, measurable impacts to improve safety. These *Proven Safety Countermeasures*[41] (PSCs) are effective in reducing roadway fatalities and serious injuries. Agencies are strongly encouraged to consider widespread implementation of PSCs to improve safety. In 2021, nine new PSCs were added to the list. There are now a total of 28 different PSCs, addressing a variety of crash types and focus areas such as speed management, roadway departure, intersection, pedestrian, and bicyclist crashes.

INCORPORATING SAFETY INTO THE PLAN

Individual crashes are random events by their nature, often with multiple contributing factors. Crash patterns are revealed over time, and crash factors are exposed. Crash reduction measures are often applied after it becomes apparent where crash rates are higher, particularly with severe crashes. System-wide crash reduction measures can also be applied at any time, such as sign installation programs, rumble strips, or new construction design elements that incorporate wider shoulders, flatter ditch slopes, and removing or relocating fixed objects.

- The absence of paved shoulders and rumble strips on roadways may increase the risk of run-off the road crashes.
- Purchase right-of-way in order to provide wider shoulders along roadway.
- Install shoulder rumble strips if applicable throughout the corridor.
- Install centerline rumble strips (CLRS) if applicable. CLRS are a proven low-cost safety improvement to reduce target crash types. Target crashes for CLRS are head-on (less than 1% of all crashes in Clay County), sideswipe opposing (1% of all crashes in Clay County), and run-off-road left (5% of all crashes in Clay County).

The presence of steep ditches close to the edge of the pavement may increase the risk of vehicle overturns/rollovers (4% of all crashes in Clay County).

- Purchase right-of-way in order to provide wider shoulders and/or flatter slopes along roadway.
- Install guardrail where the slopes are not traversable (steeper than 3:1 slope rate) or where the clear zone cannot be kept clear.

High speeds (7% of all crashed in Clay County) on the roadway may increase the likelihood and severity of all types of crashes.

- Improve roadway signing and enhanced pavement markings, including centerline rumble strips.
- Install street lighting if feasible (34% of all crashes in Clay County occurred on roadways not lighted).
- Install warning and advisory signs if not in place, especially along curves (6% of all crashes in Clay County are on curves).
- Install dynamic warning signs
- Reduce approach speeds at intersections with visual changes such as effectively reducing the lane width (narrowing intersections).

41 FHWA. Proven Safety Countermeasures. https://safety.fhwa.dot.gov/provencountermeasures/

To mitigate risk for pedestrians and bicyclists along high-speed corridors,

- Provide widened shoulders, bike lanes, shared-use paths, trails, and/or sidewalks.

To mitigate risk for motorcyclists along high-speed corridors,

- Encourage the wearing of helmets, which are effective at helping to prevent fatal injuries to motorcyclists and passengers.
- Aggressive impaired driving enforcement for all motorists reduces motorcycle fatalities and serious injuries due to a higher rate of involvement of motorcycle riders in impaired driving crashes (3-star SHSP[42] Key Strategy)
- High-Visibility enforcement of aggressive driving and speed laws to reinforce established speed limits (3-star SHSP Key Strategy)
- Rider education and training courses (2-star SHSP Key Strategy)
- Continue to promote SouthDakotaRides.com (1- or 2-star SHSP Key Strategy)
- Provide paved shoulders for recovery and breakdowns
- Continue to apply fog seals after every chip seal to retain loose rocks and chips. Provide notices to the public for times between the chip seal application and the fog seal application, which is often 1 to 2 days. Post warning signs about loose rock chips. Ensure loose chips are swept up upon completion.
- Take care during crack sealing operations to not unnecessarily create large traction concerns for motorcyclists, as the sealing surfaces are slick when wet.
- High Friction Surface Treatment (HFST) can be considered to be applied in locations with increased friction demand such as horizontal curves and stop-controlled intersection approaches. It is a low-cost safety treatment when compared to cost of repaving or realignment of curves. It is not a pavement preservation technique, and there are factors to consider before determining candidate locations for this treatment.

42 SDDOT. *South Dakota Strategic Highway Safety Plan* (SHSP), 2019.

Flood Mitigation

Flooding was not formally in the scope of this plan but is a pervasive issue each year for Clay County. Future mitigation strategies are explored below to help prevent the current impacts of flooding. Focus group meetings about current flood issues were held with county stakeholders to understand the areas most affected and potential solutions. In Figure 30, proposed emergency routes during flood events were identified as well as locations for future road projects to prevent water from overtopping the road or mitigate the damage when overtopping does occur. The relative frequency of flooding experienced in the past was noted by the group and ultimately divided into general "staging" categories, where minor stage flooding occurs occasionally, once every handful of years; moderate stage flooding occurs less frequently; and major stage flooding has occurred once or in only the most severe circumstances. Comments from the focus group are also shown in the margins of the figure. Emergency routes are identified in yellow; these routes generally avoid 100- and 500-year flood events as well as current flood prone areas, except in cases where extensive detour routes would be required, such as 302 St, which is a primary route for Wakonda Emergency Fire Services to the east.

FLOOD MITIGATION STRATEGIES

Seasonal flooding has routinely affected county roads, forcing temporary closure, major repairs, or permanent closure. Understanding flooding patterns can help Clay County prepare for the inevitable road closures and detours that occur during flood events. Some locations may be due for an improvement that overcomes flooding issues, but some locations may need to adapt to the reality that flooding will occur. Table 14 lists potential roadway improvement projects that could take place to mitigate current locations with flood issues along the Clay County road network.

Table 14. Future Flood Mitigation Projects

County Road	Location	Surface Type	Flooding Frequency	Potential Mitigation Type*
300 St	Between SD 19 and 463 Ave	Gravel	Minor Stage	Grade raise**
302 St	Between 460 Ave and 461 Ave	Asphalt	Minor Stage	Grade raise, add culverts**
306 St	Between SD 19 and 464 Ave	Asphalt	Minor Stage	Floodway treatment in place
309 St	Between 464 Ave and University Rd	Gravel	Minor Stage	Floodway treatment
457 Ave	Between Bluff Rd and 311 St	Asphalt	Major Stage	None, flooding not as frequent
University Rd	Between 308 St and 309 St	Asphalt	Minor Stage	Floodway treatment
Intersection	312 St & University Rd	Asphalt	Minor Stage	Floodway treatment
University Rd	Between 314 St and 316 St	Asphalt	Moderate Stage	Floodway treatment

**Hydraulic or feasibility study is recommended at each location*
***Grade raise may affect function of existing bridge structure*

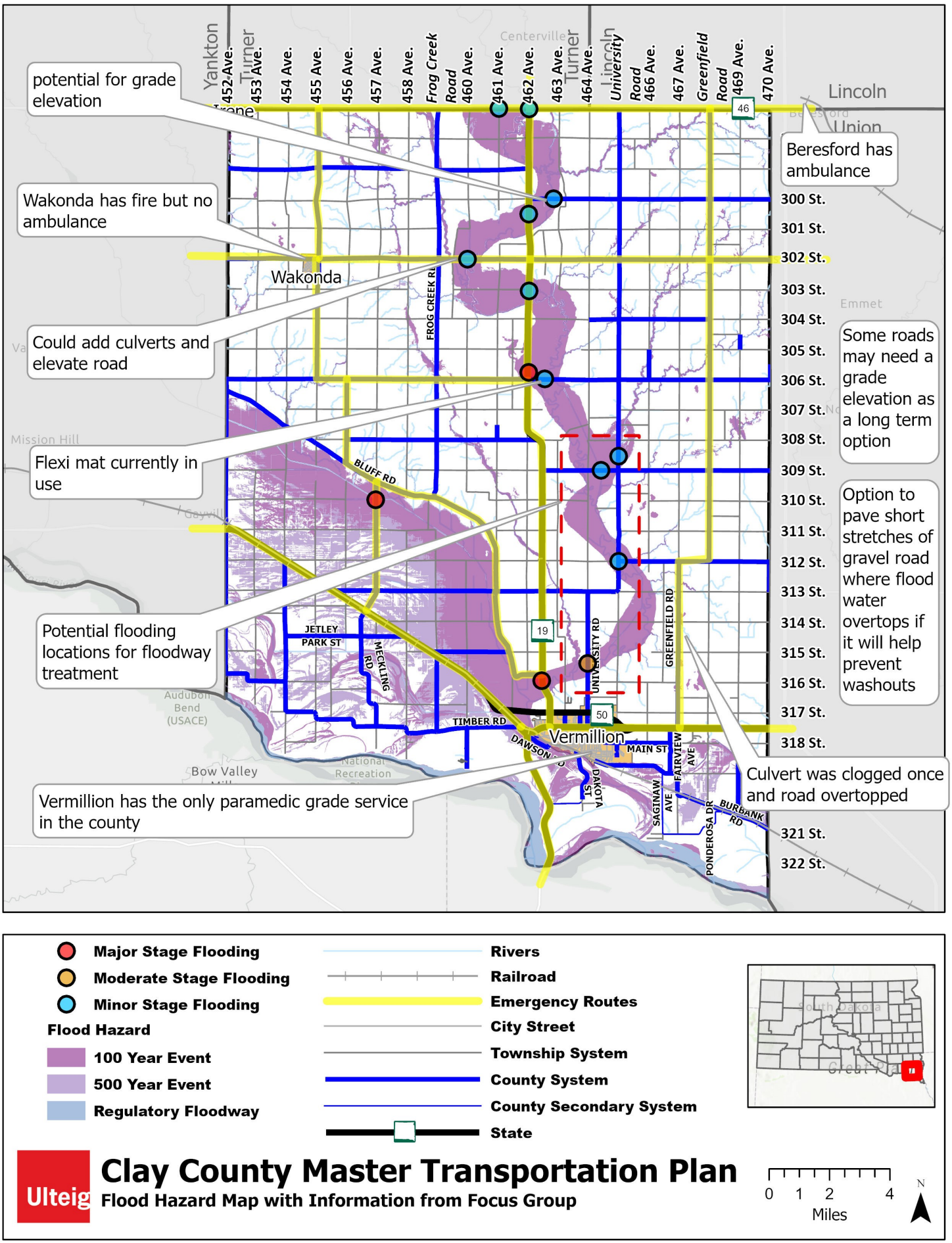

Figure 30: Flood Hazard Map with Information from Focus Group

Flood Maps

Flood maps showing different water level scenarios are excellent tools for public works staff and can help evaluate safety and serviceability during times when floods overtop the road at different flood depths. A good understanding of when flooding occurs, flood levels, and flood frequency can better inform flood mapping, emergency flood routing, and evacuation routes. See Figure 30 for an example of a flood map for Clay County.

Development of Roadway Floodways

In flood prone areas, a floodway is a roadway constructed in the drainage path of floodplains, but specially designed to withstand a temporary flood condition that overtops the roadway surface. A road with a floodway runs perpendicular to the flow of flood waters causing the road to act like the spillway of a dam. Floodways can use reinforcement on the roadway shoulders and embankment to prevent floodwater eddies, which erode the shoulder and undermine the base material under the roadway. Typically, floodways are county roads, lower priority routes, and local roads. Higher priority roads such as state highways and interstates are not recommended or allowed for use as floodways. The dimensions (width and height) of the floodway should be chosen to ensure that floodwater spreads widely across the road to decrease flow velocity and reduce scour. Recommended lengths of floodways are generally about 1,000 feet and are built on straight stretches, not on horizontal curves.

Paved surfacing is preferred for use in floodways but stabilized base course may be used for floodways on low traffic roads where time under water is expected to be less than 3 days per year. Another option is to pave sections of gravel road expected to perform as a floodway. Depending on the depth of the flood, an indication of the road route and depths at different points on the road should be provided. Barrier rails and other barriers are a significant obstruction to flow over the channel and should be avoided, but object marker posts may be used. Floodways should have a warning sign as well.

Clay County is currently applying a type of floodway along 306 St, utilizing a flexi-mat to reinforce shoulders (see photo).

Advantages of Floodways:

- Cost less than bridges and grade raises
- Ensure controlled, well directed areas of overflow
- Helps preserve wetland functions
- Allow roads in floodplains to have lower embankments, saving costs and increasing safety by reducing run off the road rollover type crashes.

Disadvantages of Floodways:

- During high flood levels floodways are not passable and traffic must be detoured.

By reinforcing the shoulder areas and embankment slopes of floodways, resiliency and flood survivability is built into the roadway, lessening the probability that the roadway will be washed out during a flood event. More information can be found on technical floodway information at www.roadsforwater.org

See Figure 31 for a detail on how a preliminary floodway design could be created using GIS (geographic information system) tools.

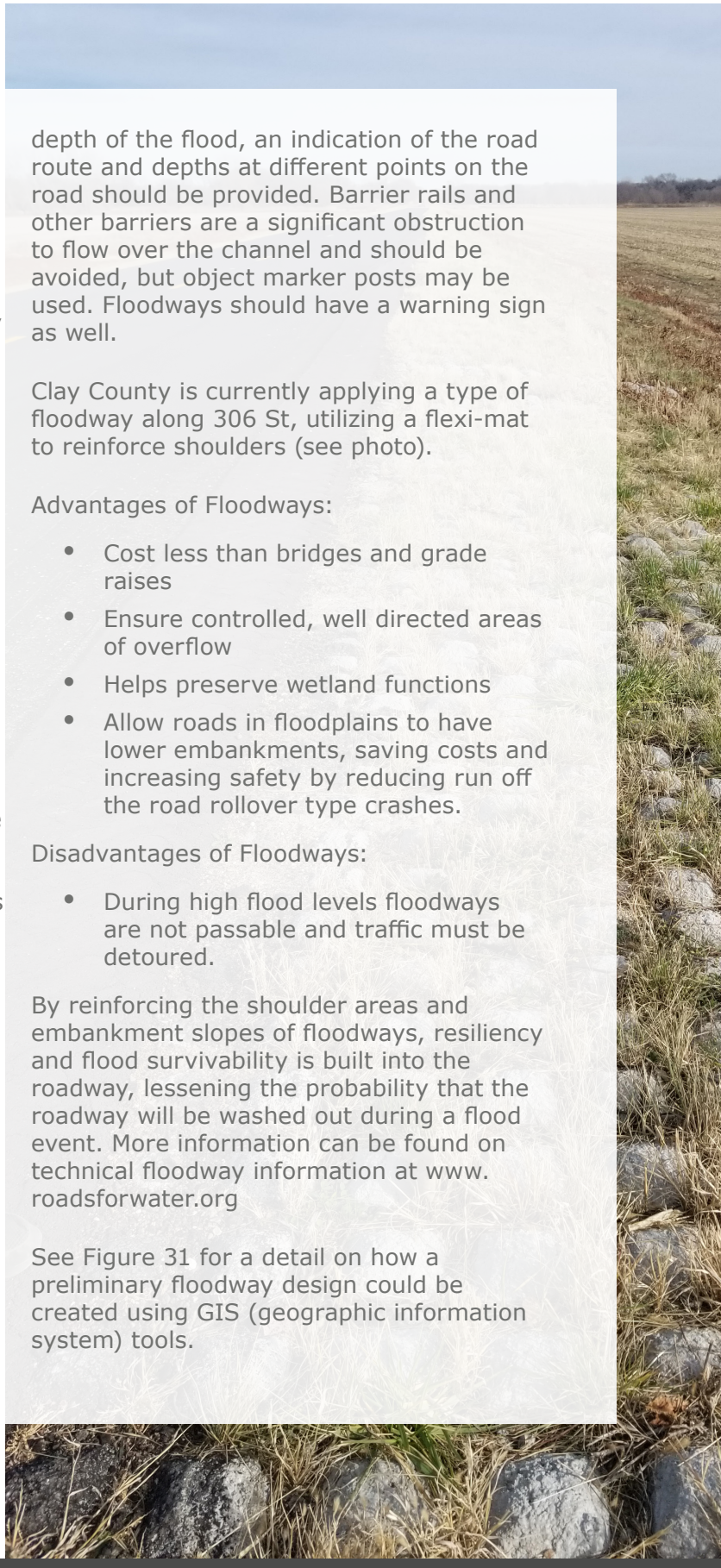

Photo: Floodway with reinforced shoulders in Clay County, SD

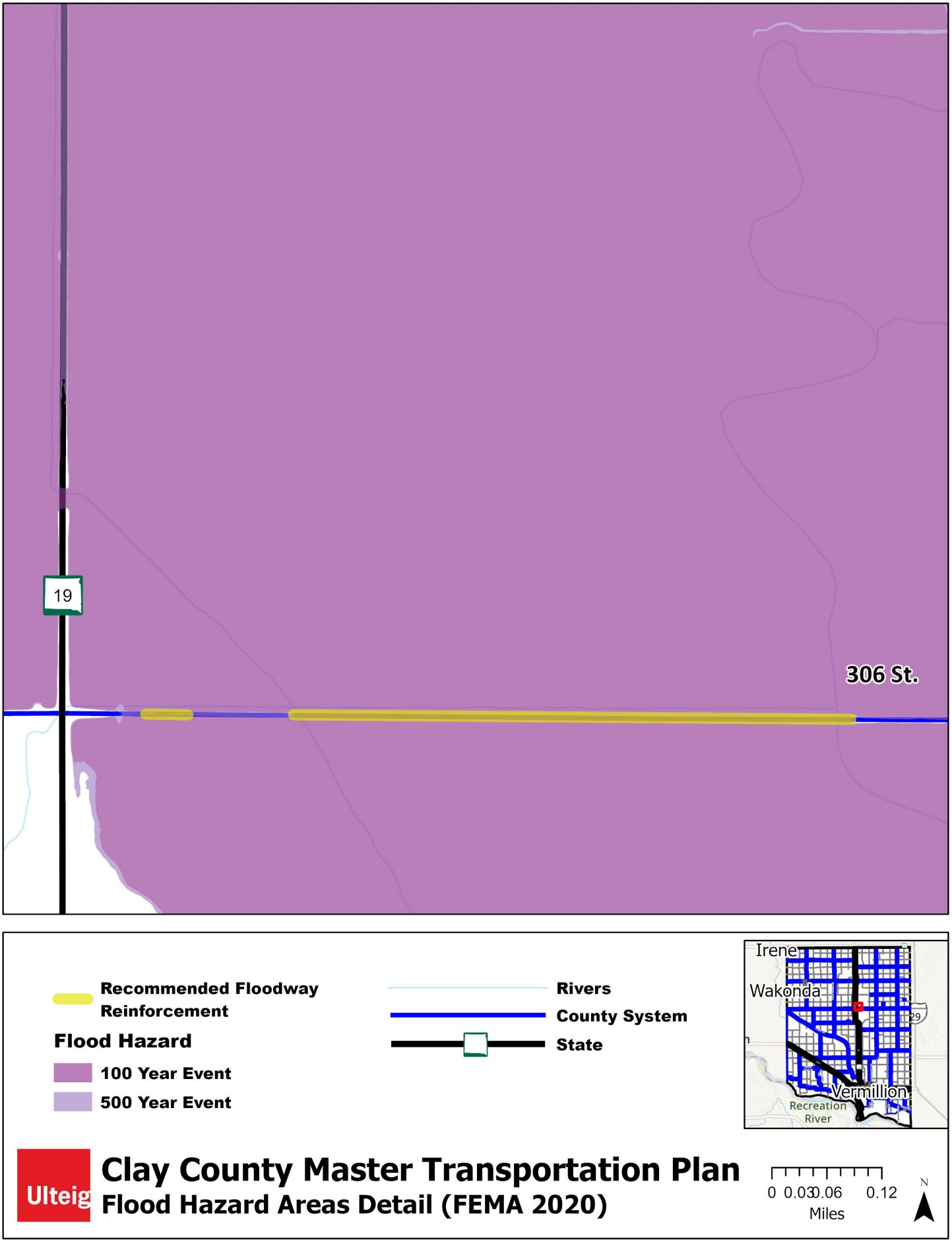

Figure 31: Flood Hazard Areas Detail (FEMA 2020)

Grade Raises

A grade raise is a design that builds up the elevation of the road so that high waters do not overtop the road and may include new bridge crossings. Grade raises are a permanent but expensive solution to frequently flooded paved or unpaved roads. Federal Emergency Management Agency funding may be available for projects that reduce or eliminate the risk of repetitive flood damage following an eligible disaster declaration.

Geomorphic Design of Floodplain Drainageways

Geomorphic design is a strategy to reduce flooding and infrastructure failure by adding floodplain culverts in lieu of expanding or increasing bridge culvert size. Minnesota Department of Natural Resources and Minnesota Department of Transportation are in partnership to deploy this approach in several locations. The approach does not make sense in all cases, depending on soil type, floodplain size, etc. However, using geomorphic design can increase waterway connectivity, design channel sedimentation, and reduce the risk of overtopping. Additional information is needed about its efficacy and the cost tradeoffs. Figure 32[43] below depicts a simplified example of the flood benefits of adding additional culverts along a river floodplain. This approach is recommended for higher priority routes such as state highways or interstates where a floodway type of design is incompatible but is an alternative for all road classes.

Other Considerations for Frequently Flooded Roads

If it is determined that mother nature is too much to overcome because of funding limitations, Clay County may pursue resolutions that change road maintenance designation to Minimum Maintenance, No Maintenance, or even abandonment of roads (road closure or road vacation) that frequently flood. This ultimately decreases connectivity of the network but may be preferrable to excessive cost and safety concerns.

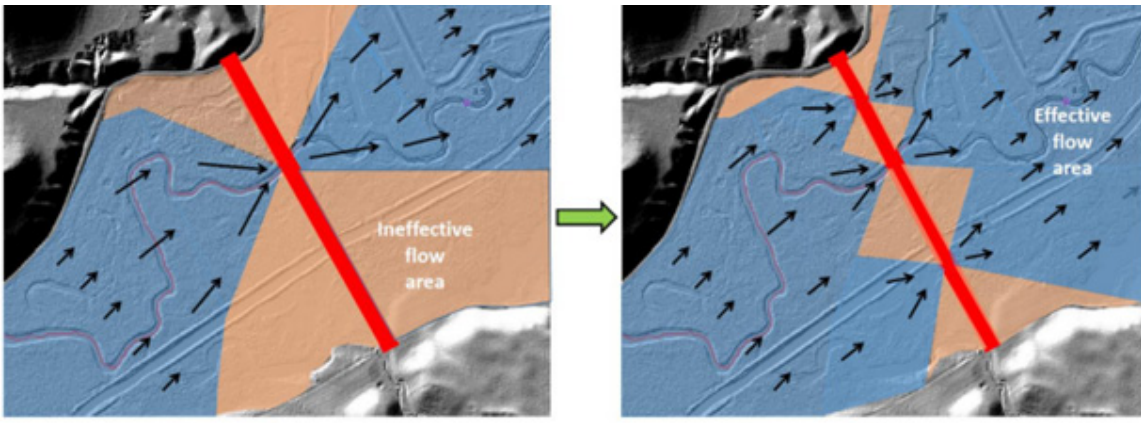

Figure 32. Geomorphic Approach to Floodplains

43 Figure 32. Zytkovicz, Kevin & Murtada, Salam. Reducing Localized Impacts to River Systems Through Proper Geomorphic Sizing of On-Channel and Floodplain Openings at Road/River Intersections (2013). Accessed through Minnesota Department of Transportation. Transportation Resilience: Current Practices and Opportunities for MnDOT (January 2020).

6. PROJECT IMPLEMENTATION

Existing road and bridge maintenance/improvements were ranked as top priorities for future funding by Clay County and the public survey results confirmed the priority is aligned. Therefore, project implementation first focuses on the road and bridge network. This approach has an overall goal of maintaining the condition of the network as a whole, extending useful life of each road and bridge.

With the above priority in focus, other enhancement projects are proposed that address issues and needs identified, prioritized as funding becomes available. Enhancement projects aim to supplement the core effort that is maintaining the existing infrastructure. These projects enhance, that is that they improve above and beyond what is considered essential to maintain. Project enhancements can take many forms. The projects proposed in this study generally fall into the same categories identified as issues, needs, challenges, and/or deficiencies. For example, if safety is the identified issue, then the proposed projects' outcome is to prevent future crashes, injuries, and fatalities that may unfortunately continue without action. If network discontinuity is the issue, then the projects' outcome is a modification to rebalance the network, cutting unnecessary costs. The same order of operations is followed for each of the issues identified. Many of the enhancement projects were identified early in the planning process as a result of special locations analysis found in Section 2.

Bridge Replacement Plan

Table 15 features the top prioritized bridges for replacement (all bridges in Poor or Fair Condition), sorted by corresponding BIG scores. The higher the BIG score, the more likely it will be awarded funding from the SDDOT BIG program, with up to 80% of the cost paid for this program. The evaluation process used in this section approximates the minimum BIG score expected, assuming eligibility for all bridges in Poor or Fair Condition, and up-to-date data inputs are available. Two additional factors have large impacts on scores and can increase the BIG score:

1. Bid Review Ready: 10 points are awarded if bridge rehabilitation or replacement projects are Bid Review Ready.
2. County Financial Commitment: Up to 10 points are awarded for county cost sharing of 20-50%, where a 20% cost share would earn 0 points, and a 50% cost share would earn 10 points.

As part of this study, the 21 bridges currently in Poor or Fair Condition have been identified as a priority for replacement, regardless of extenuating circumstances that may raise or reduce priority. However, the list may grow as bridges currently in Good Condition may also deteriorate to Fair Condition.

BRIDGE CLOSURE CONSIDERATIONS

If funding is not available to keep up the bridge replacement needs in Clay County, bridges may be considered for closure when the means to replace a bridge are no longer feasible. While this study does not formally recommend any bridges for closure, it is understood that the cost to repair bridges sometimes exceeds available funding. When deciding if a bridge must be closed, considerations should include daily traffic volume, detour length (Figure 33) and connectivity, project programming (funds dedicated), highway system, (primary, secondary, or township), functional classification, availability and acceptability of alternate routes, maintenance designation (full, minimum, or none) and cost.

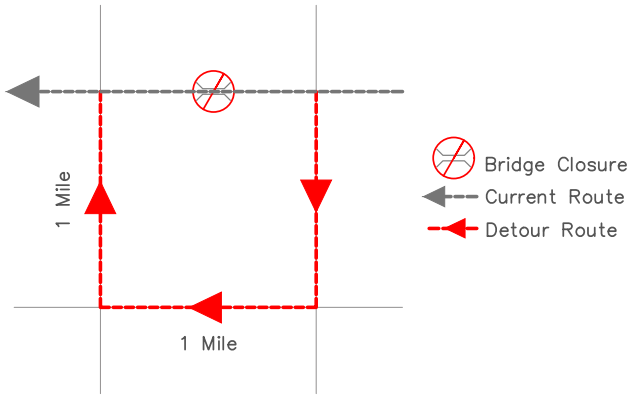

Figure 33. Bridge Detour Route Concept

Table 15: Prioritized Bridge Replacement Plan

Structure Number	Location	Year Built	Deck Area (SF)	Lowest Condition Rating (1-9)	Bridge Condition*	Posted for Load?	Fracture or Scour Critical?	ADT (veh/day)	Detour (mile)	Min. Estimated SDDOT BIG Score**	Programmed Cost in 5-Year Plan (2022 $)		
											Local $	BIG $	Total $
14-141-080	8.0 S & 14.1 E IRENE SD	1935	846	4	Poor	Yes	No	15	4	38.6			
14-150-006	0.6 S & 15.0 E IRENE	1960	1055	5	Fair	Yes	No	25	3	37.8			
14-140-160	7.0 S & 1.1 E OF HUB CITY	1925	551	4	Poor	Yes	No	15	10	35.5			
14-112-090	1.8 W HUB CITY	1970	4939	5	Fair	Yes	No	150	4	29.6	$ 80,000	$ 320,000	$ 400,000
14-030-180	18.0 S & 3.0 E IRENE SD	1938	803	5	Fair	Yes	No	25	2	21.5	$ 214,000	$ 856,000	$ 1,070,000
14-130-146	1.2 E & 6.0 N VERMILLION	1973	7335	4	Poor	No	Yes	297	2	16.6	$ 80,000	$ 320,000	$ 400,000
14-117-214	1.0 S VERMILLION	1975	9483	4	Poor	No	No	550	4	15.9			
14-125-120	3.0 S & 0.5 W HUB CITY	1981	4564	6	Fair	No	No	97	6	14.0			
14-088-160	0.8 N & 3.8 E MECKLING	1983	1765	4	Poor	No	No	125	2	12.3	$ 14,000	$ 56,000	$ 70,000
14-133-105	10.5 S & 13.3 E IRENE	1995	720	6	Fair	No	No	206	2	11.8			
14-074-050	4.4 E WAKONDA	1980	1776	6	Fair	No	No	232	5	11.3			
14-070-015	1.5 S & 7.0 E IRENE	1965	2744	6	Fair	No	No	95	3	11.0			
14-112-170	3.5 N & 0.8 W VERMILLION	1935	429	5	Fair	No	No	97	2	10.8			
14-103-090	2.8 W HUB CITY	1970	2184	5	Fair	No	No	150	4	10.6	$ 80,000	$ 320,000	$ 400,000
14-105-209	0.5 S & 0.5 W VERMILLION	1996	6829	6	Fair	No	No	700	1	10.5			
14-090-125	12.5 S 9.0 E IRENE SD	1930	645	5	Fair	No	No	25	2	10.5			
14-092-180	2.5 N & 2.9 W VERMILLION	1988	2416	6	Fair	No	No	35	4	9.3			
14-060-058	5.8 S & 6.0 E IRENE	2006	3050	6	Fair	No	No	31	4	9.2			
14-020-117	1.0 W & 6.7 S WAKONDA	1975	1827	6	Fair	No	No	5	6	8.3			
14-108-213	1.3 S JCT SD19 & 50	2000	9268	6	Fair	No	No	80	1	8.1			
14-133-150	1.6 E & 5.5 N VERMILLION	1985	5177	6	Fair	No	No	97	2	8.0			

* Bridges must be classified in Poor Condition to be eligible for rehabilitation or replacement BIG funding. Bridges in Good Condition are not shown. All data inputs are from most recent available NBI database.

** Minimum Estimated BIG Scores may vary from actual BIG score applications. Also, up to 20 additional points can be added ("Bid Review Ready" and 50% cost share). All structures in table are assumed to have eligibility.

Enhancement Project Implementation Plan

Enhancement projects are proposed that address issues and needs identified, prioritized as funding becomes available. First, these projects were screened for a purpose and need. That is, it was ensured that the proposed projects meet objectives that address the need(s). The project is therefore justified for the expense. See Table 16.

Next, the proposed projects are prioritized, as funding is not available to address all projects immediately. Clay County will need to consider funding mechanisms and phasing sequences to start and complete these projects. Although all proposed projects address important needs, new issues and priorities may present themselves over time. Funding for enhancement projects may also be lacking. For these reasons, the actual implementation of the projects may deviate from the list shown below.

The criteria used to prioritize the enhancement projects include importance, urgency, cost, benefits achieved, and the support observed during the public engagement and survey questionnaire. As a result, a list of enhancement projects has been sorted by project type and prioritized in the short (0-5 years), mid (6-10 years), or long term (11-20 years or more). It has been provided to consider as funding becomes available. This list is prioritized as of the present year (2022) and is subject to change over time as new issues arise and priorities change. However, this list is the product of a system-wide analysis and an assessment over the long term, 20+ years. It is not necessarily subject to the same short-term persuasions that often accompany spontaneous or outspoken planning efforts, and Clay County can use it as a reliable guide.

These cost estimates in 2022 dollars (2022 $) are planning level engineering/ construction estimates and should always be refined with future project development to incorporate more detailed assumptions. Cost will vary based on project scope, site conditions, site constraints, project schedule, inflation, and various economic pressures at the time of construction. Proposed enhancement projects are shown in Figure 34 and the corresponding Table 17. Table 18 describes a benefit assessment that each of the proposed enhancement projects may provide, either as positive, neutral, or negative impact in general terms.

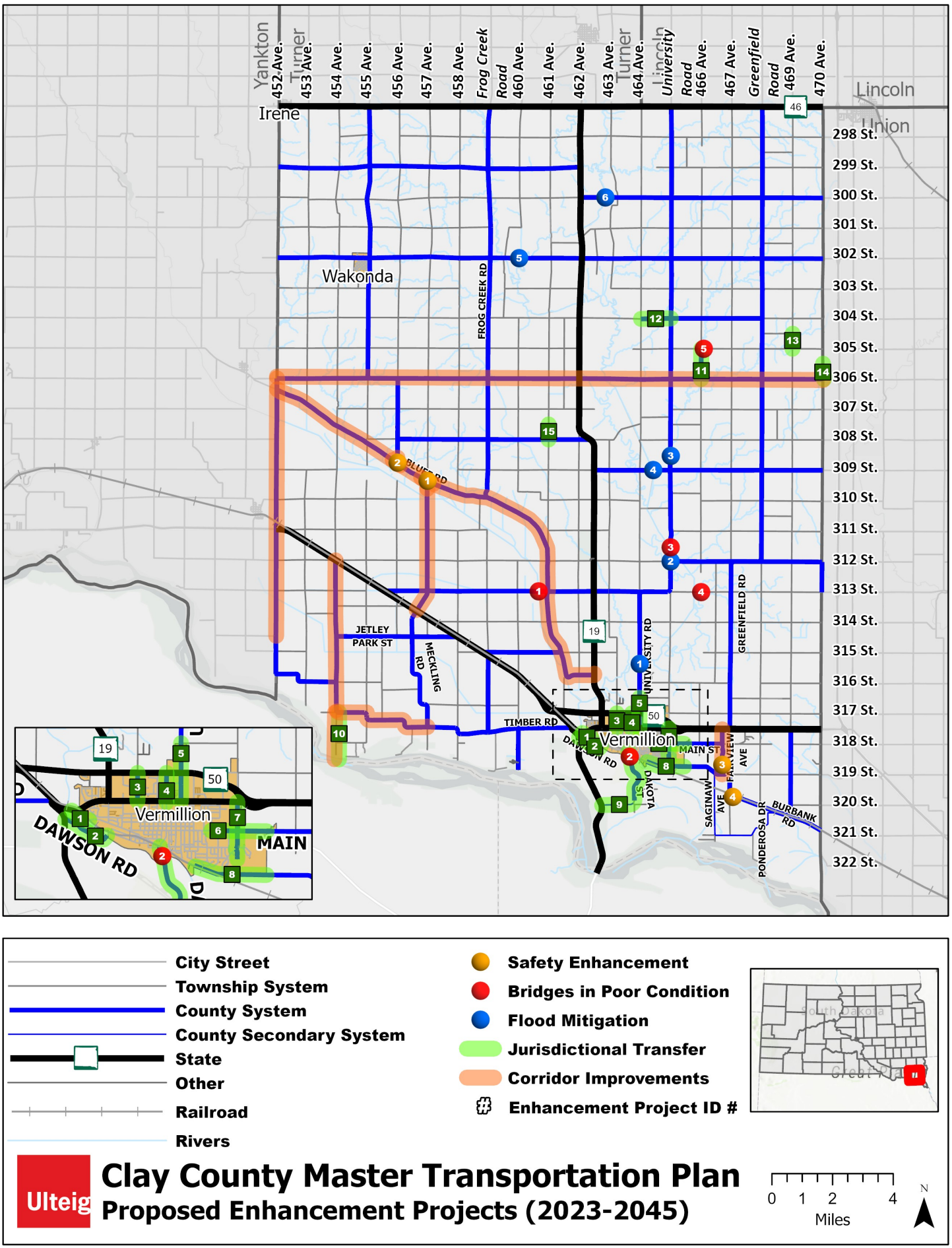

Figure 34: Proposed Enhancement Projects (2023-2045)

Table 16: Proposed Enhancement Projects (2023-2045) – Purpose and Need (1 of 2)

Enhancement Type	ID	Location	From	To	Length (mi)	Project Type	Owner	Purpose	Need	Priority * (S, M, L)
Flood Mitigation	1	University Rd	314 St	316 St	-	Flood Mitigation	Clay County	To improve flooding resiliency and maintain connectivity	Road facilities have flooding deficiencies; roads occasionally must be closed and flooding can permanently damage roads and drainage structures.	M
	2	Intersection of 312 St & University Rd	-	-	-	Flood Mitigation	Clay County	To improve flooding resiliency and maintain connectivity	Road facilities have flooding deficiencies; roads occasionally must be closed and flooding can permanently damage roads and drainage structures.	S
	3	University Rd	308 St	309 St	-	Flood Mitigation	Clay County	To improve flooding resiliency and maintain connectivity	Road facilities have flooding deficiencies; roads occasionally must be closed and flooding can permanently damage roads and drainage structures.	S
	4	309 St	464 Ave	University Rd	-	Flood Mitigation	Clay County	To improve flooding resiliency and maintain connectivity	Road facilities have flooding deficiencies; roads occasionally must be closed and flooding can permanently damage roads and drainage structures.	S
	5	302 St	460 Ave	461 Ave	-	Flood Mitigation	Clay County	To improve flooding deficiencies and maintain connectivity	Road facilities have flooding deficiencies; roads occasionally must be closed and flooding can permanently damage roads and drainage structures.	L
	6	300 St	SD 19	463 Ave	-	Flood Mitigation	Clay County	To improve flooding deficiencies and maintain connectivity	Road facilities have flooding deficiencies; roads occasionally must be closed and flooding can permanently damage roads and drainage structures.	L
Bridges in Poor Condition	1	313 St	460 Ave	461 Ave	-	Bridge Replacement	Clay County	To improve bridge deficiencies and maintain connectivity	Bridge facility in poor condition; bridge may be posted for load limits or closed.	M
	2	Dakota St	Chestnut St	0.2 mi South	-	Bridge Replacement	Clay County	To improve bridge deficiencies and maintain connectivity	Bridge facility in poor condition; bridge may be posted for load limits or closed.	L
	3	University Rd	311 St	312 St	-	Bridge Replacement	Clay County	To improve bridge deficiencies and maintain connectivity	Bridge facility in poor condition; bridge may be posted for load limits or closed.	S
	4	313 St	465 Ave	466 Ave	-	Bridge Replacement	Clay County	To improve bridge deficiencies and maintain connectivity	Bridge facility in poor condition; bridge may be posted for load limits or closed.	M
	5	305 St	466 Ave	467 Ave	-	Bridge Replacement	Clay County	To improve bridge deficiencies and maintain connectivity	Bridge facility in poor condition; bridge may be posted for load limits or closed.	M
Safety Enhancements	1	Intersection of Bluff Rd & 457 Ave	-	-	-	Safety Enhancement	Clay County	To improve safety	Intersection has conflicting right of way, unexpected traffic control, and skewed sightlines.	M
	2	Intersection of Bluff Rd & 456 Ave	-	-	-	Safety Enhancement	Clay County	To improve safety	Intersection has skewed sightlines.	M
	3	Fairview Ave Corridor	SD 50	Burbank Rd	1.5	Safety Enhancement	Clay County	To improve safety	Part of corridor has poor sightlines around trees and curves, and lacks optimum roadside safety devices in presence of steep terrain.	L
	4	Burbank Rd	467 Ave	0.25 mi east	0.3	Safety Enhancement	Clay County	To improve safety	Road segment had 8 severe crashes reported during reporting period, including 2 severe crashes, with 7 run-off-road type crashes.	S
Jurisdictional Transfers (continues on next page)	1	Main St	SD 19	2,170 ft east	0.4	Jurisdictional Transfer	Clay County	To improve county system linkage and connectivity	Road segment is not connected to county network, causing maintenance and operations inefficiencies.	M
	2	Dawson Rd	SD 19	4,550 ft east	0.9	Jurisdictional Transfer	Clay County	To improve county system linkage and connectivity	Road segment is not connected to county network, causing maintenance and operations inefficiencies.	M
	3	Princeton Ave	SD 50	SD 50 L/Cherry St	0.5	Jurisdictional Transfer	Clay County	To use strategic planning to improve county system consistency	Road segment is within Vermillion City limits and should be formally transferred to the City.	S

* S: Short-Term 1-5 Years
* M: Mid-Term 6-10 Years
* L: Long-Term 11-20 Years or More

Table 16: Proposed Enhancement Projects (2023-2045) – Purpose and Need (2 of 2)

Enhancement Type	ID	Location	From	To	Length (mi)	Project Type	Owner	Purpose	Need	Priority * (S, M, L)
Jurisdictional Transfers (continued from previous page)	4	Dakota St	SD 50	SD 50 L/Cherry St	0.5	Jurisdictional Transfer	Clay County	To use strategic planning to improve county system consistency	Road segment is within Vermillion City limits and should be formally transferred to the City.	S
	5	University St	Coyote St	SD 50 L/Cherry St	1.0	Jurisdictional Transfer	Clay County	To use strategic planning to improve future mobility and county system consistency	Part of road segment is within Vermillion City limits and should be formally transferred to the City. Suburban context may not be consistent with county design elements.	S
	6	Main St	Anderson St	5,140 ft east	1.0	Jurisdictional Transfer	Clay County	To use strategic planning to improve county system consistency	Road segment is within Vermillion City limits and should be formally transferred to the City.	S
	7	Crawford Rd/Pinehurst Ave	SD 50 L/Cherry St	970 ft south of Crawford Rd	1.0	Jurisdictional Transfer	Clay County	To use strategic planning to improve county system consistency	Road segment is within Vermillion City limits and should be formally transferred to the City.	S
	8	Burbank Rd	390 ft SE of Chestnut St	3,975 feet E of Crawford Rd	1.5	Jurisdictional Transfer	Clay County	To use strategic planning to improve future mobility and county system consistency	Suburban context may not be consistent with county design elements.	M
	9	Dakota St	Chestnut St	SD 19	2.9	Jurisdictional Transfer	Clay County	To improve county system linkage and connectivity	Road segment is not connected to county network, causing maintenance and operations inefficiencies.	M
	10	454 Ave	Timber Rd	Myron Grove River Access	1.5	Jurisdictional Transfer	Norway Township	To use strategic planning to improve mobility	Township road segment may operate more similarly to county road network.	M
	11	466 Ave	305 St	306 St	1.0	Jurisdictional Transfer	Clay County	To improve county system linkage and connectivity	Road segment is not well connected to county network, causing maintenance and operations inefficiencies.	L
	12	304 St	464 Ave	University Rd	1.0	Jurisdictional Transfer	Clay County	To improve county system linkage and connectivity	Road segment is not well connected to county network, causing maintenance and operations inefficiencies.	L
	13	469 St	Newdale St	305 St	0.5	Jurisdictional Transfer	Clay County	To improve county system linkage and connectivity	Road segment is not connected to county network, causing maintenance and operations inefficiencies.	L
	14	470 Ave	306 St	2,640 ft north	0.5	Jurisdictional Transfer	Clay County	To improve county system linkage and connectivity	Road segment is not well connected to county network, causing maintenance and operations inefficiencies.	L
	15	461 Ave	308 St	2,640 ft north	0.5	Jurisdictional Transfer	Clay County	To improve county system linkage and connectivity	Road segment is not well connected to county network, causing maintenance and operations inefficiencies.	L
Corridor Improvements	-	452 Ave Corridor	306 St	Union School Road	8.5	Corridor Improvements	Clay County	To improve mobility and facilitate economic growth	Road identified as "County Gravel" on Major Roads Plan, but long term design would feature treated gravel, blotter road, or asphalt.	L
	-	454 Ave Corridor	SD 50	Timber Rd	5.0	Corridor Improvements	Clay County	To improve safety	Road identified as "County Paved" on Major Roads Plan, with narrow driving surface.	L
	-	Timber Rd Corridor	454 Ave	Meckling Rd	3.3	Corridor Improvements	Clay County	To improve safety	Road identified as "County Paved" on Major Roads Plan, with narrow driving surface.	L
	-	457 Ave Corridor	Bluff Rd	SD 50	4.4	Corridor Improvements	Clay County	To improve mobility, safety, and facilitate economic growth	Road identified as "County Paved - Priority Route" on Major Roads Plan, with narrow driving surface and potential for on-road bike route.	L
	-	306 St Corridor	452 Ave	470 Ave	18.0	Corridor Improvements	Clay County	To improve mobility, safety, and facilitate economic growth	Road identified as "County Paved - Priority Route" on Major Roads Plan, with narrow driving surface and potential for on-road bike route.	L
	-	Bluff Rd Corridor	452 Ave	SD 19	15.9	Corridor Improvements	Clay County	To improve mobility, safety, and facilitate economic growth	Road identified as "County Paved - Priority Route" on Major Roads Plan, with narrow driving surface and potential for on-road bike route.	L

* S: Short-Term 1-5 Years
* M: Mid-Term 6-10 Years
* L: Long-Term 11-20 Years or More

Table 17: Proposed Enhancement Projects (2023-2045) – Description and Priority (1 of 2)

Enhancement Type	ID	Location	From	To	Length (mi)	Project Type	Owner	Description	Priority * (S, M, L)	Est Cost (2022 $)
Flood Mitigation**	1	University Rd	314 St	316 St	-	Flood Mitigation	Clay County	Roadway location is known to flood at a moderate flood stage. For planning purposes, potential flood mitigation includes floodway treatment to reinforce roadway shoulders, as it may not be feasible to make expensive long term improvements.	M	$ 150,000
	2	Intersection of 312 St & University Rd	-	-	-	Flood Mitigation	Clay County	Roadway location is known to flood at a minor flood stage. For planning purposes, potential flood mitigation includes floodway treatment to reinforce roadway shoulders, as it may not be feasible to make expensive long term improvements.	S	$ 150,000
	3	University Rd	308 St	309 St	-	Flood Mitigation	Clay County	Roadway location is known to flood at a minor flood stage. For planning purposes, potential flood mitigation includes floodway treatment to reinforce roadway shoulders, as it may not be feasible to make expensive long term improvements.	S	$ 150,000
	4	309 St	464 Ave	University Rd	-	Flood Mitigation	Clay County	Roadway location is known to flood at a minor flood stage. For planning purposes, potential flood mitigation includes floodway treatment to reinforce roadway shoulders, as it may not be feasible to make expensive long term improvements.	S	$ 150,000
	5	302 St	460 Ave	461 Ave	-	Flood Mitigation	Clay County	Roadway location is known to flood at a minor flood stage. Potential flood mitigation includes a grade raise and additional culverts, but existing bridge (Good Condition) may need replacement to accommodate. Cost assumes Bridge Replacement, but cost of this project can vary greatly.	L	$ 3,500,000
	6	300 St	SD 19	463 Ave	-	Flood Mitigation	Clay County	Roadway location is known to flood at a minor flood stage. Potential flood mitigation includes a grade raise and additional culverts, but existing bridge (Good Condition) may need replacement to accommodate. Cost assumes Bridge Replacement, but cost of this project can vary greatly.	L	$ 3,500,000
Bridges in Poor Condition	1	313 St	460 Ave	461 Ave	-	Bridge Replacement	Clay County	This bridge (14-088-160) is currently in Poor Condition (structurally deficient) and is identified as one of the top priorities for replacement as part of the Bridge Replacement Plan.	M	$ 1,000,000
	2	Dakota St	Chestnut St	0.2 mi South	-	Bridge Replacement	Clay County	This bridge (14-117-214) is currently in Poor Condition (structurally deficient) and is identified as one of the top priorities for replacement as part of the Bridge Replacement Plan.	L	$ 5,000,000
	3	University Rd	311 St	312 St	-	Bridge Replacement	Clay County	This bridge (14-130-146) is currently in Poor Condition (structurally deficient)and is identified as one of the top priorities for replacement as part of the Bridge Replacement Plan. There is a bridge deck rehabilitation planned in 2023 with estimated cost of $400,000.	S	$ 400,000
	4	313 St	465 Ave	466 Ave	-	Bridge Replacement	Clay County	This bridge (14-140-160) is currently in Poor Condition (structurally deficient) and is identified as one of the top priorities for replacement as part of the Bridge Replacement Plan.	M	$ 1,000,000
	5	305 St	466 Ave	467 Ave	-	Bridge Replacement	Clay County	This bridge (14-141-080) is currently in Poor Condition (structurally deficient) and is identified as one of the top priorities for replacement as part of the Bridge Replacement Plan.	M	$ 1,000,000
Safety Enhancements	1	Intersection of Bluff Rd and 457 Ave	-	-	-	Safety Enhancement	Clay County	Reconstruct intersection to remove conflicting right of way, replace unexpected traffic control, and improve skewed sightlines (multiple geometric alternatives).	M	$ 150,000
	2	Intersection of Bluff Rd and 456 Ave	-	-	-	Safety Enhancement	Clay County	Reconstruct intersection to improve skewed sightlines with 3-Way "T" intersection. Cost assumes regrading mainline would be required.	M	$ 200,000
	3	Fairview Ave Corridor	SD 50	Burbank Rd	1.5	Safety Enhancement	Clay County	Clear trees around curves, stabilize inslopes, and construct guardrail in areas with non-traversable inslopes on this corridor. Cost assumes gravel road is converted to asphalt.	L	$ 1,000,000
	4	Burbank Rd	467 Ave	0.25 mi east	0.3	Safety Enhancement	Clay County	Crash treatments for vehicles that run off road include wider shoulders, slope flattening, rumble stripes, lighting, and high friction safety treatment. Cost assumes shoulder widening.	S	$ 150,000
Jurisdictional Transfers (continues on next page)	1	Main St	SD 19	2,170 ft east	0.4	Juridictional Transfer	Clay County	Not connected to county network. Begin conversations with City of Vermillion. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	M	$ -
	2	Dawson Rd	SD 19	4,550 ft east	0.9	Juridictional Transfer	Clay County	Not connected to county network. Begin conversations with City of Vermillion. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	M	$ -
	3	Princeton Ave	SD 50	SD 50 L/Cherry St	0.5	Juridictional Transfer	Clay County	Within Vermillion City Limits. Begin conversations with City of Vermillion. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	S	$ -

* S: Short-Term 1-5 Years

* M: Mid-Term 6-10 Years

* L: Long-Term 11-20 Years or More

** Hydraulic or feasibility study is recommended for all flood mitigation projects.

Table 17: Proposed Enhancement Projects (2023-2045) – Description and Priority (2 of 2)

Enhancement Type	ID	Location	From	To	Length (mi)	Project Type	Owner	Description	Priority * (S, M, L)	Est Cost (2022 $)
Jurisdictional Transfers (continued from previous page)	4	Dakota St	SD 50	SD 50 L/Cherry St	1.0	Juridictional Transfer	Clay County	Within Vermillion City Limits. Begin conversations with City of Vermillion. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	S	$ -
	5	University St	Coyote St	SD 50 L/Cherry St	1.3	Juridictional Transfer	Clay County	Within and adjacent to Vermillion City Limits. Begin conversations with City of Vermillion. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	M	$ -
	6	Main St	Anderson St	5,140 ft east	1.0	Juridictional Transfer	Clay County	Within Vermillion City Limits. Begin conversations with City of Vermillion. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	S	$ -
	7	Crawford Rd/Pinehurst Ave	SD 50 L/Cherry St	970 ft south of Crawford Rd	1.0	Juridictional Transfer	Clay County	Within Vermillion City Limits. Begin conversations with City of Vermillion. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	S	$ -
	8	Burbank Rd	390 ft SE of Chestnut St	3,975 ft E of Crawford Rd	1.5	Juridictional Transfer	Clay County	Adjacent to Vermillion City Limits. Begin conversations with City of Vermillion. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	M	$ -
	9	Dakota St	Chestnut St	SD 19	2.9	Juridictional Transfer	Clay County	Not connected to county network. Begin conversations with City of Vermillion. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	M	$ -
	10	454 Ave	Timber Rd	Myron Grove River Access	1.5	Juridictional Transfer	Norway Township	Candidate for transfer to County Network. Begin conversations with Norway Township. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	M	$ -
	11	466 Ave	305 St	306 St	1.0	Juridictional Transfer	Clay County	Not connected to county network. Begin conversations with Garfield Township. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	L	$ -
	12	304 St	464 Ave	University Rd	1.0	Juridictional Transfer	Clay County	Not connected to county network. Begin conversations with Garfield Township. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	L	$ -
	13	469 Ave	Newdale St	305 St	0.5	Juridictional Transfer	Clay County	Not connected to county network. Begin conversations with Garfield Township. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	L	$ -
	14	470 Ave	306 St	2,640 ft north	0.5	Juridictional Transfer	Clay County	Not connected to county network. Begin conversations with Garfield Township. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	L	$ -
	15	461 Ave	308 St	2,640 ft north	0.5	Juridictional Transfer	Clay County	Not connected to county network. Begin conversations with Pleasant Valley Township. When ready, draft agreement (Memorandum of Understanding). Cost is unknown.	L	$ -
Corridor Improvements		452 Ave Corridor	306 St	Union School Rd	8.5	Corridor Improvements	Clay County	Identified as "County Gravel" on Major Roads Plan and experiences heavy vehicles. Long term design would feature treated gravel, blotter road, or asphalt with 2' wide shoulders when funding becomes available. Cost assumes gravel road is reconstructed to asphalt and bridge to remain. Other conversion treatments with surface preparation are estimated to be about 1/5 to 1/3 of the estimated cost shown.	L	$ 6,000,000
		454 Ave Corridor	SD 50	Timber Rd	5.0	Corridor Improvements	Clay County	Identified as "County Paved" on Major Roads Plan, and has narrow driving surface. Long term design would feature 2' wide shoulders when funding becomes available.	L	$ 1,750,000
		Timber Rd Corridor	454 Ave	Meckling Rd	3.3	Corridor Improvements	Clay County	Identified as "County Paved" on Major Roads Plan, and has narrow driving surface and steep inslopes. Long term design would feature 2' wide shoulders when funding becomes available.	L	$ 1,500,000
		457 Ave Corridor	Bluff Rd	SD 50	4.4	Corridor Improvements	Clay County	Identified as "County Paved - Priority Route" on Major Roads Plan, with potential for on-road bike route, and has narrow driving surface and narrow structure parapets. Long term design would feature 2'-8' wide shoulders when funding becomes available.	L	$ 3,000,000
		306 St Corridor	452 Ave	470 Ave	18.0	Corridor Improvements	Clay County	Identified as "County Paved - Priority Route" on Major Roads Plan, with potential for on-road bike route, and has narrow driving surface. Long term design would feature 2'-8' wide shoulders when funding becomes available.	L	$ 9,000,000
		Blufff Rd Corridor	452 Ave	SD 19	15.9	Corridor Improvements	Clay County	Identified as "County Paved - Priority Route" or "County Paved" on Major Roads Plan, and has narrow driving surface and narrow structure parapets. Long term design would feature 2'-8' wide shoulders when funding becomes available.	L	$ 8,000,000

* S: Short-Term 1-5 Years

* M: Mid-Term 6-10 Years

* L: Long-Term 11-20 Years or More

** Hydraulic or feasibility study is recommended for all flood mitigation projects.

Table 18: Proposed Enhancement Projects (2023-2045) – Impact Assessment

Enhancement Type	ID	Location	From	To	Length (mi)	Project Type	Benefit Assessment* (+) N (-)					
							Economic	Quality of Life	Delay Reduction	Cost	Public Health	Environment
Flood Mitigation	1	University Rd	314 St	316 St	-	Flood Mitigation	(+)	(+)	(+)	(N)	N	(+)
	2	Intersection of 312 St & University Rd	-	-	-	Flood Mitigation	(+)	(+)	(+)	(N)	N	(+)
	3	University Rd	308 St	309 St	-	Flood Mitigation	(+)	(+)	(+)	(N)	N	(+)
	4	309 St	464 Ave	University Rd	-	Flood Mitigation	(+)	(+)	(+)	(N)	N	(+)
	5	302 St	460 Ave	461 Ave	-	Flood Mitigation	(+)	(+)	(+)	(-)	(+)	N
	6	300 St	SD 19	463 Ave	-	Flood Mitigation	(+)	(+)	(+)	(-)	(+)	N
Bridges in Poor Condition	1	313 St	460 Ave	461 ave	-	Bridge Replacement	(+)	(+)	(+)	(-)	N	N
	2	Dakota St	Chestnut St	0.2 mi South	-	Bridge Replacement	(+)	(+)	(+)	(-)	N	N
	3	University Rd	311 St	312 St	-	Bridge Replacement	(+)	(+)	(+)	(-)	N	N
	4	313 St	465 Ave	466 Ave	-	Bridge Replacement	(+)	(+)	(+)	(-)	N	N
	5	305 St	466 Ave	467 Ave	-	Bridge Replacement	(+)	(+)	(+)	(-)	N	N
Safety Enhancements	1	Intersection of Bluff Rd and 457 Ave	-	-	-	Safety Enhancement	N	N	N	(-)	(+)	N
	2	Intersection of Bluff Rd and 456 Ave	-	-	-	Safety Enhancement	N	N	N	(-)	(+)	N
	3	Fairview Ave Corridor (SD 50 to Burbank Rd)	SD 50	Burbank Rd	1.5	Safety Enhancement	N	N	N	(-)	(+)	N
	4	Burbank Rd	467 Ave	0.25 mi east	0.3	Safety Enhancement	N	N	N	(-)	(+)	N
Jurisdictional Transfers	1	Main St	SD 19	2,170 ft east	0.4	Jurisdictional Transfer	N	N	N	N	N	N
	2	Dawson Rd	SD 19	4,550 ft east	0.9	Jurisdictional Transfer	N	N	N	N	N	N
	3	Princeton St	SD 50	SD 50 L/Cherry St	0.5	Jurisdictional Transfer	N	N	N	N	N	N
	4	Dakota St	SD 50	SD 50 L/Cherry St	0.5	Jurisdictional Transfer	N	N	N	N	N	N
	5	University St	Coyote St	SD 50 L/Cherry St	1.0	Jurisdictional Transfer	N	N	N	N	N	N
	6	Main St	Anderson St	5,140 ft east	1.0	Jurisdictional Transfer	N	N	N	N	N	N
	7	Crawford Rd/Pinehurst Ave	SD 50 L/Cherry St	970 ft south of Crawford Rd	1.0	Jurisdictional Transfer	N	N	N	N	N	N
	8	Burbank Rd	390 ft SE of Chestnut St	3,975 ft E of Crawford Rd	1.5	Jurisdictional Transfer	N	N	N	N	N	N
	9	Dakota St	Chestnut St	SD 19	2.9	Jurisdictional Transfer	N	N	N	N	N	N
	10	454 Ave	Timber Rd	Myron Grove River Access	1.5	Jurisdictional Transfer	N	N	N	N	N	N
	11	466 Ave	305 St	306 St	1.0	Jurisdictional Transfer	N	N	N	N	N	N
	12	304 St	464 Ave	University Rd	1.0	Jurisdictional Transfer	N	N	N	N	N	N
	13	469 St	Newdale St	305 St	0.5	Jurisdictional Transfer	N	N	N	N	N	N
	14	470 Ave	306 St	2,640 ft north	0.5	Jurisdictional Transfer	N	N	N	N	N	N
	15	461 Ave	308 St	2,640 ft north	0.5	Jurisdictional Transfer	N	N	N	N	N	N
Corridor Improvements		452 Ave Corridor	306 St	Union School Rd	8.5	Corrdior Improvements	(+)	(+)	N	(-)	N	N
		454 Ave Corridor	SD 50	Timber Rd	5.0	Corrdior Improvements	N	N	N	(-)	(+)	N
		Timber Rd Corridor	454 Ave	Meckling Rd	3.3	Corrdior Improvements	N	N	N	(-)	(+)	N
		457 Ave Corridor	Bluff Rd	SD 50	4.4	Corrdior Improvements	(+)	N	N	(-)	(+)	N
		306 St Corridor	452 Ave	470 Ave	18.0	Corrdior Improvements	(+)	N	N	(-)	(+)	N
		Bluff Rd Corridor	453 Ave	SD 19	15.9	Corrdior Improvements	(+)	N	N	(-)	(+)	N

* (+): Positive Benefits Impact
* N: Neutral Benefits Impact
* (-): Negative Benefits Impact

7. CONCLUSIONS AND RECOMMENDATIONS

ISSUES AND NEEDS IDENTIFIED

A list of issues and needs were identified according to the baseline conditions analysis, discussions with the SAT, and public feedback. This list forms the basis for the plan recommendations, including new standards, guidelines, and future project implementation.

Clay County's primary issues and needs are as follows:

- Bridge Replacement
- Road Conditions
- Road Geometry and Safety
- Flooded Roads
- Demand for Bicycle and Pedestrian Infrastructure
- Urban Growth and Development
- Jurisdictional Ownership
- Prioritizing Improvements with Available Funding

SEEING INTO THE FUTURE

The primary issues and needs identified as part of the baseline conditions analysis for Clay County are all issues that are readily apparent in their present form. They are expected to remain issues in the near future and could all conceivably worsen over time. How each of these issues interact with each other and their prominence in the minds of the public over time is undetermined. It should also be noted that other seemingly less urgent issues, needs, challenges, and/or deficiencies were also identified such as, but not limited to, suburban traffic capacity limitations, aging demographics, lack of available transit, and future needs for electrical infrastructure to support electric vehicles.

This study uses the year 2045 as the planning horizon. However, needs and priorities are expected to change over time, so this document is considered a "living document." It is recommended that Clay County intermittently assess the trends of these issues and identify new issues as appropriate. Intermittent updates to long range transportation plans such as this MTP in increments of five or more years will be of great benefit to Clay County in this regard, but also to help promote and take advantage of new technology and innovation that will conceivably cut long-term costs and promote industry and economic growth. It is recommended to maintain this document by performing an update to this study every 5 to 10 years to keep it current and beneficial to the County.

SUMMARY OF STANDARDS AND GUIDELINES DEVELOPED

The next step in the study was to address identified issues and needs in the form of standards and guidelines development and project planning. The standards and guidelines developed by this study in Section 5 of this report help guide the process of implementing planned improvements. Specifically, standards and guidelines help address issues and needs when it comes time to design projects and plan funding and responsibility. The standards and guidelines provided as part of this study will substantially help guide the County with future decision-making, helping to answer questions such as:

- Which roads and bridges have the highest priority for funding?
- Which roads can be part of a future connected bike route?
- How wide does a bridge need to be on certain types of roads?
- Where should new driveways and intersections be allowed on a county highway?
- What is an acceptable level of traffic delay due to increased traffic demand?
- When should a gravel road be paved?
- When and how should the County plan to transfer jurisdiction to the state, city, or township?
- Should the County consider changing a road to minimum maintenance designation?

As part of this study, a Major Roads Plan was developed for Clay County that classifies roads based on priorities and objectives into five classifications:

- County Paved – Priority Route
- County Paved
- County Gravel
- Local Roads
- Urban Roads

When constructing new roads or reconstructing existing roads, modern design standards should be used. Cross section designs for each of the road classifications have been provided and can be found in the Major Roads Plan (Urban Roads are recommended to transfer jurisdiction and do not have cross section design provided). In particular, the wider shoulders recommended for County Paved – Priority Routes will have multiple benefits to drivers and other users, especially safety. For drivers, wider shoulders provide better sight distance to the roadside and around horizontal curves, additional space for emergency parking, evasive maneuvers, maintenance and mail operations, and other benefits. For cyclists, it provides space to bike outside of the driving lane, which is why it can also be designated as bike route.

Additionally, standards and guidelines are provided as part of this study, which will help guide the County so that the Highway Department can plan improvements, funding, and cooperation for the road infrastructure:

- Functional Classification
- Base Typical Cross Section and Bridge Width Standards
- Level of Service Standards
- Access Management Access-Location Criteria
- Surface Type Change Policy Guidelines
- Jurisdictional Transfer
    - Candidate roads identified
    - Process guidance
    - Legal agreement template
- Changing Maintenance Designation Guidelines

SUMMARY OF PRIORITY INVESTMENTS AND RECOMMENDATIONS

County Highways

The number one project type prioritized by the public in the public survey was existing road maintenance and improvement. For the first time in 2022, Clay County developed a 5-Year Highway and Bridge Improvement Plan, which plans gravel and paving improvements through 2027. By renewing this plan each year, the County can continue to plan out highway improvement investments. With current issues in the construction industry such as labor shortages, supply chain disruptions, cost of construction materials, and interference with project schedules, inflation is high. Cost estimates should always be refined with future project development to incorporate more detailed assumptions. Cost will vary based on project scope, site conditions, site constraints, project schedule, and various economic pressures at the time of construction. See Section 5 of this report for road maintenance strategies.

County Bridges

At current funding levels, Clay County faces a difficult challenge to maintain all bridges in a state of good repair, as bridges often deteriorate at a faster rate than they can be repaired or replaced. Of 75 bridges, five are in Poor Condition (7%) and have short or unknown remaining service lives. Additionally, 10 bridges are already closed (13%). As part of this study, the 21 bridges currently in Poor or Fair Condition have been identified as a priority for replacement, regardless of extenuating circumstances that may raise or reduce priority. However, the list may grow as bridges currently in Good Condition may also deteriorate to Fair Condition. The County should also review bridge maintenance practices to ensure they align with modern and cost-effective techniques to get the most service life out of its bridges. See Section 5 of this report for bridge maintenance strategies and Section 6 for the Bridge Replacement Plan.

It is recommended that Clay County begin to apply for BIG funding with its new eligibility, as it is the most effective way to get funding for bridge replacement. It is also believed that the $1.2 trillion infrastructure bill will help with the replacement of existing bridges, but to what extent is currently unknown.

Enhancement Projects

Future projects with specific solutions that address identified issues and needs have been proposed and prioritized in the short, mid, or long term as funding becomes available. Many of these projects directly address special road segments and/or spot locations identified in early discussions with the Clay County Highway Department. It is hoped that one of the major outcomes of this study is that proposed projects will specifically address safety concerns in Clay County, as even just one life saved as a result of this plan would be a great return for the people of Clay County. See Section 6 of this report for the Enhancement Project Implementation Plan.

Bicycle and Pedestrian Plan

An exciting feature of this study is the proposal for a Bicycle and Pedestrian Plan and a Trails Master Plan (Section 5 of this report). There is great potential for trails and on-street bike routes to connect communities in Clay County. In particular, it is recommended to add paved shoulders to go with a Bike Route designation for the County Paved – Priority Routes, connecting all the major cities and towns in Clay County. To complete this as part of the Major Roads Plan, 4- to 8-foot paved shoulders would be constructed over time.

A conceptual but comprehensive Trails Master Plan has also been created as a vision for active transportation in Clay County, with great economic and health benefits for a fully realized countywide trails system. This network of trails would benefit Clay County for generations through increased physical activity options, quality of life, tourism, economic development, connectivity, and resiliency. The County will need to consider funding mechanisms and phasing sequences to start and complete these projects. A separate Clay County Trails Implementation plan or study is recommended.

Other Recommendations

- Use the standards and guidelines provided in this study to manage the impacts of new development by planning improvements, funding, and cooperation for new road infrastructure near new development, as well as when constructing new roads or reconstructing existing roads.
- As of 2022, Clay County imposes a wheel tax of $4.00 per wheel on all motor vehicles registered in Clay County, with a maximum of $16.00 per vehicle. This Wheel Tax earns Clay County 8 points in terms of the SDDOT BIG application. Potentially, an increase to the maximum of $5.00 per wheel could earn Clay County 10 points towards BIG applications, which would be one strategy to increase revenue for transportation improvements. In comparison to all adjacent counties, Clay County has the lowest per/vehicle wheel tax in the area and should also consider raising the maximum wheel tax per vehicle to increase revenue for transportation improvements.
- Continue and begin proactive discussions about jurisdictional transfer with nearby municipalities and developers on their intentions for future road jurisdiction and annexation. This will establish a firm direction early in the development process.
- There are some roads under Clay County jurisdiction within the city limits of Vermillion. These roads already have urban cross section design according to the needs of the City. It is recommended that all of these urban roads are jurisdictionally transferred to the City of Vermillion. It is understood the jurisdictional transfer process has recently begun for most, if not all of these locations.
- Change functional classification of 452 Ave (306 St to SD 50) from Local Road to Rural Major Collector
- Consider allocating funding contributions in support of local transit facilities, which would help serve the demand for transit in Clay County, particularly for the transit-dependent population in greater Clay County.
- Consider utilizing Performance-Based Practical Design (PBPD), though the SDDOT has not officially supported this practice. Those referring to this MTP should check to see if the SDDOT has provided any updated guidance on this topic, as it would be a valuable guide for use by county highway departments.

Other Recommendations Con't

- Track and consider emerging technology to meet mobility needs, including real-time traveler information, electric vehicle charging stations, ridesharing transportation network companies (such as Uber and Lyft), autonomous vehicles, connected vehicles, traffic management solutions, and pedestrian activated flashing crossings.
- Consider creating new policies, design guidelines, and standards as necessary to comply with ADA requirements as the County begins to implement pedestrian-friendly infrastructure.
- Intermittently improve all railroad crossings (system-wide) to help address the random nature of crashes at low-volume crossings.
- Implement risk mitigation strategies for motorcyclists along high-speed corridors.
- Clay County is strongly encouraged to consider widespread implementation of FHWA's Proven Safety Countermeasures (PSCs) to improve safety. In 2021, nine new PSCs were added to the growing list, and there are now a total of 28 different PSCs, addressing a variety of crash types and focus areas such as speed management, roadway departure, intersection, pedestrian, and bicyclist crashes.
- Invest in regular pavement condition assessments every two years in order to better understand how road conditions are tracking over time and how roads respond to different types of maintenance/rehab applications.
- Maintain this document by performing an update to this study every 5 to 10 years to keep it current and beneficial to the County.

TAX REVENUE OPTIONS

An increase in wheel tax could bring more revenue and add points for Bridge Improvement Grant (BIG) applications for bridge improvements, however this wheel tax increase would have to be approved by voters. Voters and/or elected officials may also have to approve and create a funding and maintenance mechanism to begin to implement the Clay County Trails Master Plan outlined within this study.

GRANT OPPORTUNITIES

This study, and its associated recommendations, sets Clay County up to be more competitive in grant application processes and pursuits, as recommended projects shown in this plan have already gained community buy-in and prioritization. Grants, such as the BIG grants, are opportunities for Clay County to pursue bridge replacements, and there are other grant opportunities available. Strategies for grant applications and some specific grant opportunities are listed in Section 5 of this report.

CUTTING EXPENSES

This study presents recommendations with an understanding that funding is limited. There are options to increase funding by raising money directly and applying for grants, though cutting expenses is an alternative that can be controlled to a greater extent. Some of the options directly presented in this study include being more proactive with jurisdictional transfer, exploring options for frequently flooded roads, and prioritizing bridges for replacement. Additionally, utilizing modern strategies for road and bridge maintenance will offer the greatest return on investment over the long term. Preventative maintenance strategies at the right time will return more longevity in the service lives of roads and bridges.

APPENDIX A
METHODS AND ASSUMPTIONS

METHODS & ASSUMPTIONS FOR THE CLAY COUNTY MASTER TRANSPORTATION PLAN

Prepared for Clay County, SDDOT & FHWA // Prepared by Ulteig Engineers, Inc.
December 20, 2021

Methods and Assumptions Meeting
October 26, 2021

Clay County

SD DOT

U.S. Department of Transportation
Federal Highway Administration

Ulteig
We listen. We solve.™

STAKEHOLDER ACCEPTANCE

The undersigned parties concur with the Methods and Assumptions for the Clay County Master Transportation Plan as presented in this document.

SDDOT:

Signature

Planning Engineer
Title

1/05/22
Date

Clay County:

Signature

Supervisor Chair
Title

12/20/21
Date

FHWA:

The South Dakota Division of FHWA has relinquished oversight of this study to SDDOT.

(1) Participation on the Study Advisory Team and/or signing of this document does not constitute approval of the Clay County Master Transportation Plan's Final Report or conclusions.

(2) All members of the Study Advisory Team will accept this document as a guide and reference as the study progresses through the various stages of development. If there are any agreed upon changes to the assumptions in this document a revision will be created, endorsed and signed by all the signatories.

TABLE OF CONTENTS

1. INTRODUCTION AND PROJECT DESCRIPTION

A. Background Information

Clay County is near the southeastern corner of South Dakota, situated north of the Missouri River. It is bordered by Nebraska to the south, Yankton County to the west, Turner County and Lincoln County to the north, and Union County to the east. The county of 417 square miles is characterized by rich farmland. Most of the population lives in Vermillion, which is over 5000 and considered urban by FHWA, Vermillion is also the home of the University of South Dakota. The 2020 county population was 14,967 (*US Census Bureau*), including the City of Vermillion, City of Irene, and the City of Wakonda. Clay County Townships include: Bethel, Fairview, Garfield, Glenwood, Meckling, Norway, Pleasant Valley, Prairie Center, Riverside, Spirit Mound, Star, and Vermillion. Clay County also has unincorporated communities of Alsen, Burbank, Dalesburg, Greenfield, Hub City, Meckling, and Westreville.

Clay County's roadway system is mostly consistent with a one square mile grid pattern, served by State, County, City, and Township owned roadways. The primary thoroughfares are SD Highway 50 (4 lanes, east-west) and SD Highway 19 (2 lanes, north-south), both of which flow through Vermillion.

Clay County is responsible for upkeep of approximately 236.4 miles (186.4 miles paved, 49.8 miles unpaved) of the 844 miles of roadways in the county, as well as 75 bridges on both county and township roads and a number of railroad crossings.

B. Location

The study area is Clay County and all communities and surface transportation infrastructure there within. The focus of the Clay County Master Transportation Plan will be county-owned and maintained roadways and bridges.

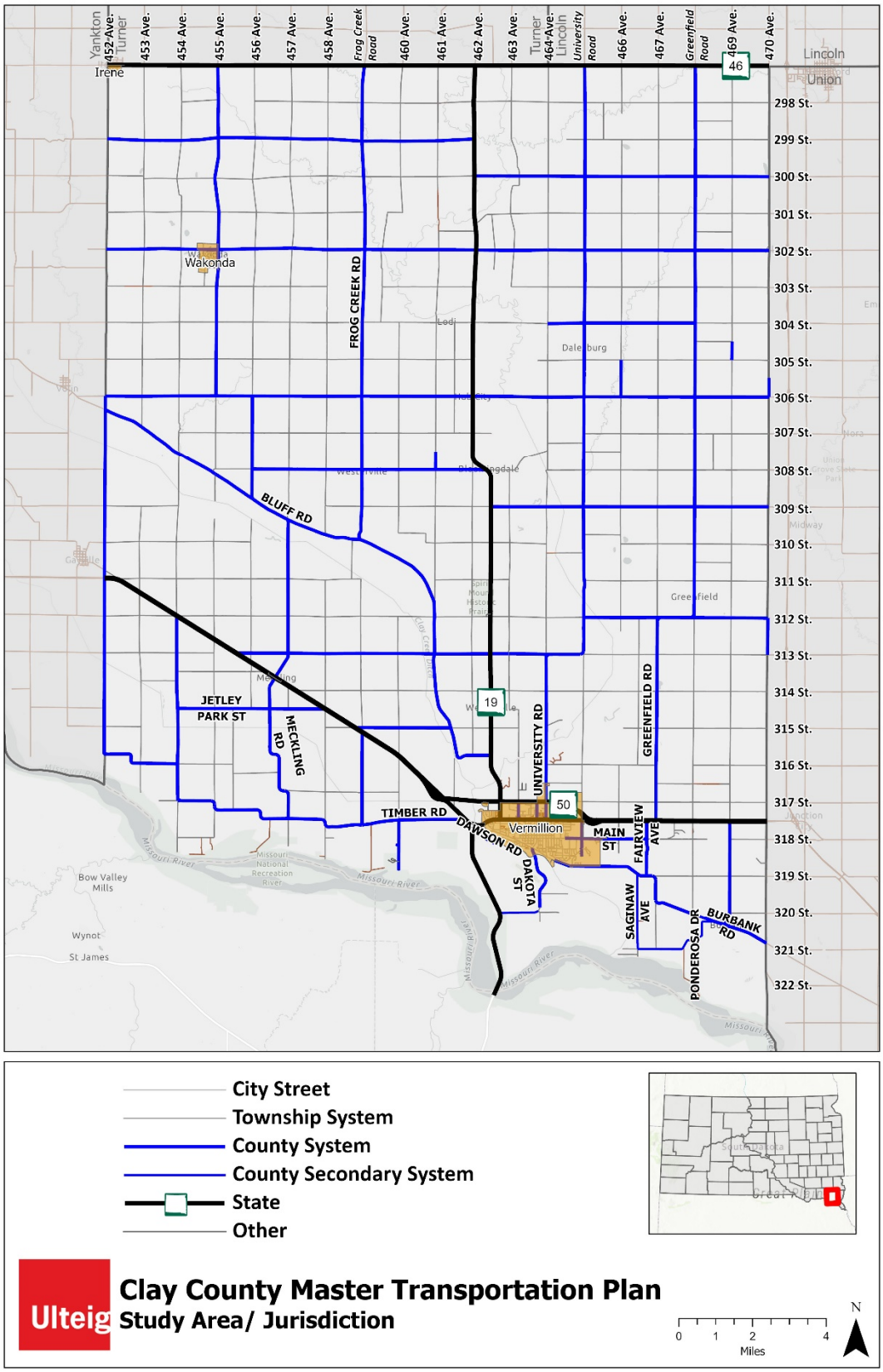

Figure 1: Clay County Study Area

C. Need for Study

Population growth and development of rural subdivisions outside of Vermillion has changed traffic levels and patterns and is anticipated to continue changing in the future. Current and future traffic volumes, crash history, truck routes, flooding trends, infrastructure service life, and multi-modal perspectives are factors that need to be considered in planning as transportation needs inevitably change over time, especially with limited funding to address all issues and needs.

The South Dakota Department of Transportation (SDDOT) has recognized the need to share funding with local governments for planning and research. Clay County applied and was thus awarded funding for a county Master Transportation Plan, to aid in prioritization of transportation needs and investments.

The Clay County Master Transportation Plan will examine and prioritize safety, infrastructure, and operations needs from a multi-modal perspective in order to enhance economic and social well-being of county residents. It will also provide vision and guidance (incorporating public input) for years to come for local decision-making. Some of the analyses in the plan will include traffic, safety, freight, bicycle/pedestrians, transit, design standards, access management, and future needs for a 20-year planning horizon *(2045).*

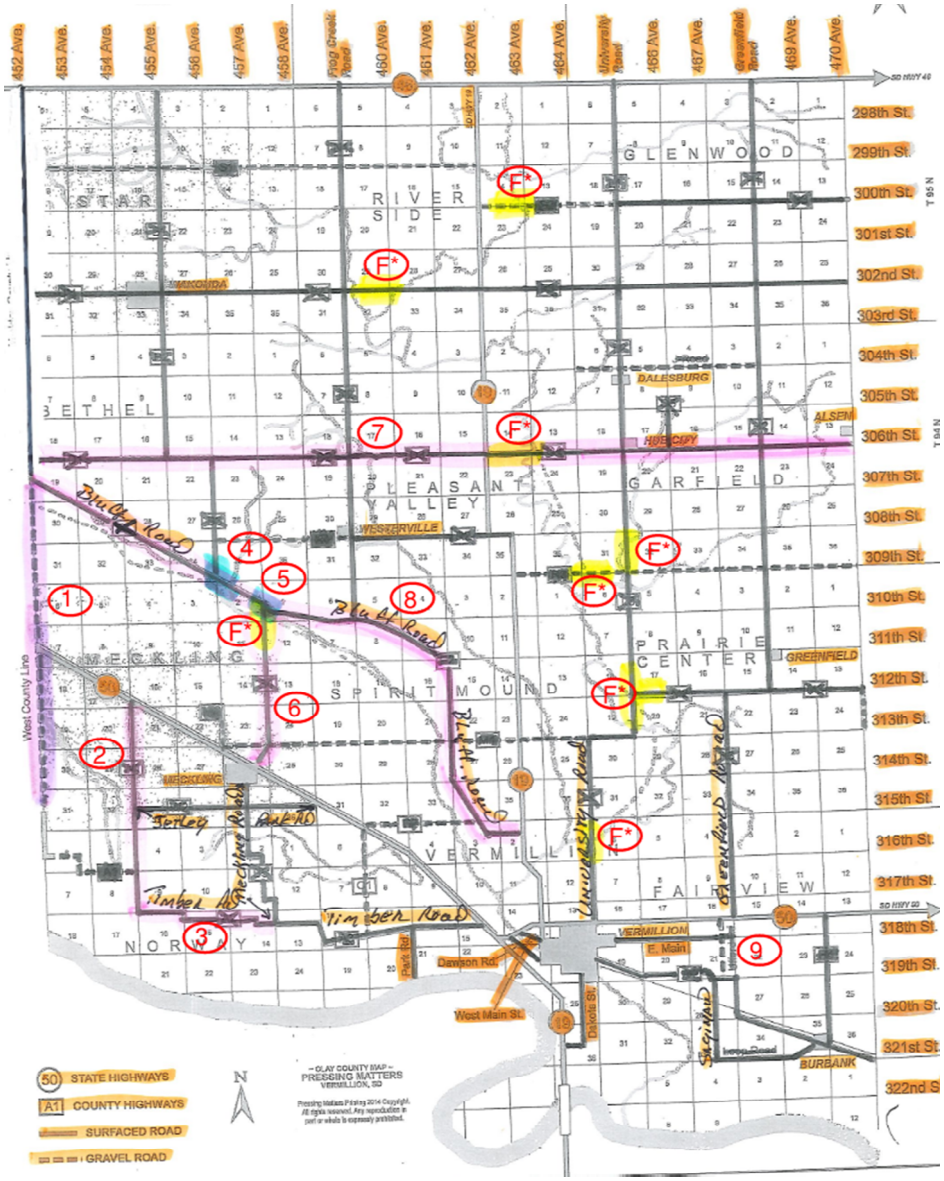

Figure 2: Map of known issue locations (provided by Clay County).

(1) 452 Ave: Gravel road with high truck traffic. Future alternative could be “oiled road.” There are no traffic counts available at this location between Bluff Road and SD 50. Traffic count south of SD 50 in 2018 was only 38 veh/day.
(2) 454 Ave: Narrow road
(3) Timber Rd: Narrow road, steep inslopes
(4) Intersection of Bluff Rd & 456 Ave: Geometry of intersection is not ideal
(5) Intersection of Bluff Rd & 457 Ave: Geometry of intersection is not ideal
(6) 457 Ave: Narrow road and narrow structure parapets
(7) 306 St: Narrow road and narrow structure parapets
(8) Bluff Rd: Narrow road and narrow structure parapets, horizontal curves and hills
(9) Fairview Ave: Gravel road, geometry through tree grove is not ideal, poor sight distance, horizontal curves and steep hill, roadside hazard is a steep drop-off.
(F*) Eight (8) Locations noted for flood prone roads, particularly during spring thaw

D. Study Schedule

September, 2021	*Notice to Proceed*
September, 2021	*Kick-off Meeting*
October, 2021	*Methods and Assumptions Meeting*
December, 2021	*Study Advisory Team Meeting #3*
October 2021 – January, 2022	*Baseline Conditions Analysis*
January, 2022	*Study Advisory Team Meeting #4, #5*
February, 2022	*Internet Based Survey and Website*
February, 2022	*Public Input Meeting #1*
March – April, 2022	*Standards Development and Future Needs Assessment*
May, 2022	*Study Advisory Team Meeting #6, #7*
June, 2022	*Public Input Meeting #2*
March – July, 2022	*Draft Report*
July, 2022	*Present to Clay County Commission*
September, 2022	*Final Report*
September 30, 2022	*Work Order Complete*

E. Facilities That Will be Affected by the Study

The study focus will be county-owned and maintained roadways and bridges, transit systems and services operating within Clay County, and an assessment of multi-modal facilities such as pedestrian and bicycle facilities.

F. Previous Studies

The following studies will be reviewed for consistency with the Clay County Master Transportation Plan:

- *Clay County Comprehensive Plan – In progress*
- *SDDOT Long Range Transportation Plan – 2021*
- *Clay County Five-Year County Highway and Bridge Improvement Plan – 2021 (Please provide, if available)*
- *Clay County Pre-Disaster Hazard Mitigation Plan – 2019*
- *Vermillion Comprehensive Plan – 2018*
- *Vermillion Bicycle Master Plan – 2018*
- *SECOG 2019-2023 SECOG Comprehensive Economic Development Strategy – 2018*
- *National Parks Service Long Range Transportation Plan Midwest Region* –2016
- *Vermillion Area Transportation Plan – 2012*

G. Study Advisory Team

The Study Advisory Team consists of representatives from Clay County and SDDOT.

Drew Gunderson	Clay County Planning
Richard Hammond	Clay County Commission
Betty Smith	Clay County Commission
Rod Polley	Clay County Highway
Layne Stewart	Clay County Emergency Management
Steve Gramm	SDDOT – Project Development
Logan Gran	SDDOT – Project Development
Joe Sestak	SDDOT – Mitchell Region
Jeff Brosz	SDDOT – Transportation Inventory Management
Cody Axlund	SDDOT – Administration

2. STUDY AREA

The study area is Clay County, SD, and all communities and surface transportation infrastructure there within. The focus of the Plan will be County Highway System. Refer to Figure 1.

3. ANALYSIS YEARS/PERIODS

The existing year of analysis will be 2022. The design year for the Clay County Master Transportation Plan will use a 2045 planning horizon.

4. DATA COLLECTION

A. Traffic Volumes

The SDDOT has provided traffic counts at various locations throughout Clay County, mostly from 2018, including many locations along county roadways. See Figure 3 to see the extent of the available traffic count data.

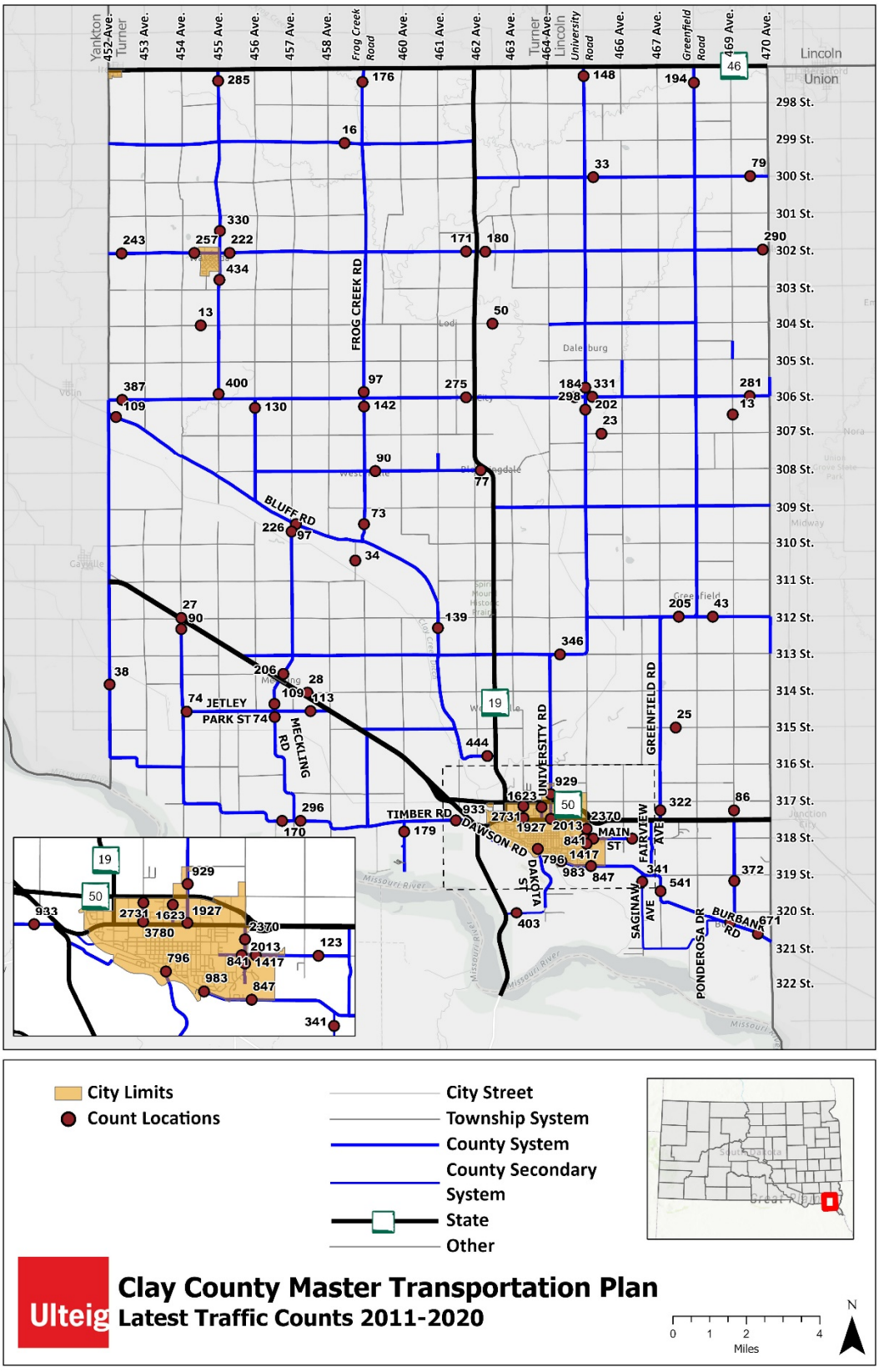

Figure 3: Latest Traffic Counts 2011-2020

As part of this study, County staff has indicated nine (9) road segments and/or spot locations where the County has observed and/or received complaints regarding load limits, sight distance, traffic congestion or heavy and/or difficult truck turning movements. An additional eight (8) spot locations were identified as flood-prone locations. These locations are indicated in the Map of Known Issues in Figure 2. If traffic or classification data is needed as part of the analysis at these locations, the SDDOT may be able to collect data on paved roadways by request if given enough lead tie time to schedule before the need for analysis purposes or provide video if available. If SDDOT cannot collect, Ulteig will collect the traffic data. The traffic data collected by Ulteig may include 24-hour traffic volumes, samplings of peak hour traffic counts and/or turning movement and vehicle classification counts as necessary to calibrate/estimate heavy vehicle percentage, peak hour factor, and K factor. Two of the identified spot locations were intersections.

The following County Roads have no traffic count data, and most appear to be low volume. Ulteig has determined with the Project Team that two of the following roads will receive a 24-hour traffic count:

- 452 Ave, between 306 St and SD Hwy 50, Gravel – Conduct 24-hour traffic count
- Fairview Ave, East of Vermillion, Gravel – Conduct 24-hour traffic count
- 304 St, Gravel – Data gap, traffic count not necessary
- 309 St, Gravel – Data gap, traffic count not necessary
- 313 St, Gravel – Data gap, traffic count not necessary
- 315 St, Gravel – Data gap, traffic count not necessary
- 459 Ave, Gravel – Data gap, traffic count not necessary
- Dawson Rd, West of Vermillion, Paved – Data gap, traffic count not necessary

Ulteig will collect AM and PM peak hour turning movement counts at 2 locations:

- Intersection of Bluff Rd & 456 Ave
- Intersection of Bluff Rd & 457 Ave

The SDDOT has indicated in the Request for Services that they may be able to collect data on paved roadways by request if given enough lead time. The SDDOT may be able to video for turning movement counts, and provide video to Ulteig to conduct a desktop count. Ulteig will reach out to SDDOT if it is possible to get assistance on this effort.

Traffic volumes collected in the field will be applied seasonal factors provided by the SDDOT. All traffic volumes will be extrapolated to a baseline condition year 2021 based on annual growth factor provided by the SDDOT.

B. Crash History

The SDDOT has provided crash history data for the most recent available 5-year period, 2016-2020.

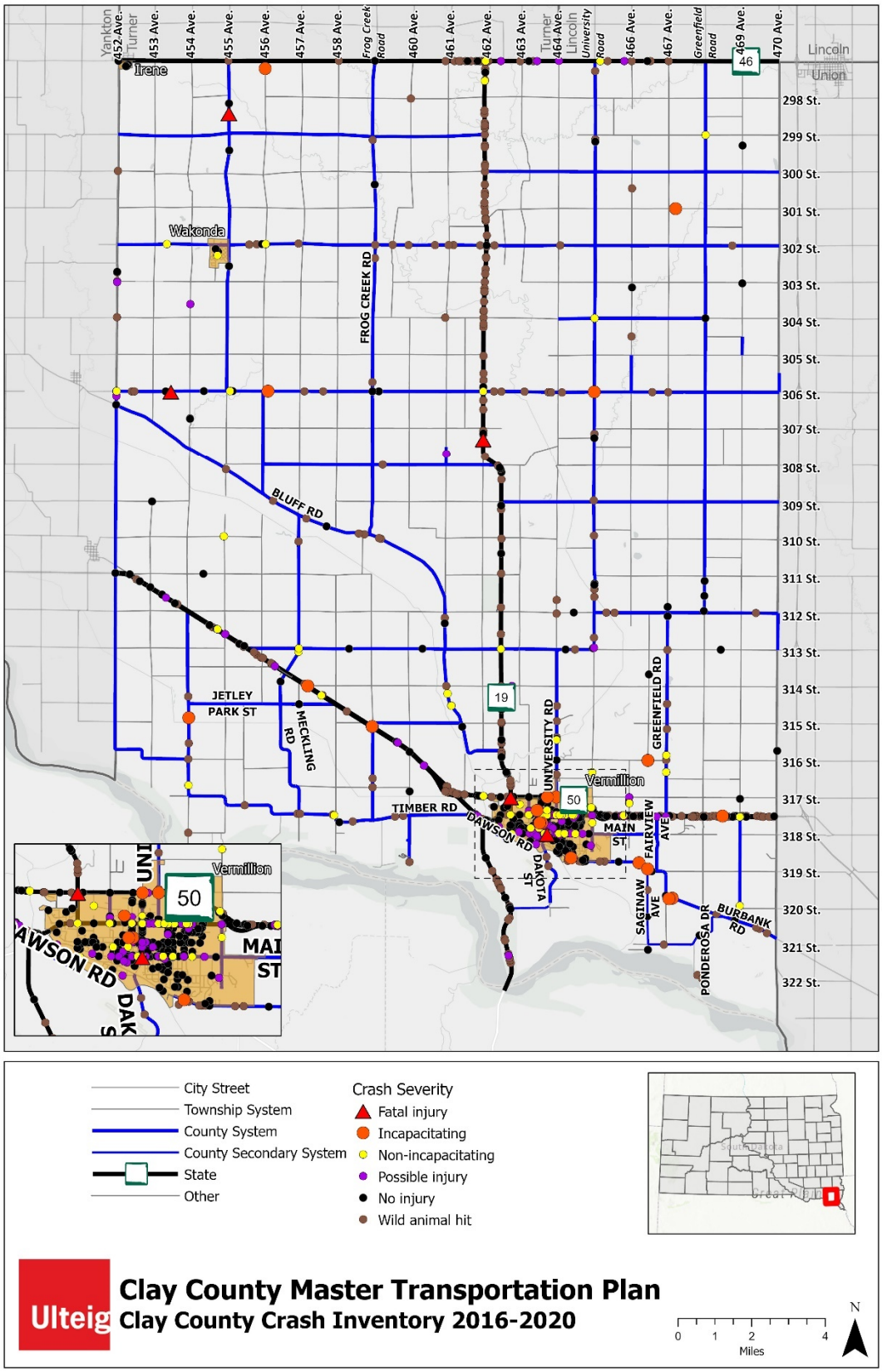

Figure 4: Clay County Crash Inventory 2016-2020

C. Special Road Segments

Ulteig will collect data for nine (9) road segments and/or spot locations where the County has observed and/or received complaints regarding load limits, sight distance, traffic congestion or heavy and/or difficult truck turning movements. An additional eight (8) spot locations were identified as flood-prone locations.

D. Bridge Inspection Data

Ulteig will review the state of the bridge network for county-owned & maintained bridges by utilizing all available National Bridge Inspection Standard (NBIS) data. Technical expert review of bridge reports has not been identified for any specific bridges at this time. NBIS data comes from online sources and/or SDDOT

E. Internet-Based Survey

An internet-based survey will be used to collect input from the public to understand origin-destination behaviors, travel modes, and transportation needs. The Study Advisory Team will review and approve the survey questions, which will then be hosted by the consultant's or a third-party website. The same survey questions will be made available in paper form by special request.

F. Other Relevant Data

Other data will be sourced to complete existing baseline conditions including previous studies and plans, GIS mapping data, ordinances, design standards, roadway network classification, crashes, development issues/practices, level of service, design standards, deficiencies, issues, and a review of bicycle, pedestrian, transit, freight, rail, and airport facilities.

5. TRAFFIC OPERATIONS ANALYSIS

For future levels of service along identified key routes and intersections, the analysis will include an estimation of AM peak, PM peak, and volume/capacity ratio for the 20-year time frame without improvements. The most recent release of Synchro or HCS software will be utilized in order to accommodate Highway Capacity Manual (HCM 6th edition) outputs such as level of service.

Due to the generally low volumes, it is assumed that volume/capacity ratios (V/C ratios) will be sufficient for traffic operations congestion analysis and planning along the majority of county corridors. Additionally, *SDDOT Road Design Manual* Chapter 15 will be used for guidance on capacity planning.

Determination of traffic analysis parameters such as ideal saturation flow rate, peak hour factor, and heavy vehicle percentage will be according to field-measured calibration, SDDOT provided values, *SDDOT Road Design Manual* Chapter 15, or HCM defaults, in that same order of precedence. All deviations will be justified.

6. TRAVEL FORECAST

All county road traffic volumes will be projected according to the SDDOT provided annual growth rate. Historical traffic growth trends will be used if a more aggressive growth rate is reliably justified based on available data. If available, known forecasted changes in local land use will also be considered.

7. SAFETY ISSUES

The SDDOT will provide crash data for the most recent available 5-year period. Additionally, the County has indicated road segments or spot locations with known issues, some of which may include safety concerns. Additional locations may arise as a result of safety analysis or public input. Crash analysis will be performed on county roads and intersections to pinpoint trends and to explore safety countermeasures. If available, crash rates will be compared to statewide averages.

8. SELECTION OF MEASURES OF EFFECTIVENESS (MOE)

Measures of Effectiveness (MOE) for the Clay County, South Dakota Master Transportation Plan include the following:

- Level of Service (LOS) will be utilized as appropriate and described according to HCM 6th Edition to ensure facility design provides acceptable traffic operations at intersections. LOS B or better is desirable for general planning purposes in rural areas, and LOS C or better is desirable for general planning purposes for urban/suburban areas or intersections. The V/C ratio will be utilized as appropriate and described according to *SDDOT Road Design Manual*, Chapter 15, to ensure all county corridors have a sufficient number of lanes. A daily traffic V/C ratio of less than 1.0 for 20-year planning purposes is desirable according to Table 15-10 in *SDDOT Road Design Manual* (e.g., less than 8000 veh/day for rural 2-lane road).

- A reduction in the number and severity of crashes through to the implementation of safety countermeasures[1] including safe and proactive system approaches, traffic safety technologies, illumination, and/or advanced technologies, as well as identification and correction of safety deficiencies throughout the Clay County transportation network. MOE's for plan purposes include calculating Crash Reduction Factors after safety countermeasures are implemented.

- A reduction in the number and severity of crashes involving pedestrians and bicyclists through the adoption of traffic calming devices, advanced warnings, and quick-build projects, where appropriate, aimed at reducing traffic speeds, shortening crossing distances, and alerting drivers to the presence of pedestrians and/or bicyclists. MOE's for plan purposes include calculating Crash Reduction Factors from the *Crash Modification Factors Clearinghouse* after safety countermeasures are implemented.

- Increased usage of active transportation modes and other alternative modes to the traditional automobile trip.

- Phased implementation of a Clay County trails network.

9. FHWA INTERSTATE ACCESS MODIFICATION POLICY POINTS

There are no plans for interstate access modification as part of this Plan.

[1] Richard, C. M., Magee, K., Bacon-Abdelmoteleb, P., & Brown, J. L. (2018, April). Countermeasures that work: A highway safety countermeasure guide for State Highway Safety Offices, Ninth edition (Report No. DOT HS 812 478). Washington, DC: National
Highway Traffic Safety Administration.

10. DEVIATIONS/JUSTIFICATIONS

There are no plans to deviate from study standards. If deviations are determined to be necessary, they will be documented and presented to the Study Advisory Team and this document may be amended.

11. CONCLUSION

The study is expected to fulfill the following objectives:

- Complete a list of transportation issues and needs facing Clay County
- Develop feasible solutions to address those issues and needs that meet current design standards and/or traffic level of service expectations under both the current and predicted future traffic conditions while promoting a livable community that will enhance the economic and social well-being of Clay County residents.
- Create final products for use by Clay County and the SDDOT which will provide guidance to implement recommended improvements and react to future development plans within the area.

Appendix A

Methods and Assumption Meeting Summary

Date: October 26, 2021

Location: Microsoft Teams Video/Conference Call, multiple locations

Attendees: Will Kerns - Ulteig
Paul Deutsch - Ulteig
Abdullah Kurkcu - Ulteig
Eric Milliken - Ulteig
Steve Gramm – SDDOT
Jeff Brosz – SDDOT
Logan Gran – SDDOT
Cody Axlund –SDDOT, Local Gov Assistance
Rod Polley – Clay County Highway Superintendent
Richard Hammond – Clay County Commissioner
Drew Gunderson – Clay County Planning & Zoning, Veterans Affairs, and County Welfare
Layne Stewart – Clay County Emergency Manager
Betty Smith – Clay County Commissioner

Introductions: The attendees introduced themselves.

Stakeholder identification discussion:
Required Stakeholders

- School Districts
- Municipalities
- Townships

Potential Stakeholders

- Nutrient (Fertilizer companies) or heavy road users
- Ethanol Plants, but none in Clay County
- University of South Dakota
- School Bus Inc. (changed name to something else)
- BNSF
- Utility Providers
- Rural Fire Districts
- Vermillion Airport
- Vermillion Transit
- Bicycle Group (guy that owns bike shop is head guy. Jose with the City would have info)

Plan Methods and Assumptions Document Review and Feedback:
The group discussed the number of bridges in Clay County, which is shown as 75. The total number typically decreases each year as bridges close, and it changes regularly. Cody said he would look into it and let Will know the total number and the bridges planned to be closed.

The Group discussed Known Issues. Rod said he will clarify and explain in more detail for Will in an

email. He said there are issues in the northern part of the county too, in a recent email to Will, and they are not shown here.

For the previous studies, Drew said the Clay County Comprehensive Plan is not complete yet, so 2020 is not the correct year.

On the Study Advisory Team, Logan Gran's name is missing.
On the Analysis Period, Steve said delete the 20-year, and just say 2045 planning horizon.

Data Collection needs discussion:
Rod said there is high truck traffic on 452 Ave from 306 St south to the end (gravel), would like to see a traffic count there, and he would look at the list and see which roads he thinks a traffic count would be beneficial.

The group discussed crash maps and interactive crash maps online. The SDDOT has this capability posted already online. Steve said the crash map shown should show the specific 5 years on the map.

For Travel Forecasts, Steve said growth rate is fine for future projections, but you maybe would adjust the projections if there is a known big development in a specific area. There is no traffic demand model in Clay County.

For Measures of Effectiveness, Steve said the State LOS for rural areas is LOS B or better, not LOS C as shown. Towns like Vermillion would be C or better. It is the Clay County's Plan, so County's ultimate decision what they want.

Steve said that an MOE of crash reductions should be explained how you will go about that, such as using crash reduction factors.

Next Steps:
After Rod clarifies the issues map, Ulteig will plan data collection needs. The rest of the M&A document can be revised and sent out for review. Hopefully data collection can get that going before the snow season starts.

Steve said to add documentation summary or meeting minutes into the appendix of the final M&A document.

Action Items:

- Layne – Find out name of the bus company
- Rod/Layne – Provide Contact information for stakeholders if on file
- Rod – Provide more detail about the Map of known issues and what the issues are to be analyzed.
- Rod – Let Will know where some traffic counts would be beneficial, including if there are any intersections to count in addition to the two listed already.
- Rod/Layne/Richard/Betty – One of Clay County on the SAT could sign the final version of the Methods and Assumptions, or none of them. Steve Gramm said it is optional.
- Cody – Let Will K. know total number of bridges open and which ones are scheduled to be closed
- Ulteig – Will K. to assemble stakeholder list for SAT team review

- Ulteig – Update maps. Remove the County shield logos (not official county road names). Add street name (Street, Avenue) and unique street labels to the map instead.
- Ulteig – Update Methods and Assumptions and send out final version for review/comments before sending to Steve/Clay County for signature.

APPENDIX B
PUBLIC MEETING #1 SUMMARY AND SURVEY RESULTS

PUBLIC MEETING #1 SUMMARY AND ONLINE SURVEY RESULTS

Clay County Master Transportation Plan

Public Meeting #1 and an internet-based public survey were open for public comment from March 25 through April 25, 2022.

Public Meeting #1 was hosted at the Clay County 4-H Center in Vermillion, SD, on April 11, 2022. Stakeholder meetings were hosted at the same location in the afternoon of the same day. Public comments via comment form, interactive mapping, and an internet-based public survey were accepted until April 25, 2022. Stakeholders identified by the Study Advisory Team were emailed direct invitations for the meetings, and public advertisements were posted in the following newspapers:

- Vermillion Plain Talk (official Clay County newspaper) – March 25 and April 1, 2022
- Irene Tri-County News (official Clay County newspaper) – March 24 and March 31, 2022
- Yankton Press and Dakotan – April 1, 2022
- Beresford Republic – April 1, 2022

Meeting Schedule

3:00 PM to 4:00 PM – Stakeholder Meeting: Townships, Municipalities, School Districts, Other
4:00 PM to 5:00 PM – Stakeholder Focus Group Discussions
5:000 PM to 7:00 PM – Public Meeting #2

Attendance

Stakeholders – 4
Public – 5
Study Advisory Team and Staff – 7

Summary of Materials Provided

Exhibits were placed in the room for attendees to browse. A presentation was made using PowerPoint. Attendees were asked to record their presence on the sign-in sheet and leave optional comments on the comment cards provided.

Comments and Questions

During the meetings, attendees commented and asked questions about the study and materials presented.

<u>Comments During Meetings on April 11, 2022 or written on Comment Cards:</u>

- Thank you for coming today – The information was very good to learn about. The trail plan is interesting and tangible and possibly doable in our county. Looking forward to seeing more ideas. Really excited to visit the website. Interactive capability is insightful!
    - *Response: Thank you for your comment.*

- I particularly am impressed & feel very strongly in favor of the bicycle & pedestrian trails plan. This is futuristic & will recruit students, faculty, new residents to the area. Keep it in! Figure out the way to fund. Fabulous plan!
    - *Response: Our next step on the trails plan is to find some case studies showcasing examples of how other counties around the US implement and maintain their trail systems. We will also develop rough maintenance costs per mile of trail for both hard surface and loose surface trails. We have already identified a case study example in Vilas County, Wisconsin. Links: https://biketheheart.org/ and https://www.vilaswi.com/itinerary/summer-biking/ and https://www.vilaswi.com/trail-activities/.*

- Waze traffic is used by SDDOT for Sturgis Motorcycle Rally. It may be an option for modern traffic levels on roads you are lacking data.
    - *Response: Thank you for your comment. We will look into web-based traffic data.*

- During flooding, it is problematic for bus routes. Sometimes they can't make pick ups and can only go so far.
    - *Response: As part of this study, we are considering how road closures affects routes for people on either side of the Vermillion River and hold a focus group to identify auxiliary routes for use during seasonal flooding.*

- DOT and FEMA won't allow grade raises by some bridges. 302 St especially could use a grade raise.
    - *Response: As part of the study, we will be looking at potential physical improvements, but floodways are also an option. Instead of fighting the water, you allow it by reinforcing the roadway to stay intact during flooding. Clay County has already started experimenting with this idea with shoulder erosion control treatments. Our team has found an international floodway design resource guide that could be helpful for Clay County at https://roadsforwater.org/guideline/conclusions-it-pays-off/5-design-of-floodways/.*

- With floodways or similar ideas, you still have a road that is closed, grade raise is the only way to keep it open during flooding.
    - *Response: As part of the study, we will be looking at potential physical improvements. We will work with Clay County to identify priority roads for consideration of an elevated profile if feasible.*

- Who owns the trails, even conceptually? Government entity? 501c?
    - *Response: It is very early in the process, and have not identified a champion or maintenance entity yet for trails in Clay County. It could be a government entity, 501c (tax exempt organization), or another way. There is potential for regional cooperation beyond county borders too, such as Union County where a similar trails plan ideas is being proposed.*

- If permanent trails pavement is destroyed in flooding, we have seen it take years to get funding approved. The system itself can be a hurdle. There is an example from 2011, and 11 years later, we are still waiting out the process.
    - *Response: This is a good lesson, and adds to the case for loose surface, low maintenance trail types. The idea of a pedestrian access easement allows a maintenance entity to clear and reopen the corridor quickly.*

- Are any of the bridges that are closed going to be reopened?
    - *Response: The bridges that are closed right now are not being considered for replacement, though there are some shown on the map at the time of Public Meeting #1 as closed that have been replaced.*

- Do you know about the bike path plan from Vermillion to Coffee Cup Truck Stop? There was one land owner that was blocking the idea.
    - *Response: We will look into this and consider updating the trails concept map with this information included.*

- 2 or 3 of the bridges shown south of Wakonda have been replaced, so they should not be shown as closed.
    - *Response: We will follow-up and update the bridge database.*

- Flooding has big impacts to school buses and fire departments
    - *Response: We will set up a focus group to get a better understanding of what happens when flooding occurs. The randomness of flooding makes it more difficult, but we are looking at ideas for detour routes and/or flood evacuation routes. An evacuation plan can also highlight the most important routes that should be considered for grade raises.*

- Consider how hunting season may affect location of bike or pedestrian trails.
    - *Response: We will look into this idea, a possibility exists for seasonal closure of trails.*

- If trails flood and get washed out, there can be significant cost to reclaim paved trails. If there is a dike, it is also important to consider which side of the dike the trail should be on.
    - *Response: This may be a motivating factor to use loose surface trails that can be reclaimed at significantly less cost.*

- There is an app called All Trails that is good for finding existing trails when you are out and about.
    - *Response: Thank you for your comment.*

- Having a trails plan in this study is an important part of attaining funding for it. Simply having it in this plan will increase the chances of receiving funding for trails.
    - *Response: Yes, the adoption of a trails plan by Clay County will immediately qualify the County for a variety of different grants and funding types. However, the grant application process can also be an expense. We may recommend using a 501c organization or volunteers for grant applications instead of relying on only County employees. Grant applications almost always have to be sponsored by the County with a letter of support, and grants are generally not awarded without an identified maintenance entity.*

- A lot of people use SD 50 as a cyclist route.
    - *Response: Thank you for your comment.*

- The reflective spinners on stop signs are really helpful and make stop signs more noticeable.
    - *Response: The County has stopped using these because the wind destroys them. The County prefers to use lights on stop signs instead.*

- Flood mats on the shoulder are recommended to have surfacing go over them on the shoulder so that the water rushing over the road can't get between them and dig under the flood mat. Establishing the grass is also important. If you bury it under some topsoil, you don't have to worry about fires destroying the flood mat too.
    - *Response: Thank you for your comment. The plan will incorporate this language.*

- A grade raise acts as a dam and that can cause issues elsewhere.
    - *Response: Thank you for your comment.*

- Will this plan prioritize projects?
    - *Response: Yes. We will work with the County to identify and prioritize projects.*

Comments submitted outside of the meetings and survey:

- 1. The intersection [Bluff Road and 457th St.] above is a Y intersection where there is no warning to a person driving eastbound on the Bluff Rd that the cars turning left onto the Bluff Rd from 457th will not stop. A deadly intersection waiting to happen. 2. Where we live is a perfect spot to develop a hike/mountain bike/horse trail a diagonal to Spirit Mound. We'd love to discuss this with your team.
    - *Response: The intersection of Bluff Rd and 457 St is an intersection we are analyzing for improvements as part of the plan. Thank you for your idea, and we will reach out to you for more details regarding a potential trail route.*
- I was just wondering if we could get River access easements for walkers and non-motorized boats at more places along the Missouri River? I'm thinking at the bottom of Armstrong Rd. It would be a nice place to wheel a kayak on a dirt trail and access Goat Island, which is a National Park. There are other small roads like this: Bottolfson Rd for one, that could be considered.
    - *Response: The trails plan included in this document, details each trail corridor in rive adjacent trail corridors, this plan calls for increased river accesses, benches, fishing locations, and wayfinding signage.*
- I would love to see a trail connecting the Frost Trail to North Alabama Bend trail and running all the way to Clay County Park
    - *Response: We have included this trail connection in the Clay County trails master plan.*

Individual comments submitted via interactive mapping:

- Request for a Vermillion to Yankton Trail Connection
    - *Response: We have included a Vermillion to Yankton trail connection in the Clay County trails master plan.*

SIGN-IN SHEET

Ulteig

Clay County Master Transportation Plan

Public Meeting #1 – April 11, 2022 (5:30 PM to 7:00 PM)

Clay County 4-H Center – 515 High Street – Vermillion, SD

Name	Organization	City/Address	Email
Paul Deutsch	Ulteig	Sioux Falls, SD	Paul.Deutsch@ulteig.com
Damon Alvey	Vermillion School	Vermillion, SD	damon.alvey@k12.sd.us
Rod Polley	Clay Co Hwy	Vermillion, SD	Rod.Polley@claycountysd.org
John Prescott	City of Vermillion	Vermillion, SD	johnp@cityofvermillion.com
David Hutchison	I-W Schools	Wakonda, SD	dave.hutchison@k12.sd.us
Richard Hammond	Clay County	Vermillion	rhhheie gmail.com
Joseph Sestak	SD DOT SAI	Yankton	Joseph.Sestak@state.sd.us
Betty Smith	Clay County	Vermillion	betty.smith@claycountysd.org
Steve Gramm	SDDOT	Pierre	steve.gramm@state.sd.us
MicheleDMechCng	SDDOT	Vermillion	michele.mechling@dac@gmail.com
Jeanette Williams		Vermillion SD	jdwilliams@vyn.midco.net

SIGN-IN SHEET

Name	Organization	City/Address	Email
Tina Svien	Citizen	320 S. University St. 57069	t.svien@usd.edu
Ron Peterson	"	29714 455th Ave. Wakonda	ronaldp@iw.net
Chris Kassini	Citizen	318 Joplin St	Vermillion SD ckassini23@gmail.com
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Will Kerns	Ulteig	Denver, CO	Will.Kerns@Ulteig.com

Comment Sheet

Clay County Master Transportation Plan

Public Meeting #1 – April 11, 2022 (5:30 PM to 7:00 PM)

Clay County 4-H Center – 515 High Street – Vermillion, SD

Please use the space below to leave a comment for the project team regarding the Clay County Master Transportation Plan. You may leave a comment on the form below or by submitting a comment on the project website. You also have the option to mail your comments directly. Comments will be accepted until April 25, 2022.

Project Website: https://ulteig.com/claycountymtp/

Mailing Address: Paul Deutsch
Ulteig Engineers, Inc.
5701 South Corporate Place, Suite 1
Sioux Falls, SD 57108

Comment:_____

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Name (optional): _____

Organization (optional): _____

Address (optional): _____

Phone Number (optional): _____

Email Address (optional): _____

Would you like to receive future emails about the Clay County MTP? _____

Ulteig

Public Survey Results

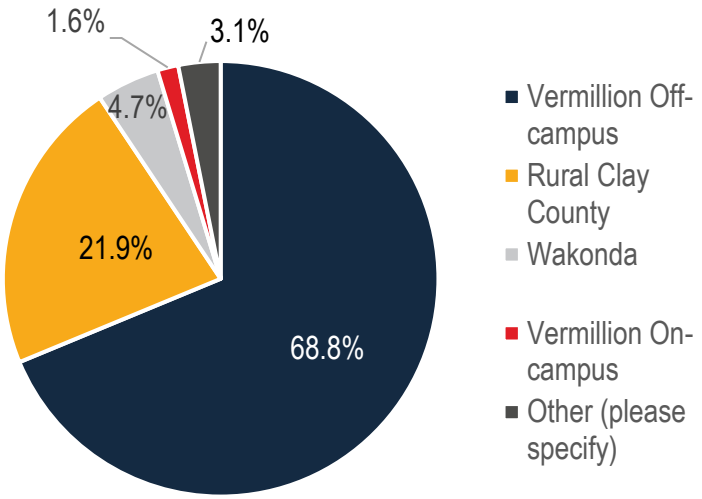
March 14 – May 5, 2022

64 Participants, 63 Completed, 0 Terminated, Typical Time Spent: 7.5 minutes

The public survey posed 26 questions relating to the existing transportation network in Clay County. There were opportunities for participants to provide feedback relating to their usage of the transportation network, overall performance, issues and concerns, prioritization of specific types of improvements, and general comments.

A total of 63 surveys were completed. The results of the survey questions, comments, and analysis are shown below. The results and comments are helpful in identifying transportation issues and opportunities in Clay County, as well as gain an understanding on where people stand regarding funding and performance of the transportation network.

1. **Where do you live?**

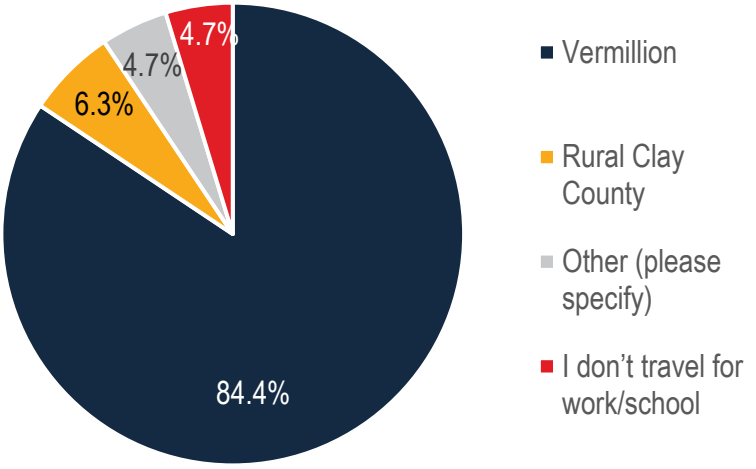


Other (please specify)

- In City Limits
- Union County

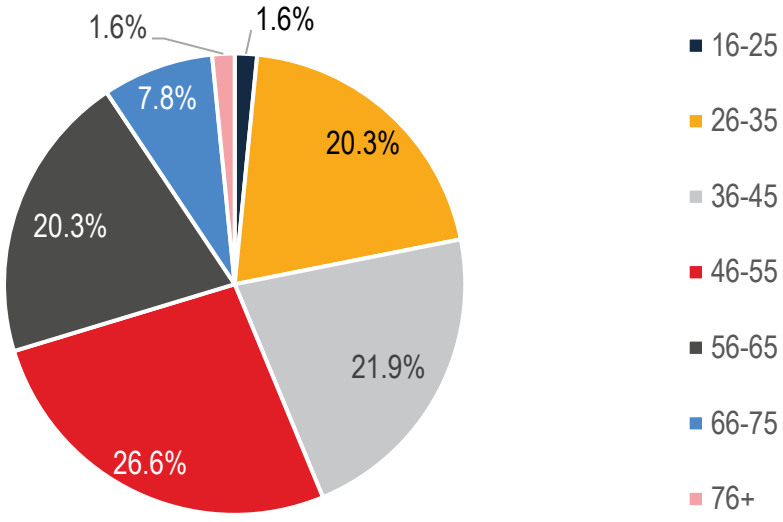
More than half of the respondents (68.8%) were Vermillion residents living off-campus while 21.9% were Rural Clay County residents.

2. **Where do you travel for work/school in Clay County? Select all that apply.**



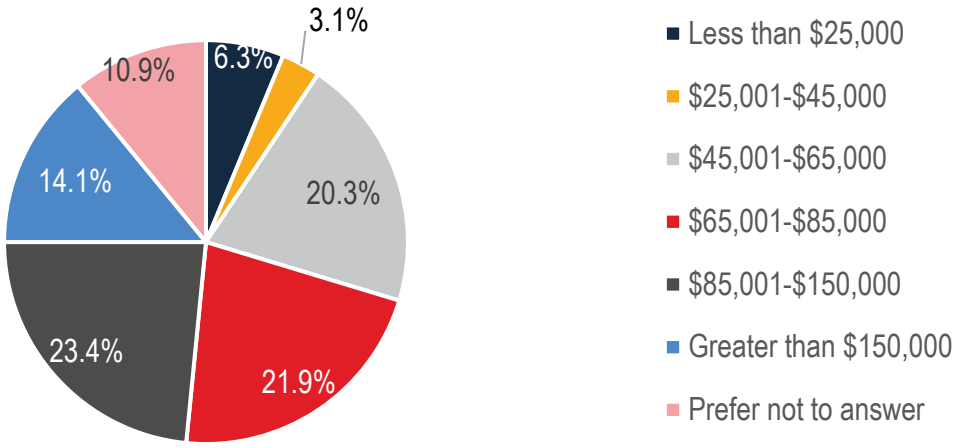
The majority of respondents were traveling to Vermillion (84.4%) for work/school in Clay County.

3. **What is your age?**



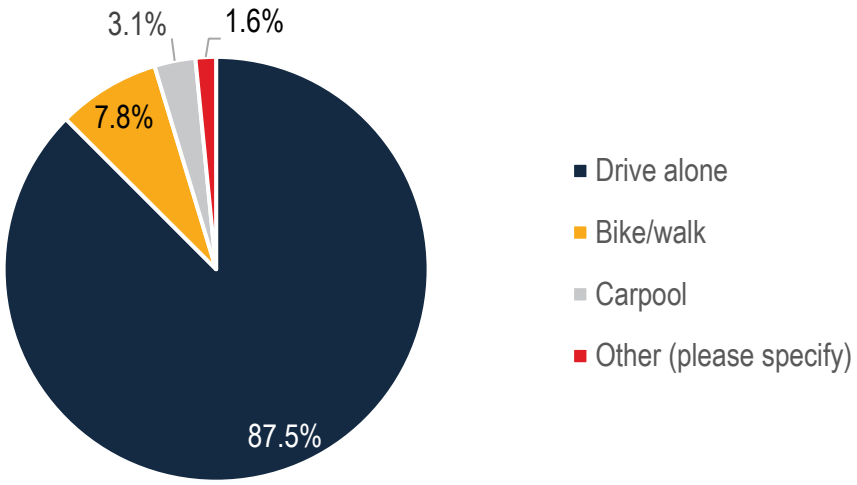
Age distribution is well distributed, though the 16-25 age group was underrepresented, meaning that University of South Dakota students will have little influence on the results of the survey.

4. **What is your gross annual household income?**



According to ACS 2019 results, median income in Clay is $50,724. Approximately 59.4% of respondents indicated that their household income is over $65,000 in the survey. 10.9% preferred not to answer.

5. **How do you typically travel to destinations from your home?**

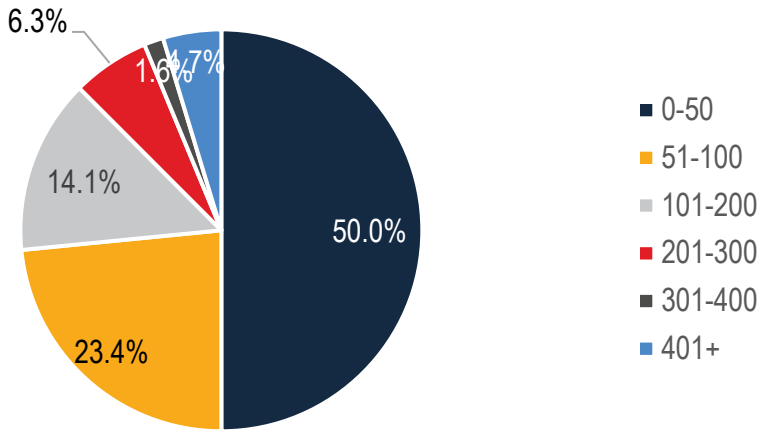


Other (please specify):

- County Vehicle typically on duty and POV when not

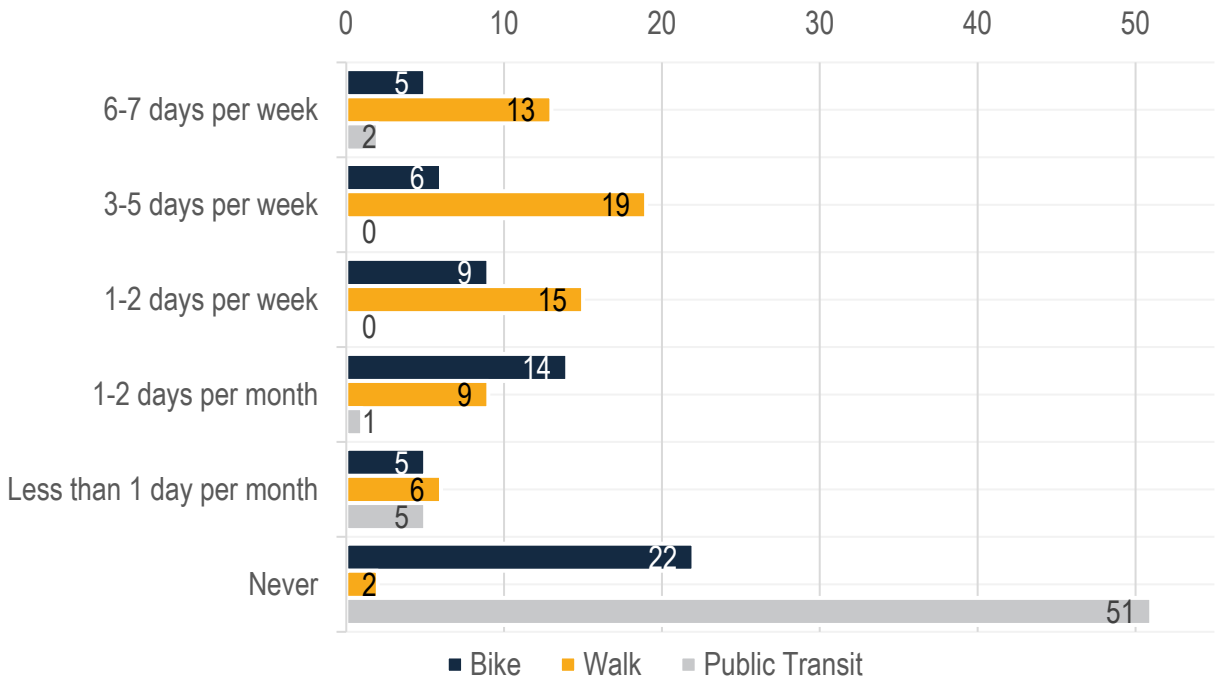
7.8% of the respondents bike or walk to school in Clay County while 87.5% drive alone

6. **How many miles do you travel in a typical week?**



Half of the respondents (50.0%) were traveling up to 50 miles while the other half of respondents (50.0%) travel over 51 miles in a typical week.

7. **During warmer months, how often do you walk/bike outdoors in Clay county? How often do you use public transit (e.g. buses, paratransit etc.)?**



During warmer months, 50% of survey respondents report that they walk 3 or more days per week. 55.7% indicated that they cycle at least 1 day per month. 86.4% of survey respondents never use public transit.

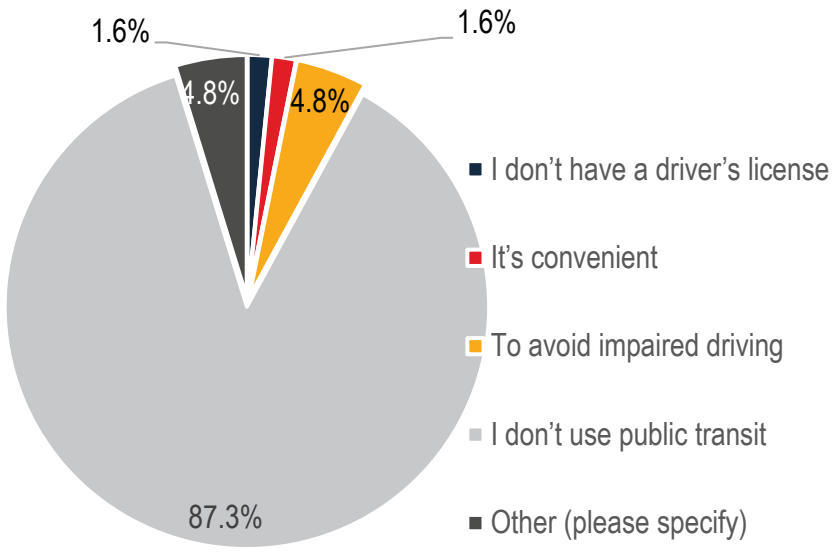
8. What prevents you from walking/biking outdoors more often than you do?

Lack of bike/ped infrastructure (10)	• No where fun to do it • Lack of bike trails/walking paths not in town • Would like bike paths that connect to destinations, like Spirit Mound, Clay Creek, Wakonda, Clay County Park, or anywhere along the river. • Insufficient bike paths around town, and existing ones are not in great conditions. • There are no sidewalks hardly anywhere, and the ones that are around are horrible--cracked, unlevel, very narrow, etc. • No shoulder on county roads • Inadequate bike lanes. • Not enough trails, only sidewalks • no trails • lack of bike trails
Time (14)	• Time - it is faster to drive • Work • Life/work • Mostly time • Time (5) • Work to much • Time • Obligations • Time • Work :-) • Busy • Time • Work • Time
Traffic/ Young or Reckless Drivers/Safety (9)	• East Main St where we live is a VERY busy road and often times people are driving way too fast so out of safety concerns we don't walk/bike as much as we would like. • Traffic Safety Concerns • traffic, ice on sidewalk/road • LIVE ON HIGHWAY 19, TRAFFIC HEAVY AND GOING 65 MPH • i live in rural clay county on a busy gravel road • Young drivers • Crazy drivers on Cherry and on Clark street, for walking. Lots of texting and driving you can see. And I hate riding bike. It's boring. • Unsafe to do so on the highway • Drivers do not yield to pedestrians around campus, even at crosswalks. For example, crossing at sidewalks onto campus, where cars should yield to pedestrians, they don't. I highly encourage you to make these more clearly pedestrian crosswalks. Examples: Signs. Raised crosswalks. Bright painted lines. We have the same issue getting go Prentis Park even where there are yield signs. Raised crosswalks with bright paint would be appreciated.
Weather (7)	• Weather. I don't walk when the weather is bad (snow, rain, sleet, etc). • Weather (5) • Lack of covered bike racks to keep my bike dry on rainy days. • Weather • Weather • Weather • Weather

Health conditions (2)	• Arthritis • Health
Multiple Reasons (6)	• Time/Lack of trails or safer roadways to walk • Time, need to transport objects I can't carry on foot or on bike, not feeling well enough to walk or bike. • Live in rural Clay County on a County Highway, which does not have shoulders for safe biking, nor is the speed of drivers patrolled well to permit walking or biking safely. • Weather & Time • Motivation, bad weather, lack of dedicated bike trails close to home. • Weather or convenience (need transportation of items).
Other (9)	• Motivation • not interested • I walk almost everyday but I don't have a bike here • Do not wish to bike on streets or sidewalks. • No desire, I play golf. • Nothing • I do for fun but drive to work due to dropping off children at school • Most streets (with the exception of Main Street) are poorly lit • Don't like biking on streets. Nowhere interesting to walk.

Things that prevent respondents from walking/biking outdoors are varied.

9. Why do you use public transit? Select all that apply.



For school	0
I don't have a driver's license	1
I have disability	0
It's convenient	1
It's more affordable	0
To avoid impaired driving	3
I don't use public transit	55
Other (please specify)	3

Other (please specify).

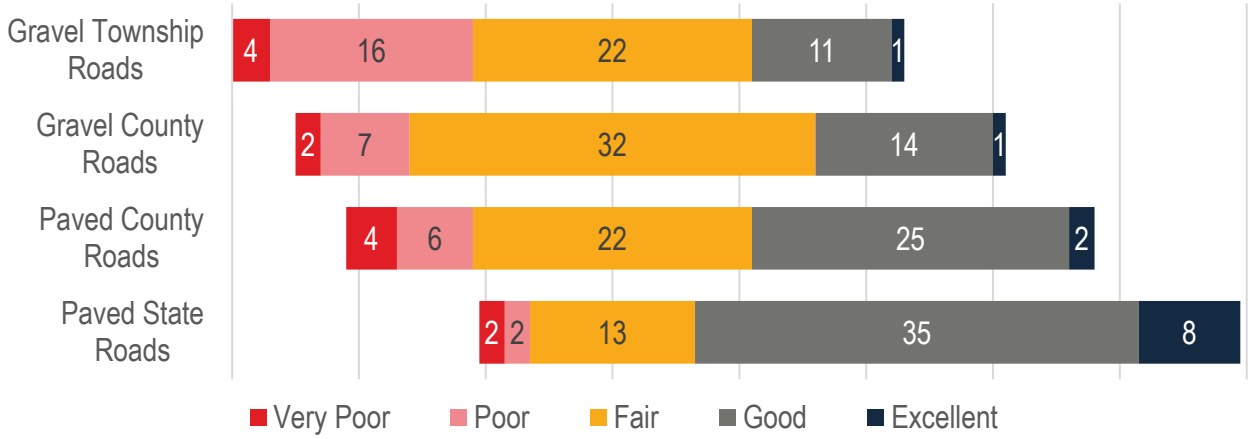
- Not offered where we live.
- Summer Red and Gold Program. Provides kids opportunities for field trips during the summer since field trips in school are non-existent
- Sober driver

The inconvenience of utilizing public access and/or the lack of access to public transit could be factors in this heavily weighted response. However, 25% of respondents (Q22) indicated they have specific areas where they would like to see additional or improved transit facility access.

10. How would you rate the quality of Clay County transportation infrastructure compared to 5 years ago?

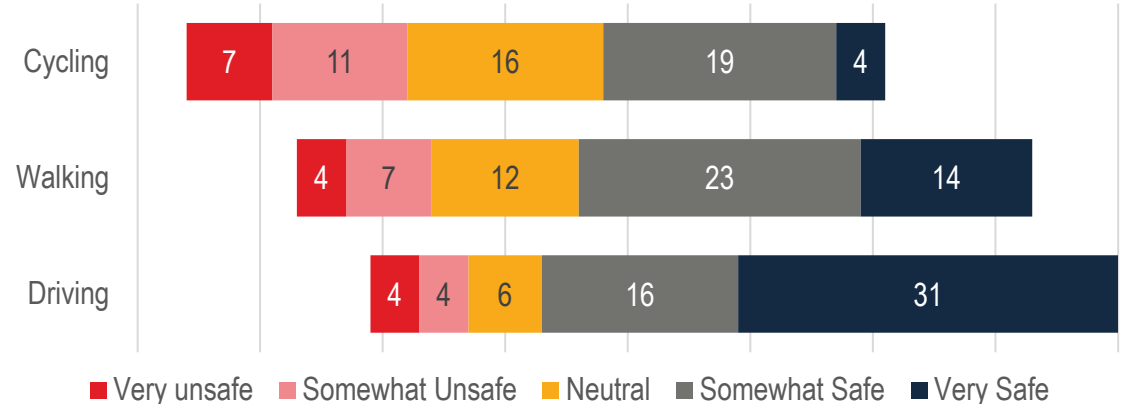
30.2% respondents responded this question as Somewhat Better or Better. 15.9% said Somewhat Worse or Worse. 23.8% said I Don't Know (not shown in chart).

11. Please rate the condition of the roads in Clay County below.



Generally respondents responded this question as Fair, Good, or Excellent depending on jurisdiction or road facility hierarchy.

12. How safe do you feel driving, walking or cycling in Clay County?



Cycling had the highest amount of respondents responding to this question as Very Unsafe to Somewhat Unsafe compared to Walking or Driving. However, Cycling (40.4%), Walking (61.7%), and Driving (77.0%) each received a high amount of Somewhat Safe to Very Safe responses. Cycling does show that least amount of Somewhat Safe to Very Safe responses of the three modes listed here.

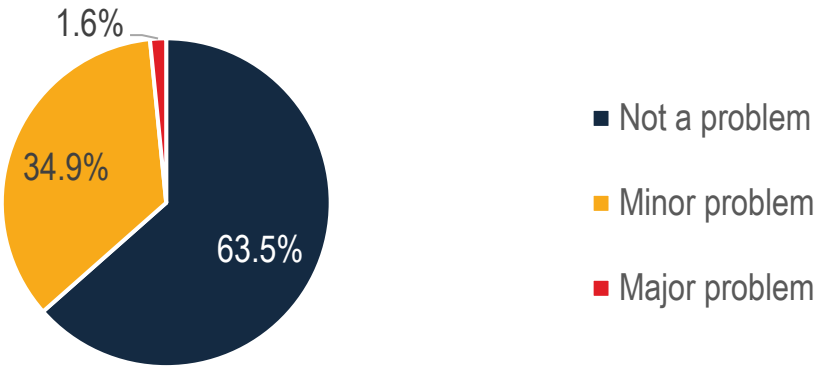
13. Identify general or specific safety issues that you are most concerned about in Clay County.

Lack of Bike/Ped Infrastructure or Poor condition (11)	• Insufficient dedicated bike lanes or in poor conditions. • Lack of bicycle lanes. • Poor sidewalks • The quality of the sidewalks, my kids trip and fall frequently on the cracked unlevel sidewalks. I've twisted an ankle on them. We don't do walks around town anymore because of this, unless it is solely on USD campus because they have nice, large, level sidewalks. • for walking and biking we need more trail systems, the roads are to busy and hard to maneuver due to loose gravel, washboarding. • lack of bike trails and sidewalks • Need more bike trails and need to maintain the ones we have. Stabilize song Vermillion River and save the path • The lack of sidewalks throughout town so have to walk on the roads. • Lack of bike and walking paths • City streets are too bumpy with manholes. Pedestrian/cycling is scary/unprotected. • Not wide enough shoulders for road bikers
Traffic/ Young or Reckless Drivers/High Speeds (12)	• Bad drivers/older drivers • People tend to ignore signage and drive very fast without regard for pedestrian or bicycle traffic • Cell phone usage amongst drivers and intoxicated individuals driving • Cars do not respect or know how to travel around/with people biking on streets, but biking on sidewalks is not possible. • phones and driving. 4 way stops • Lots of distracted drivers- from being on their phones, to being "high" or drunk driving. And the bike paths they do have on the roads, bikers don't follow them. Especially the one on Norbeck street. They ride in the middle of street, literally. • Distracted driving, speeding, drunk driving, no respect for cyclists

	• Cars do not yield in crosswalks. I hope you add raised crosswalks. Maybe speed bumps? Lots of yield signs. • People making u turns in the middle of the street downtown and USD students crossing cherry and not waiting for the light to turn. By the campus. • Normal concerns with having young children and crossing roadways. • Crossing busy roadways • 55 mile per hour speed limit on gravel roads is insane
Multiple Safety Issues (5)	• Lack of protected lanes for bicycles. Lack of awareness of rules of the road related to bicycles (among both motorists and cyclists). • Bluff Road and 457th intersection. Walking paths from Westreville to Spirit Mound, Vermillion to Spirit Mound, Spirit Mound to Clay County Park. We'd like a trail system that could connect Wakonda to Vermillion to Meckiling and the Bridge. Safety is an issue, as there are no ways to get the outdoor exercise you want without sharing the road with traffic, or crossing a road like Hwy 50 • East Main St has a very dangerous ravine where the gravel road narrows. VERY icy in the winter as the snow/ice never melts off of it. Several cars have slide in the ditch. I believe the road appears to be washing away underneath where the stream goes down the bluff which is narrowing the road. • Crossing Hiway 50 is dangerous and difficult Inadequate bike paths • Deer and bad drivers.
Road Infrastructure (4)	• Deteriorating road conditions. • Roadside safety is lone concern • Speed on County highways Inadequate shoulders and road width on County and township gravel roads to support safe agricultural travel. • Intersections without a yield or stop sign
Other (8)	• Not enough lighting. • Mostly biking downtown is my concern. • Students walking out in the street whenever and wherever. • Stop light corner of m ok ii0hwy 19 and 50 • The druggies just walk around in the areas everyone goes and it get sketchy. At the park guys will walk up to me all the time that I can tell are high • FIRE AS I LIVE IN THE COUNTRY AND WORRY ABOUT HOW FAST THEY COULD GET TO MY HOME • Bridge issues • Slowness of winter road cleanup on county roads—always significantly behind neighboring county oils
None (7)	• ? • X • No • None (3) • None • N/A • None

Many of the safety issues listed were related to walking and biking. Within the comments, there was some frustration about knowledge and education for sharing the public right of way between the various modes of travel.

14. Rate the overall level of traffic congestion in Clay County?



Traffic Congestion in Clay County is generally seen as a non-issue, or a minor proplem.

15. Are there any locations in Clay County where you experience travel delay in your travels?

Yes 18 (28.6%)	No 45 (71.4%)

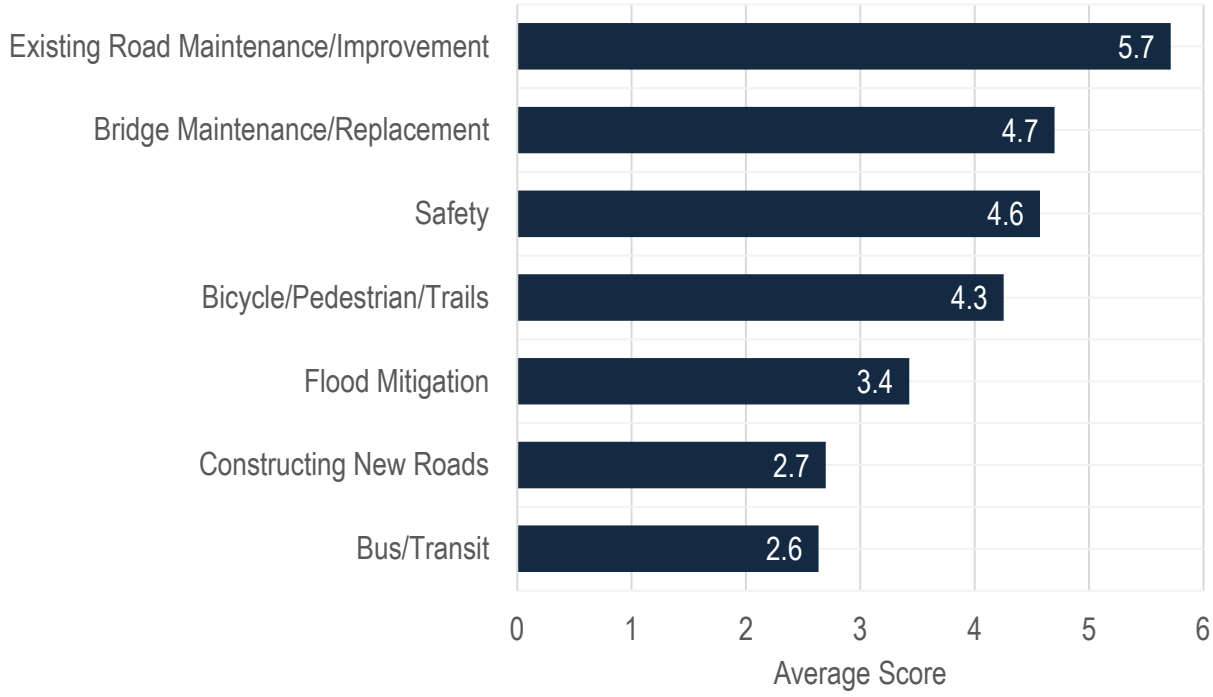
Yes, list the location and time when travel delays occur.

School Let out/drop off & University(6)	• Around schools • When schools are getting out. • By the Vermillion Middle School during morning commute. Congestion occurs with the drop off by parents and limited stop signs. • Around Jolley Elementary School and turning onto Main Street from 7:30-8:00 am (parents dropping off kids, kids crossing streets, people driving to work. • Near Campus when school day is starting/lunch time/end of school day • To from public schools
Cherry St, etc. (7)	• Slow light at Cherry and Plum St • Cherry Street around campus during noon hour and around 5pm • Stanford, Cherry, Highway 50 Bypass • Cherry St at 5 pm hard to get turned out onto street from any business as just when the traffic from one direction is stopped at a light the traffic from the other direction is coming. Doesn't seem to be any timing with the stoplights • Stop lights on Cherry street in the college • Dakota and cherry street • Cherry street by BK— students crossing
Vermilion, etc. (5)	• Downtown. 8am. And 3 pm. Narrow streets slows traffic way too muc • within the city of Vermillion • HIGHWAY 50 AND HIGHWAY 19 INTERSECTION END OF DAY

	• That stoplight by Burger king and by City Hall. The stoplight college kids either don't look, or J walk. Cars slam on their breaks or cars let them go when it's green. And in front of City Hall, it should be a 4 way stop. Us coming from the courthouse, half to pull out halfway on the street and stop. We can't see anything with cars parked (like in front of that bike store) But they must be okay with cars stopping in the middle of the road because we can't see. LOTS Of vehicles do it. Heck even the Police officers do it too. Kind of sad. • Turning left onto Dakota from Pine St. at lunchtime.

The responses are varied around the City of Vermillion.

16. Rate the following transportation project types in order of importance. You can drag and drop your responses.



Survey respondents ranked Existing Road Maintenance/Improvement as their priority in Clay County. Bridge Maintenance/Replacement, Safety, and Bicycl/Pedestrian/Trails were also listed as relatively high priority items, while Bus/Transit and Construction New Roads were ranked with less importance. Flood Mitigation has mixed priorities.

17. **Are you willing to support potential increases in fees to support transportation maintenance/improvement projects in Clay County such as Road Maintenance/Improvement, New Road Construction, Bridge Maintenance/Replacement, Flood Mitigation, Bicycle/Pedestrian/Trails, Bus/Transit, and Safety?**

Many of our survey respondees were favorable in the support of higher fees for transportation maintenance/improvement projects in Clay County, however this survey may skew towards people who support transportation, and may not reflect this if taken to a vote in Clay County.

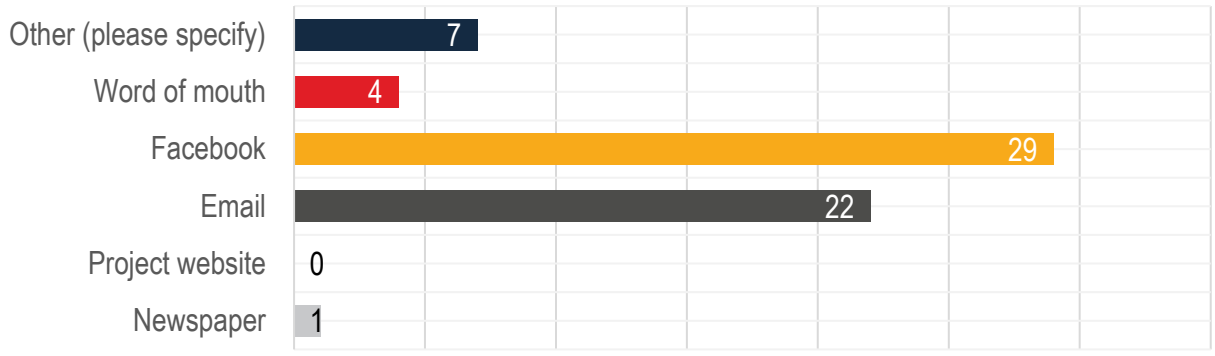
18. **How would you like Clay county's transportation system to look in the next 20 years? Please describe.**

Bike & Pedestrian infrastructure (11)	• More bike lanes and safer. • I would like Clay County to have made significant progress toward Complete Streets where everyone can safely use the transportation system. I'd be excited to see connected bicycle trails, protected bicycle lanes, and public transit connecting people to employment opportunities. More info on Complete Streets here: https://www.transportation.gov/mission/health/complete-streets • I would like Vermillion to be a walkable city. I would like pedestrians and people bicycling to be the priority over people who are driving. • I would like to see wider, level, well constructed sidewalks throughout the town. • Would love to see better walking/biking trails, and some better repairs to Rural University/Greenfield. • I expect bike lanes to appear on main roads, possibly more trails as well for biking and walking. It would be nice to have traffic streamlined around main roads/schools (Main Street) • More bike trails. More traffic control devices to keep the roadways safer to bike and walk. • Better and extensive bike paths, better mass transit, fewer cars • Better crosswalks. Better bike lanes. • More multimodal efforts. Not so car centric • Safe, with deference to pedestrians!!!
Road and Bridge Infrastructure (9)	• All county roads widened for shoulders. Bridges replaced/repaired • Maintain roads and bridges • Fix bridges • Safe and roads and bridges in good condition • Keep the good roads and don't waste money on a bike path for city people • We need to stick to basics and get them right before we add bike trails, etc. Our county taxes are already exceedingly high compared to neighboring counties for poorer roads—I take extreme issue with that. Where is the money going? • Same but better roads • All paved roads. • Since this town is so into the colleges, why not make the roads bigger to support all this. No parking down town, make an extra parking lot. Make roads bigger, especially on Cherry street.

	Make sure the college kids follow the rules too, because a few of them are probably lucky to be here.
Transit (4)	• More public transportation. • More public transport for those that cannot drive. There are a number of those in the community that have to wait for the public transport, which can take a long time given the limited number of public transport. • An actual bus with regular stops at regular times would be nice • Greater access & schedules to public transit
Funding (2)	• For the County to take care of ALL structures and tax the district appropriately to pay for it. Our roads and bridges are awful. Closing a road is not the solution to necessary bridge repair or replacement. And townships are I'll equipped to bear the cost, nor should they for travel that supports the whole County and related business travel. • I believe if the county and townships worked together on rural roads improvements could be made. Right now it doesn't appear that townships have the funds to maintain the roads as they should be
Flooding (1)	• Pass more floodwater on the vermillion ;otherwise no change.
Multiple and Various Improvements (6)	• Better condition and safer • Safe and efficient. • bridges replaced on roads that have been closed Bike/hiking connecting vermillion trails to Clay county park trails • Well maintained, including township roads. Better lighting, potentially using solar and LED systems. • Green circle with a way to run a marathon or bike for hours to view wildlife and greenspace. Ways to ride horse, walk or bike from towns and activities within Clay County. Charging stations in Westreville and other Clay County towns for electric cars. • Improved bike/walking trail system, more gravel roads changed to paved roads in Vermillion (Luxemberg street), complete carr street at north end of town
No Response (9)	• Unsure • I am not sure • I really don't know. • X • No comment. • X • No • NA • Idk

The responses are varied. Bike/Ped infrastructure and Road/Bridge infrastructure received the most attention when it comes to a vision of the transportation system 20 years from now.

19. How did you learn about this online survey?



20. If you would like to receive public meeting notices directly, please write your name and email address.

21. Would you like to answer 5 more questions to better inform the Clay County Master Transportation Plan?

Positive response to this question indicates the respondents felt the survey was worth their time.

22. **Are there specific areas where you would like to see additional or improved transit facility access in Clay County?**

Yes 13 (25%)	No 39 (75%)

Rural Services (3)	• Country • County wide. Vermillion. • My blind mother in rural beresford would love options.
Connect Town centers (2)	• Helping commuters get to and from Vermillion from surrounding towns and Sioux Falls/Sioux City if possible • Wakonda to Vermillion
Vermilion (2)	• .n Vermillion, it would be nice to see an actual transit route. I know cost is a factor, but a service on a schedule to plan around would be great. • Downtown Walmart
Access to Recreation (2)	• Improved bike trail system along vermillion river • Local parks
Availability and Restrictions	• More hours available and provide better access with less "rules" to ride.
Other (2)	• Norbeck Street. That bike path is useless there and Cherry street by the college. And downtown. Does the mayor know that she is a laughing stalk of that? No parking. People love that Starbucks.. Scooters and other foodchains are here. Lots of us avoid downtown. Oh park at the courthouse. No lights at dark and if I'm going to eat at the Brickhouse, I'm not walking that fair. Stupid. Even for the older folks. We'll still to food chains on Cherry street. • Lighting on Dakota and Main Street (other than downtown) fix bike trail by Vermillion River

Recommendations for transit services are varied.

23. Are there specific locations where you would like to see additional or improved bike/pedestrian facilities in Clay County?

Yes 29 (55.8%)	No 23 (44.2%)

Vermilion (10)	• I would like there to be a system of bicycle paths/lanes that go around and throughout Vermillion. • Around Vermillion, and safe options for biking to the parks (clay county, and spirit mound) • Main Street • in the city of Vermillion, bike lanes • Vermillion - specifically in the central district • Around Vermillion • Bike and walking paths in and around Vermillion and elsewhere if possible • Norbeck street. They put on there, but how cars can park on that side too. They're in the middle of the street. Lots of drivers get on their tails or honk their horn. Do stupid things, get the consequences. Down town. With all the pots and weird side walk, how can you ride bike? Behind the parked cars? And by the pool. Especially by the four way stop. Those sidewalks are BAD. They have 5Ks coming from that way and people either don't use them because their not kept up. An old guy was running on that, when doing the 5k, and totally biffed it do to the sidewalks being un even. • Everywhere! Main and cherry streets • I do not feel safe crossing streets near campus and Prentis Park. I really hope you add lots more pedestrian yield signs, painted crosswalks, and maybe even raised crosswalks. I would support speed bumps in the residential areas near campus.
Access to Clay County Park and Recreation (5)	• Bike/walk trail to Clay Co park. • extend hiking/biking trail to clay county park. Provide parking and accesses to the Vermillion river for the purpose of launching kayaks and canoes essentially establishing a water trail for recreation • Clay county park • Clay county park • Westreville to Spirit Mound, Spirit Mound to Clay County Park, Westreville to Wakonda
Multiple and Various Improvements (8)	• vermillon river; burbank road • County wide. Should be feasible option to get anywhere, or nowhere in particular—including leisure. • Complete bike path trial on highway 50 to the north of USD • longer trail by the Highway • Both inside vermillion and on paved rural roads. In their current condition, they are unsafe for bicycle and pedestrian traffic • Not specific exactly. But throughout there are a number of streets/avenues that do not have sidewalks, which makes walking in those areas unsafe. • Sharrows/side paths. Signage for bike routes. • I would like to see covered bicycle parking at major businesses and public buildings. I enjoy biking on Highway 19 because of the rumble strip between me and traffic, yet other roads feel unprotected.

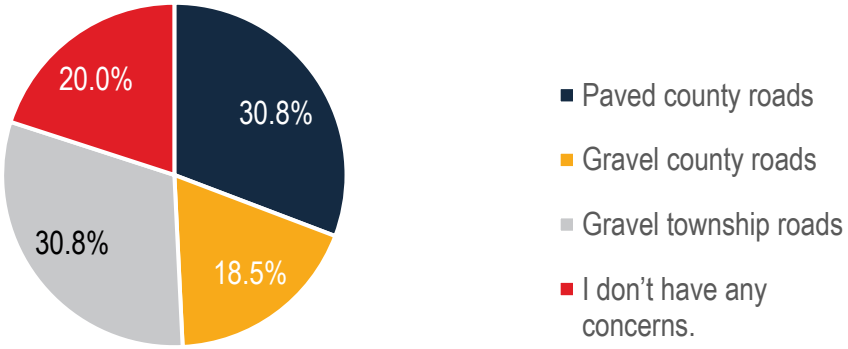
Recommendations for bike/pedestrian facilities are varied, including urban and rural improvements.

24. Are there specific locations where you would like to see additional or improved roadway facilities (beyond typical maintenance and resurfacing) in Clay County?

Multiple and Various Improvements (8)	• Dangerous intersection at 457th and Bluff Rd • Timber Road really needs to be wider • University Rd • Greenfield, University, 316th & 317th street to subdivisions • 309th st paved from Greenfield rd to Frog Creek rd • In Front on City Hall, it should be a 4 way stop. Unless you're okay with, which I'm assuming the city is, having people pull halfway out onto coming traffic to be able to see. When cars are parked, especially in front of that bike shop, you can't see. Heck, you have law enforcement doing that too. Greenfield gravel road. lots of pot holes. Cherry street. • Gravel roads going to the Highline or the river needs maintenance • Side streets

Recommendations improved roadway facilities are varied, mostly rural locations.

25. Which type of roads in Clay County do you have the most concerns about (does NOT include Interstate, State Highway, or Municipal roads)? Select all that apply. If yes, please list your concerns.



Please explain your selection.

Gravel (5)	• Extreme washboards on many roads • All seem to be in dire need of gravel and grading. • grating them • Gravel roads in general are more difficulty to navigate and more significantly affected by weather — rain and snow in particular. • Gravel Roads going to the River or highline need maintenance
Township (2)	• Townships have so little funding that it is hard for them to maintain their roads. • Townships really need the help. A lot more than we need a bike trail/path
Vermillion (2)	• East Main Street • Missouri st
Other (9)	• The County has set a dangerous precedent in refusing to service or replace small structures. Ensuring emergency access and access to direct routes to State or County Highways should be something supported county-wide. • Dangerous • lower speed limt • some county roads are extremely narrow • These are the roads that could be more bicycle friendly. • These roads have the most traffic and need the most attention. • These need to be kept at a minimum standard as seen in neighboring counties—both in basic maintenance and winter maintenance. It's appalling how Clay County compared to Union, Turner and Yankton counties in this respect. Especially in consideration at how how high taxes compare to theirs. • Between it being so dry, lots of cracks and holes on the gravel roads. Do to plows, bumpy roads on the paved road. But actually the county does better than the City roads. I hear that a lot of people. City just doesn't care, she cares more about her imagine than her people. It shows. • PAVED AND GRAVEL ARE WHAT I DRIVE ON

Concerns about Clay County and township roads are varied, with gravel maintenance/improvements being a primary comment.

26. Do you have any other comments or ideas about the Clay County transportation network over the next 20 years that you haven't addressed in any of the previous questions?

No (12)	• N/A • No • No • No • No Thank You • No • No • None • X • No • No • No
Other (3)	• Helping residents change their habits toward more active and shared transportation would require concerted promotion and education. I hope the County will consider this social/cultural dimension in addition to the needed infrastructure improvements. • Bus stops? maybe around town? If kids are riding them. • Can we add waysides or greenspace along Clay Creek or other future bike paths?

Responses were minimal indicating that respondents felt their primary concerns were already addressed with previous responses.

CLAY COUNTY MASTER TRANSPORTATION PLAN

PUBLIC MEETING #1

Existing Conditions Review 4.11.22

Ulteig
We listen. We solve.

Agenda

- Introductions
- Plan Overview
- Study Update
- Existing Conditions
- Project Website and Public Survey
- Next Steps and Action Items
- Open Discussion

Introductions

- Agency Partners: Clay County, SDDOT, FHWA
- Study Advisory Team:
  - Clay County (5 representatives)
  - SDDOT (5 representatives)
- Consultant: Ulteig

Study Participants

Clay County, South Dakota

SD DOT

U.S. Department of Transportation
Federal Highway Administration

Ulteig

Plan Overview

Ulteig

What is a Master Transportation Plan (MTP)?

» A 20-year planning document that will serve as a guide for the County's future transportation network for all modes of travel

» The Master Transportation Plan examines the following:
- Safety
- Infrastructure
- Operations

Study Update

Ulteig

We are here

WINTER 2021-2022	SPRING 2022	FALL 2022	WINTER 2022
Project Kick-off Data Collection Existing Conditions Inventory	Public Meeting #1 (Identify Issues) Project Website Standards Development Future Needs Assessment	Public Meeting #2 (Share Findings) Incorporate Public Input Draft Report	Present to Clay County Commission Final Report

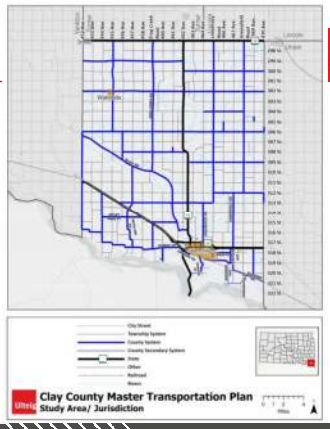
Study Process

Ulteig

We are here

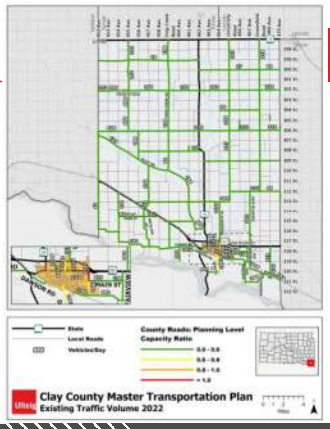
Review of Baseline Conditions and Mapping

Study Area



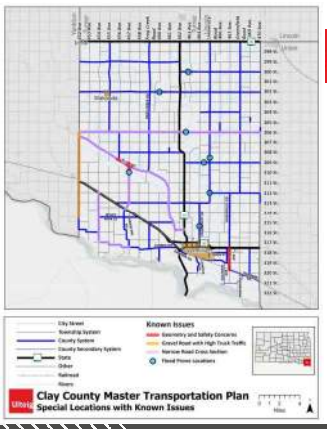
Review of Baseline Conditions and Mapping

2022 Traffic Volumes



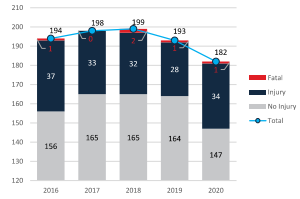
Review of Baseline Conditions and Mapping

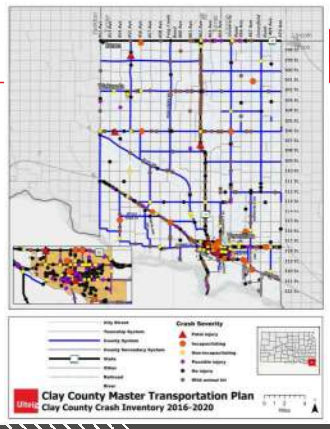
Special Locations with Known Issues



Review of Baseline Conditions and Mapping

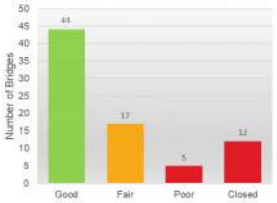
Crash Inventory

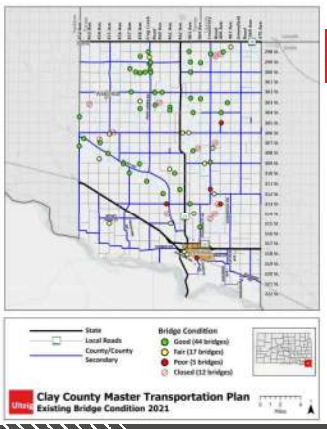




Review of Baseline Conditions and Mapping

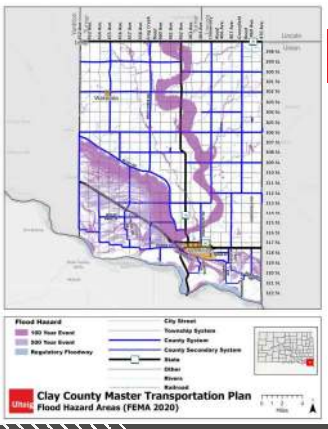
Bridge Condition





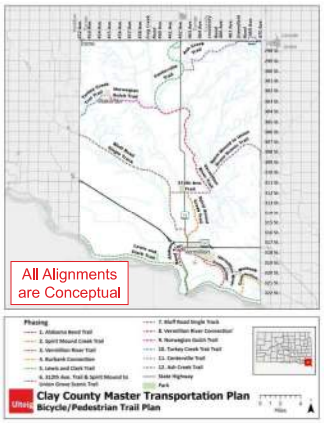
Review of Baseline Conditions and Mapping

Flood Hazard Areas (FEMA 2020)



Review of Baseline Conditions and Mapping

Bicycle & Pedestrian Trails Plan



Project Website

ulteig.com/claycountymtp/

Interactive Map! (Leave Comments)

Public Survey – Leave Feedback!

Help contribute to your MTP by identifying issues and needs that are not readily apparent.

Deadline to take survey is April 25, 2022

ACTION ITEMS

- Direct discussion with the Project Team today
- Internet-Based Survey Questionnaire
- Internet-Based Interactive Map
- Written Comments
  - Comment sheets are provided in the meeting room
  - Comments can also be submitted on the project website
- Deadline for survey, interactive map comments, and written comments is April 25, 2022

NEXT STEPS

- Identify Issues and Needs
- Standards Development
- Future Needs Assessment
- Public Meeting #2 in Fall 2022
- Incorporate Public Input
- Draft Report
- Present to Clay County Commission
- Final Report in Winter 2022

Thank You!

Study Website

ulteig.com/claycountymtp/

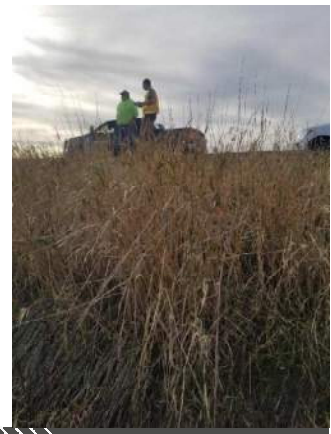
- Study Documents
- Project Updates
- Public Input

Project Managers

- SDDOT
  - Steve Gramm (Steve.Gramm@state.sd.us)
- Consultant Team
  - Will Kerns (Will.Kerns@Ulteig.com)
  - Paul Deutsch (Paul.Deutsch@Ulteig.com)

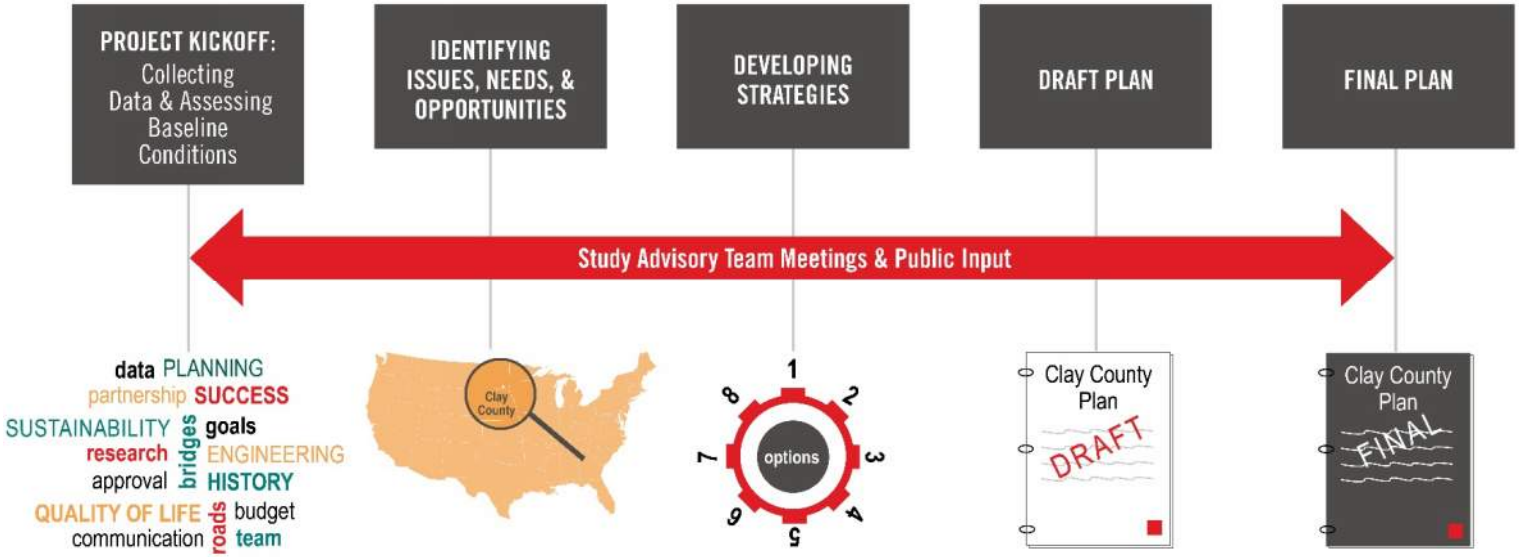
ulteig.com/claycountymtp/

The remaining time is an informal open house until 7:00 PM. Please use this time to explore the exhibits, ask questions, and leave feedback.



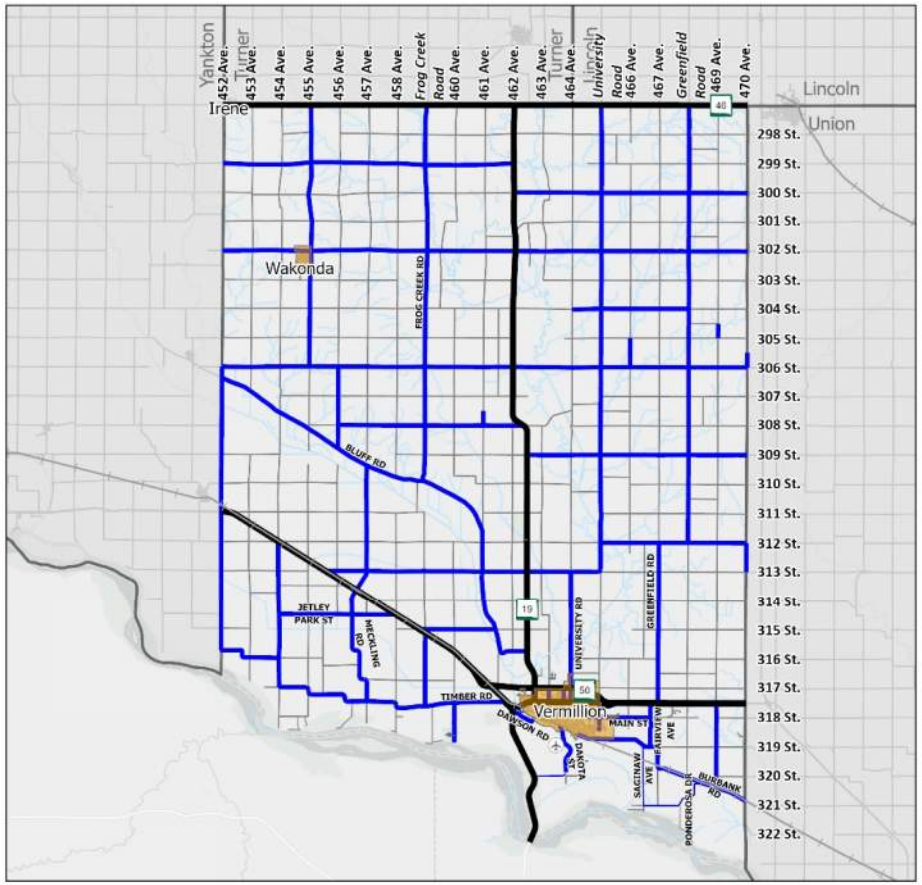
CLAY COUNTY MASTER TRANSPORTATION PLAN

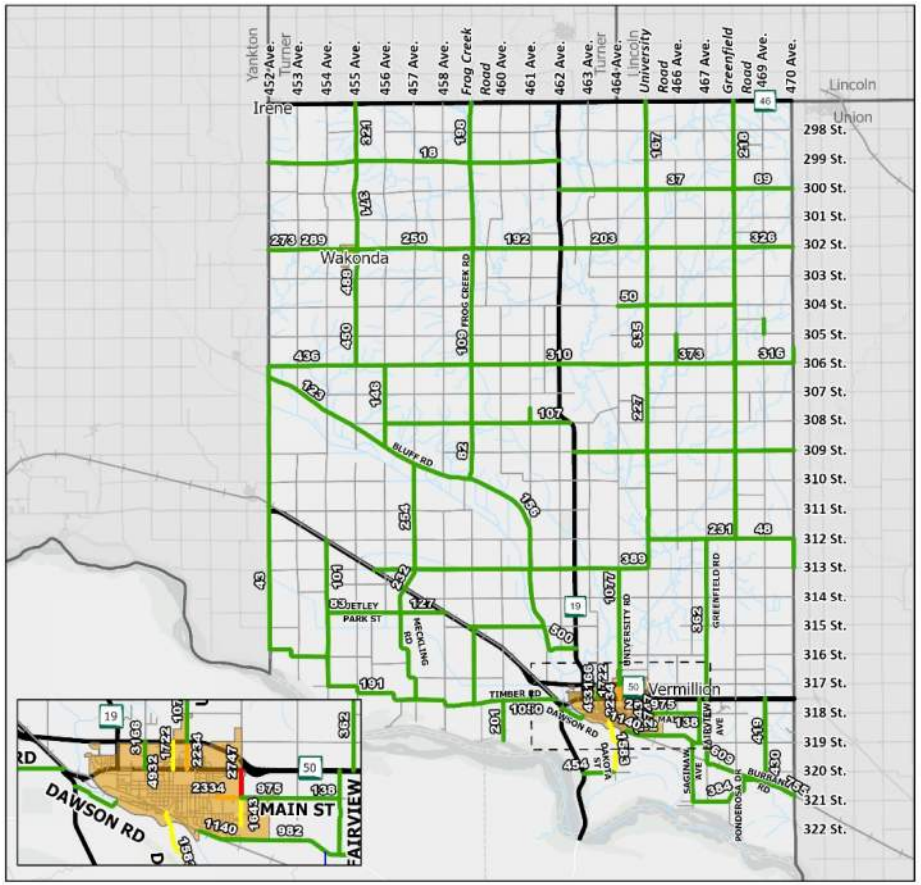
STUDY PROCESS



PATH TO YOUR NEW MASTER TRANSPORTATION PLAN

STUDY AREA AND EXISTING TRAFFIC VOLUME





City Street
Township System
County System
County Secondary System
State
Other
Railroad
Rivers

Clay County Master Transportation Plan
Study Area/ Jurisdiction

0 1 2 4 Miles N

State
Local Roads
Vehicles/Day

County Roads: Planning Level Capacity Ratio
0.0 - 0.6
0.6 - 0.8
0.8 - 1.0
> 1.0

Clay County Master Transportation Plan
Existing Traffic Volume 2022

0 1 2 4 Miles N

SPECIAL LOCATIONS WITH KNOWN ISSUES

457 Avenue: Narrow road, narrow structure and culvert parapets

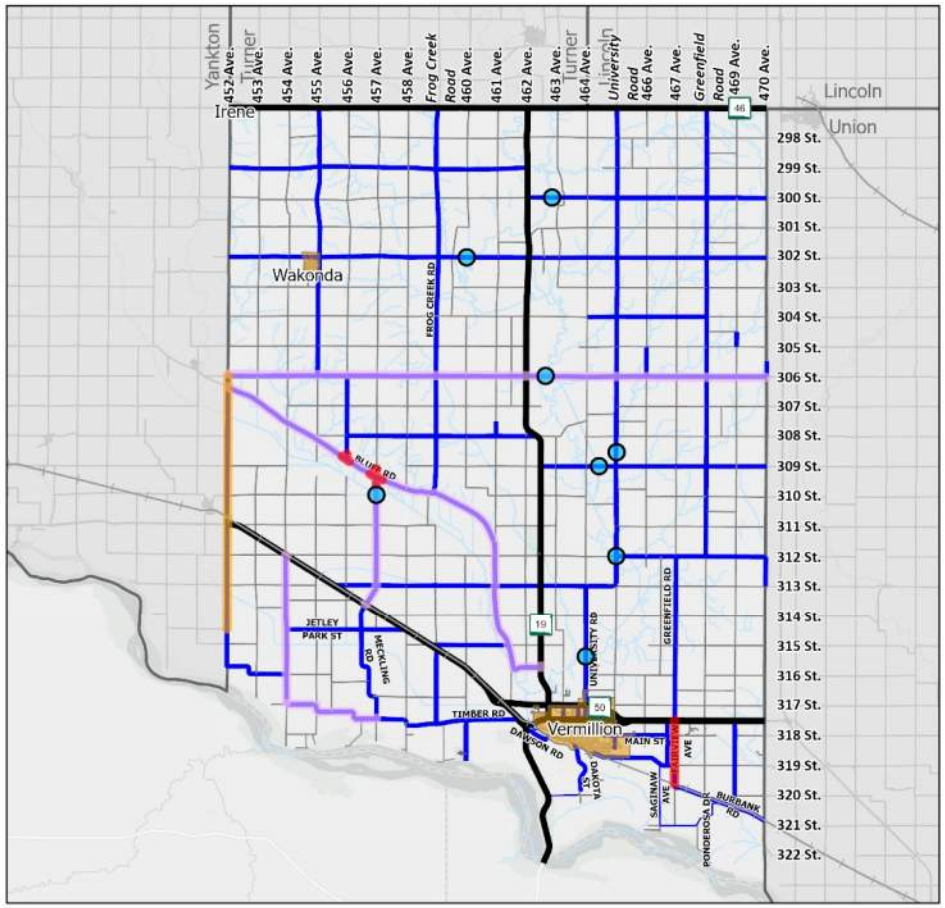
Fairview Avenue: Road geometry, safety concerns

Timber Road: Narrow road, steep inslopes

Bluff Road & 456 Avenue: Intersection geometry, safety concerns

452 Avenue: Gravel road with high truck traffic

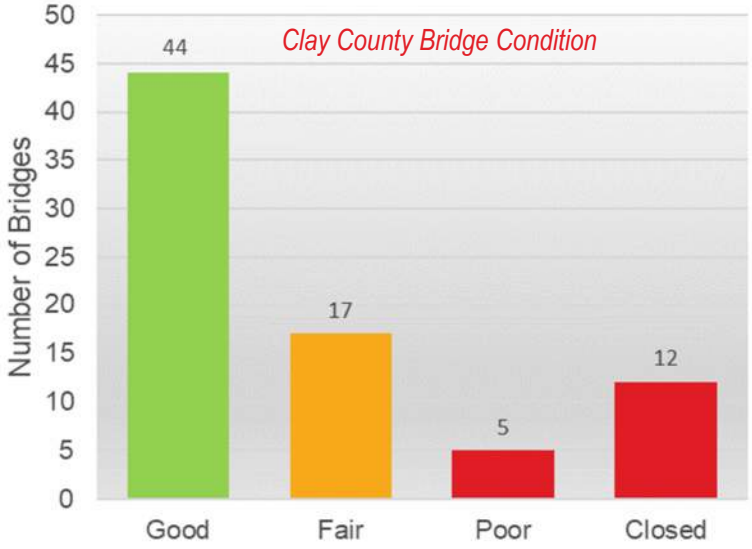
Bluff Road & 457 Avenue: Intersection geometry, safety concerns

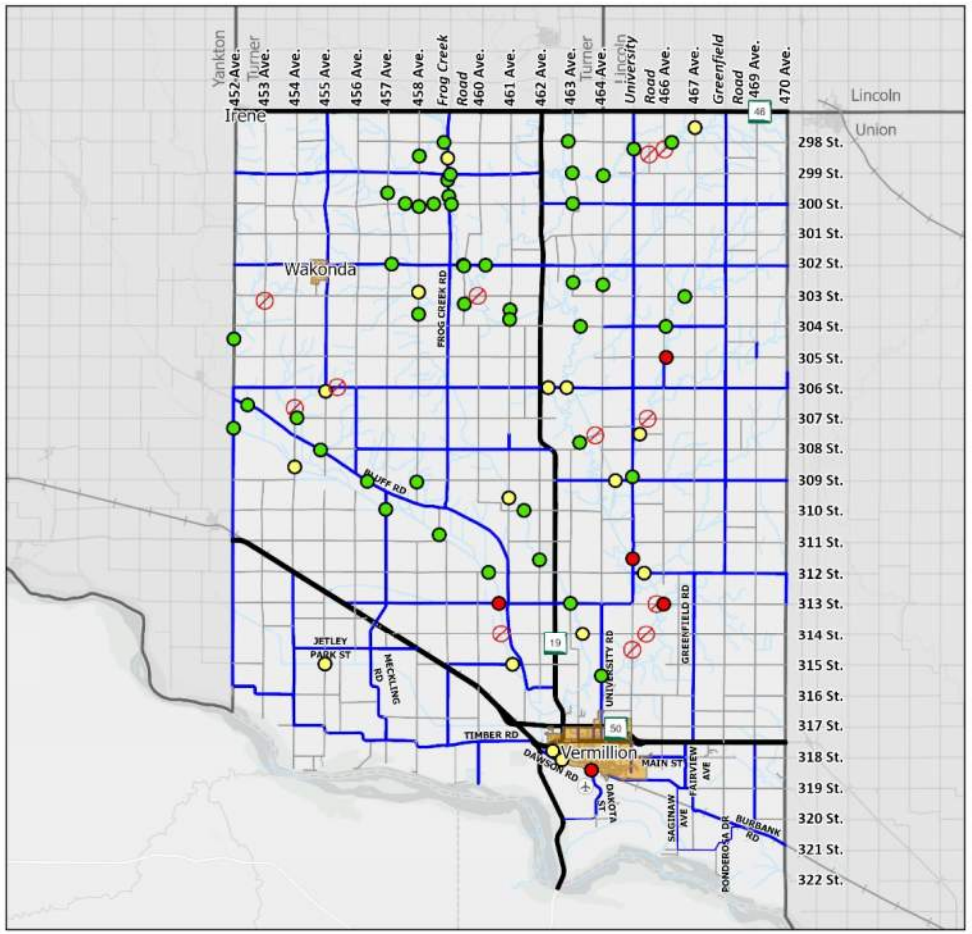


EXISTING BRIDGE CONDITIONS

Clay County owns and maintains 78 bridge structure crossings, and bridge inspections are conducted every 2 years. As a result of bridge inspections, the condition of bridges falls under one of three categories: Good, Fair, or Poor. Most of Clay County bridges are in Fair or Good condition (78%), but 17 bridges are currently in Poor condition (6%) or Closed (15%). Open bridges in Poor condition are structurally deficient, and have short or unknown remaining service lives, likely requiring high-cost repairs or replacement. Comparatively, in all of South Dakota, 25% of all county-owned bridges are in Poor condition.

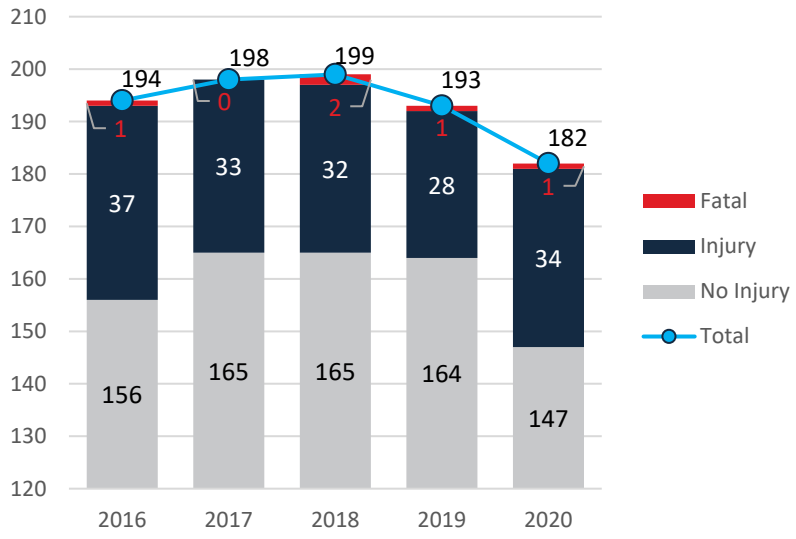
At current funding levels, Clay County faces a difficult challenge to maintain all bridges in a state of good repair.





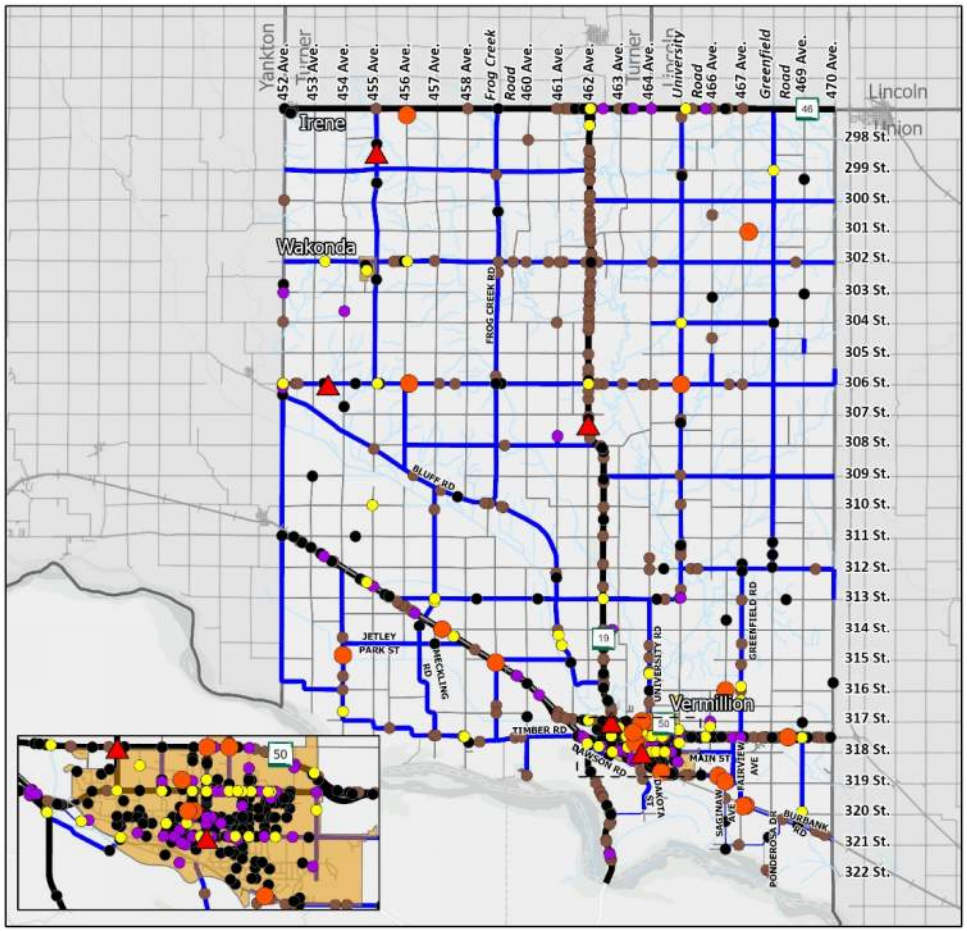
CRASH HISTORY

Clay County Crash Trends (2016-2020)

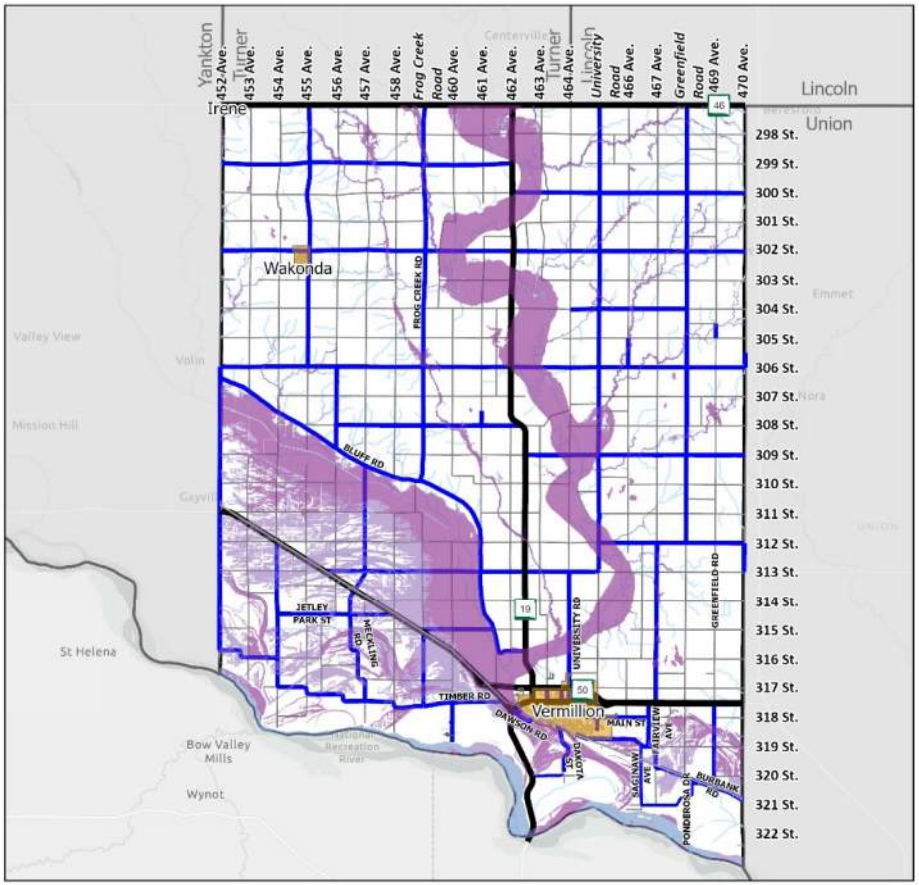


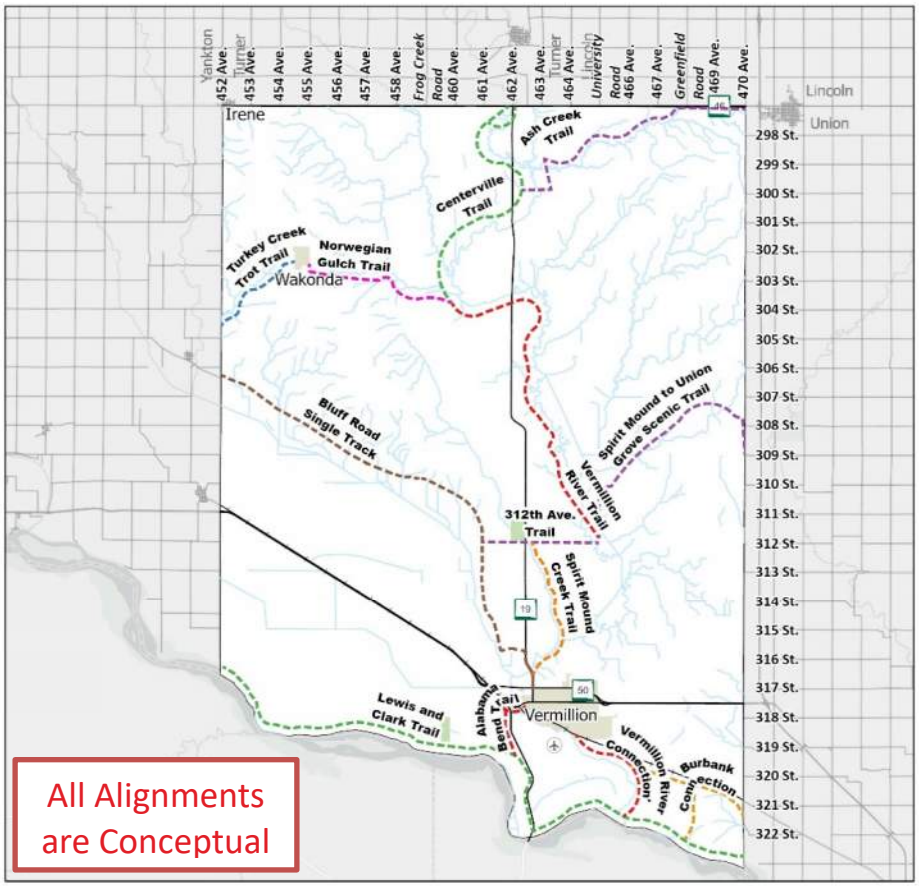
Clay County Crash Types (2016-2020)

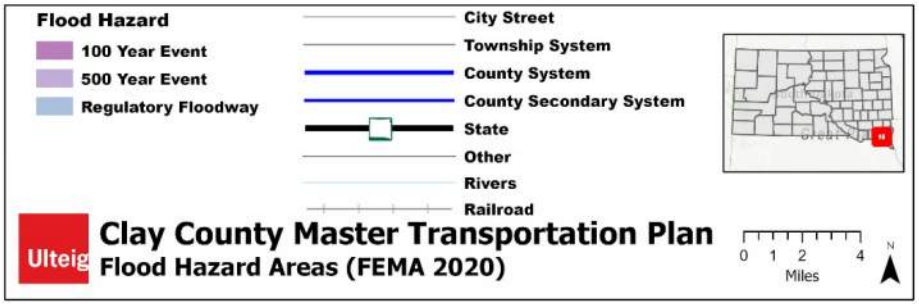
Manner of Collision	Total Crashes	Serious Injury	Fatal Injury	Fatal/Serious Crash Rate
Wild Animal	325	1	0	0.3%
Angle	208	8	1	4.3%
1 Motor Veh - Ran off rd.	154	11	4	9.7%
Rear-End	99	0	0	0.0%
Parked Motor Vehicle	84	0	0	0.0%
1 Motor Veh - Other	50	1	0	2.0%
Sideswipe Same Dir.	27	0	0	0.0%
Sideswipe Opp. Dir.	9	0	0	0.0%
1 Motor Veh - Pedestrian	8	1	0	12.5%
Head-On	1	0	0	0.0%
Rear-To-Rear	1	0	0	0.0%
Total	**966**	**22**	**5**	**2.8%**



FLOOD HAZARD MAP AND BICYCLE & PEDESTRIAN TRAIL PLAN







GETTING INVOLVED

STAY CONNECTED

Receive updates and announcements by visiting our website and submitting your email address: ulteig.com/claycountymtp/

STAY TUNED FOR PUBLIC MEETING #2

Public Meeting #2 is scheduled for Fall 2022. A public notice will be posted in the local newspapers.
Add your email address on the comment form to receive a direct invitation.

INTERNET SURVEY QUESTIONNAIRE

The internet survey is a great tool utilized early in transportation plan development process.
Please compete the survey to share your experience using the Clay County Transportation Network. The deadline to complete the survey is April 25, 2022.

INTERACTIVE MAP

The interactive map is a great way to locate any specific comments or concerns using an online GIS application.
On the project website, mark the location on the map with a pin or line, write your comment in the empty comment field, and submit.

LEAVE A COMMENT

If you have additional comments about the project, please fill out the comment form on the project website.

If you have and direct questions or concerns, please contact one of the project managers listed below:

Steve Gramm (Steve.Gramm@state.sd.us) or Will Kerns (William.Kerns@ulteig.com)

SD DEPARTMENT OF TRANSPORTATION

Clay County, South Dakota

U.S. Department of Transportation Federal Highway Administration

Ulteig

AFFIDAVIT OF PUBLICATION

PLAIN TALK

ULTEIG
5575 DTC PARKWAY SUITE 200
GREENWOOD VILLAGE CO 80111

STATE OF SOUTH DAKOTA
COUNTY OF CLAY

MICHELE SCHIEVELBEIN, BEING FIRST DULY SWORN ON OATH DEPOSES AND SAYS THAT (S)HE IS THE ADVERTISING DIRECTOR OF YANKTON MEDIA INC, A CORPORATION, THE PRINTER AND THE PUBLISHER OF THE PLAIN TALK, A LEGAL WEEKLY NEWSPAPER PUBLISHED AND CIRCULATED IN THE CITY OF VERMILLION, SAID COUNTY AND STATE, AND ONE OF THE OFFICIAL NEWSPAPERS OF THE SAID COUNTY OF FACTS STATED IN THIS AFFIDAVIT; THAT THE ANNEXED
CLAY COUNTY TRANS. MASTER

TAKEN FROM THE PAPER, IN WHICH IT WAS LAST PUBLISHED IN THE NEWSPAPER ON THE 1st DAY OF April, 2022
THAT THE FULL AMOUNT OF THE FEE CHARGED FOR THE PUBLICATION OF SAID NOTICE TO WIT $544.00 ENSURES TO THE BENEFITS OF THE PUBLISHER OF SAID NEWSPAPER AND THAT NO AGREEMENT AND UNDERSTANDING FOR THE DIVISION THEREOF HAS BEEN MADE WITH ANY OTHER PERSON, AND THAT NO PART THEREOF HAS BEEN AGREED TO BE PAID TO ANY PERSON WHOMSOEVER.

PUBLISHED ON: 03/25/2022 04/01/2022

FILED ON: 04/01/2022

Michele Schievelbein

SUBSCRIBED AND SWORN TO BEFORE ME THIS 1st DAY OF April, 2022

Cassandra Bern

NOTARY PUBLIC, SOUTH DAKOTA
MY COMMISSION EXPIRES 07/04/2026

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION
AND
CLAY COUNTY
NOTICE OF PUBLIC OPEN HOUSE / INFORMATION MEETING
FOR
CLAY COUNTY MASTER TRANSPORTATION PLAN

Date: April 11, 2022
Time: 5:30 PM to 7:00 PM
Place: Clay County 4-H Center
515 High St.
Vermillion, SD 57069
Website: www.ulteig.com/claycountymtp/

The South Dakota Department of Transportation (SDDOT), in conjunction with Clay County, will hold an open house style public information meeting on the date listed above to receive public input on the Clay County Master Transportation Plan. The open house will be informal allowing for one-on-one discussion with the study team. This public meeting will introduce the study scope and background, as well as present a review of baseline conditions. An internet-based survey questionnaire is also available on the study website to help identify issues and needs.

Area residents and commuters are encouraged to attend and participate in the study. The major outcome of this public outreach effort is to better understand the current and future issues and needs of the transportation network in Clay County. As a result, priorities will be identified, and strategies can be developed to address those issues and needs as part of a long range, 20-year plan.

A brief presentation will take place at 5:45 PM. SDDOT, Clay County, and consultant staff will be available after the presentation to discuss the study and answer questions

During this time, you will also have the opportunity to present written comments.

Those who cannot attend this public meeting in person may also view the meeting materials on the project website, which will be updated with the meeting materials presented at the public meeting no later than April 15, 2022. Comments and questions can also be submitted through the project website.

Notice is further given to individuals with disabilities that this open house is being held in a physically accessible place. Any individuals with disabilities who will require a reasonable accommodation in order to participate in the open house should submit a request to the department's ADA Coordinator at 605-773-3540 or 1-800-877-1113 (Telecommunication Relay Services for the Deaf). Please request the accommodations no later than 2 business days prior to the meeting to ensure accommodations are available.

Questions and comments regarding the study may be directed to Steve Gramm at (605) 773-3281 (steve.gramm@state.sd.us) or Paul Deutsch at (605) 323-6023 (paul.deutsch@ulteig.com) or Will Kerns at (720) 873-5762 (will.kerns@ulteig.com).

Comments will be accepted until April 25, 2022, and may be submitted online through the study website, or directly to one of the project representatives.

Notice published twice at the total approximate cost of $544.00

AFFIDAVIT OF PUBLICATION

YANKTON DAILY PRESS AND DAKOTAN

ULTEIG
5575 DTC PARKWAY SUITE 200
GREENWOOD VILLAGE CO 80111

STATE OF SOUTH DAKOTA
COUNTY OF YANKTON

KELLY HERTZ, BEING FIRST DULY SWORN ON OATH DEPOSES AND SAYS THAT (S)HE IS THE MANAGING EDITOR OF YANKTON MEDIA INC, A CORPORATION, THE PRINTER AND THE PUBLISHER OF THE YANKTON DAILY PRESS AND DAKOTAN, A LEGAL DAILY NEWSPAPER PUBLISHED AND CIRCULATED IN THE CITY OF YANKTON, SAID COUNTY AND STATE, AND ONE OF THE OFFICIAL NEWSPAPERS OF THE SAID COUNTY OF FACTS STATED IN THIS AFFIDAVIT; THAT THE ANNEXED CLAY COUNTY TRANS. MASTER

TAKEN FROM THE PAPER, IN WHICH IT WAS LAST PUBLISHED IN THE NEWSPAPER ON THE 1st DAY OF April, 2022
THAT THE FULL AMOUNT OF THE FEE CHARGED FOR THE PUBLICATION OF SAID NOTICE TO WIT $587.20 ENSURES TO THE BENEFITS OF THE PUBLISHER OF SAID NEWSPAPER AND THAT NO AGREEMENT AND UNDERSTANDING FOR THE DIVISION THEREOF HAS BEEN MADE WITH ANY OTHER PERSON, AND THAT NO PART THEREOF HAS BEEN AGREED TO BE PAID TO ANY PERSON WHOMSOEVER.

PUBLISHED ON: 04/01/2022

FILED ON: 04/01/2022

SUBSCRIBED AND SWORN TO BEFORE ME THIS 1st DAY OF April, 2022

NOTARY PUBLIC, SOUTH DAKOTA
MY COMMISSION EXPIRES 07/04/2026

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION
AND
CLAY COUNTY
NOTICE OF PUBLIC OPEN HOUSE / INFORMATION MEETING
FOR
CLAY COUNTY MASTER TRANSPORTATION PLAN

Date: April 11, 2022
Time: 5:30 PM to 7:00 PM
Place: Clay County 4-H Center
515 High St.
Vermillion, SD 57069
Website: www.ulteig.com/claycountymtp/

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Notice published once at the total approximate cost of $587.20

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SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND CLAY COUNTY
NOTICE OF PUBLIC OPEN HOUSE / INFORMATION MEETING FOR
CLAY COUNTY MASTER TRANSPORTATION PLAN

Date: April 11, 2022 • Time: 5:30 PM to 7:00 PM

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Notice published twice at the total approximate cost of $

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of said newspaper; that no agreement of understanding for the division thereof has been made with any other person, that no part therefore has been agreed to be paid to any person whomsoever; and that the fees charged for the publication thereof are:

DOLLARS ($ 180 00)

(x) Allyson Hill, Allyson Hill

Subscribed and sworn to before me this 21st day of April, 2022

Notary Public
My commission expires 03/12/2025.

Cheri O'Dell
SEAL NOTARY PUBLIC SOUTH DAKOTA SEAL

AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA
SS

COUNTY: UNION

CITY: BERESFORD

NEWSPAPER: BERE

Allyson Hill, beir
BERESFORD REPUBL
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DOLLARS $ 90.00

X Allyson Hill, Allyson Hill

Subscribed and sworn to before me this 31st day of April, 2022.

Cheri O'Dell

Notary Public

My commission expires 03/12/2025.

Cheri O'Dell
SEAL NOTARY PUBLIC SOUTH DAKOTA SEAL

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND CLAY COUNTY
NOTICE OF PUBLIC OPEN HOUSE / INFORMATION MEETING FOR
CLAY COUNTY MASTER TRANSPORTATION PLAN

Date: April 11, 2022 • Time: 5:30 PM to 7:00 PM

Place: Clay County 4-H Center, 515 High St., Vermillion, SD 57069

Website: www.ulteig.com/claycountymtp/

The South Dakota Department of Transportation (SDDOT), in conjunction with Clay County, will hold an open house style public information meeting on the date listed above to receive public input on the Clay County Master Transportation Plan. The open house will be informal allowing for one-on-one discussion with the study team. This public meeting will introduce the study scope and background, as well as present a review of baseline conditions. An internet-based survey questionnaire is also available on the study website to help identify issues and needs.

Area residents and commuters are encouraged to attend and participate in the study. The major outcome of this public outreach effort is to better understand the current and future issues and needs of the transportation network in Clay County. As a result, priorities will be identified, and strategies can be developed to address those issues and needs as part of a long range, 20-year plan.

A brief presentation will take place at 5:45 PM. SDDOT, Clay County, and consultant staff will be available after the presentation to discuss the study and answer questions. During this time, you will also have the opportunity to present written comments.

Those who cannot attend this public meeting in person may also view the meeting materials on the project website, which will be updated with the meeting materials presented at the public meeting no later than April 15, 2022. Comments and questions can also be submitted through the project website.

Notice is further given to individuals with disabilities that this open house is being held in a physically accessible place. Any individuals with disabilities who will require a reasonable accommodation in order to participate in the open house should submit a request to the department's ADA Coordinator at 605-773-3540 or 1-800-877-1113 (Telecommunication Relay Services for the Deaf). Please request the accommodations no later than 2 business days prior to the meeting to ensure accommodations are available.

Questions and comments regarding the study may be directed to Steve Gramm at (605) 773-3281 (steve.gramm@state.sd.us) or Paul Deutsch at (605) 323-6023 (paul.deutsch@ulteig.com) or Will Kerns at (720) 873-5762 (will.kerns@ulteig.com).

Comments will be accepted until April 25, 2022, and may be submitted online through the study website, or directly to one of the project representatives.

Notice published twice at the total approximate cost of $

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APPENDIX C
PUBLIC MEETING #2 SUMMARY

PUBLIC MEETING #2 SUMMARY

Clay County Master Transportation Plan

Public Meeting #2 was open for public comment from October 5 through October 19, 2022.

Public Meeting #2 was hosted at the Clay County 4-H Center in Vermillion, SD, on October 5, 2022. The Stakeholder meeting was hosted at the same location in the afternoon of the same day. Public comments were accepted until October 19, 2022. Stakeholders identified by the Study Advisory Team were emailed direct invitations to the meetings, and public advertisements were posted in the following Clay County newspapers between September 15 and September 23, 2022

- *The New Era*
- *Vermillion Plain Talk*
- *Beresford Republic*
- *Yankton Daily Press & Dakotan*

Meeting Schedule

3:00 PM to 4:00 PM – Stakeholder Meeting
5:30 PM to 7:00 PM – Public Meeting #2

Attendance

Stakeholders – 2
Public – 1
Study Advisory Team and Staff – 4

Summary of Materials Provided

Exhibits were displayed for attendees to browse. A presentation was done using PowerPoint. Attendees were asked to record their presence on the sign-in sheet and leave optional comments on the comment cards provided.

Comments and Questions

During the meetings, attendees commented and asked questions about the study and materials presented.

<u>Comments During Stakeholder and Public Meetings on October 5, 2022:</u>

- What is microsurfacing?
    - *Response: Microsurfacing is a non-structural rehabilitation that is effective at sealing the pavement surface to help prolong the life of the road. The county commissioner present noted that it is more cost effective over the long term compared to chip seals.*

- How much did the fleximat that is used now cost?

  - *Response: The cost was $75,000 and installed by county forces, and it is difficult to get grant funding for these floodway treatments. Steve Gramm of SDDOT said that there may be funding in the future from the PROTECT grant.*

- From the survey, was there a consensus on which roads were in the worst condition?
  - Response: There were some comments about particular roads but none of them were called out by multiple participants indicating a consensus.

- Clay County doesn't maintain the county roads within Vermillion, correct?
  - *Response: Clay County does not maintain them currently, and this study recommends formal jurisdictional transfer of all county roads within city limits.*

- Could more kayak access be implemented on the river?
  - *Response: It is believed there are currently two accesses and the rest is mostly private access only.*

- Which roads to cyclists prefer to use?
  - *Response: Adventure Cycling Association has maps for bike tourists. They prefer roads with little traffic, even if shoulders are not provided. They do not like to bike along roads with lots of traffic and high speeds, even if shoulders are provided for biking.*

- Why the name Alabama Bend Trail?
  - *Response: The Alabama Bend Trail might be named after a ship wreckage that is sometimes visible in the Missouri River but is upstream from where the trail is shown on the map. The old ship wreck is close to Goat Island on the Nebraska side of the river.*

- How do you close a trail for hunting?
  - *Response: You can use signs, close gates, attempt to enforce. However, some grants for trails require 24-hour year-round access and an explanation of how you will provide that, including snow removal for the TA grant program (SDDOT Transportation Alternatives Program).*

- This would be a huge undertaking as a non-profit trying to build a trails network.
  - *Response: You can start out small and attempt to gain momentum. It does not have to be all at once. The pros out will outweigh the cons. Even if only one trail happened, it still is a win. The Lewis and Clark Trail has great potential for funding.*

<u>Comments submitted outside of the meetings:</u>

- I'm interested in your updates. I don't like driving from Meckling north as you point out, the road is so narrow and ditches so deep. And the surface has been patched so many times, it's awful.
  - *Response: This corridor is a known issue by the County and is part of the corridor improvements shown in the proposed enhancement projects, particularly to widen shoulders if funding is available.*

- Interactive Map Point: Over Dr should have a connection to the existing bike path to the east in front of Polaris giving us a safe path into town. It could also go west to the Vermillion River.
    - *Response: Connecting Over Dr to Stanford St is approximately 2,400 feet of mostly undeveloped land (outside of City Limits) along SD 50. Potential connections could be achieved as part of SDDOT improvements or if the City annexes the land gap between city limits boundaries. Currently there is no connection to the west, but there is potential if the Vermillion River Trail ever extends along the river as it runs west of the city.*

SIGN-IN SHEET

Clay County Master Transportation Plan

Second Public Meeting – October 5, 2022 (5:30 PM to 7:00 PM)

Clay County 4-H Center – 515 High Street – Vermillion, SD

Name	Organization	City/Address	Email
Paul Deutsch	Ulteig	Sioux Falls	paul.deutsch@ulteig.com
Will Kerns	Ulteig	Denver, CO	Will.Kerns@Ulteig.com
Laura Krause	Ulteig	Minneapolis	Laura.Krause@ulteig.com
max Anderson		Vermillion	maxeandersen@.com
Kevin Brady		109 Austin, Verm	BIKINGBRADY@GMAIL.COM
Richard Hammond	Clay County Commission	25 Prentis Ave Vermillion	ahhhei@gmail.com
Steve Gramm	SDDOT	700 E. Broadway Pierre	Steve.gramm@state.sd.us
Rod Pacey	Clay Co.	Wakonda	Rod.Pacey@clay county sd.org
David Lias	Plain Talk	Vermillion	david.lias@plaintalk.net
Larry McPherson	Clay Co	Vermillion	Larry.McPherson@clay Countysch.org

Comment Sheet

Clay County Master Transportation Plan

Second Public Meeting – October 5, 2022 (5:30 PM to 7:00 PM)

Clay County 4-H Center – 515 High Street – Vermillion, SD

Please use the space below to leave a comment for the project team regarding the Clay County Master Transportation Plan. You may leave a comment on the form below or by submitting a comment on the project website. You also have the option to mail your comments directly. Comments will be accepted until October 19, 2022.

Project Website: https://ulteig.com/claycountymtp/

Mailing Address: Paul Deutsch
Ulteig Engineers, Inc.
5701 South Corporate Place, Suite 1
Sioux Falls, SD 57108

Comment:_____

_____

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Name (optional): _____

Organization (optional): _____

Address (optional): _____

Phone Number (optional): _____

Email Address (optional): _____

Would you like to receive future emails about the Clay County MTP? _____

Ulteig

CLAY COUNTY
MASTER TRANSPORTATION PLAN

SECOND PUBLIC MEETING

Draft Plan Update 10.5.22

Ulteig
We listen. We solve.

Agenda

- Introductions
- Background and Purpose
- Public Feedback Received
- Future Needs Analysis
- Issues and Needs Identified
- Improvements and Projects
- Standards Development
- Next Steps

Introductions

- Agency Partners: Clay County, SDDOT, FHWA
- Study Advisory Team:
  - Clay County (5 representatives)
  - SDDOT (5 representatives)
- Consultant: Ulteig

Study Participants

Clay County, South Dakota

SD DOT

U.S. Department of Transportation
Federal Highway Administration

Ulteig

Background and Purpose

Ulteig

What is a Master Transportation Plan (MTP)?

- A 20-year planning document that will serve as a guide for the County's future transportation network for all modes of travel
- Study Area
  - Clay County and all communities within
  - The focus of the MTP is Clay County owned and maintained roadways and bridges.

Study Update

Ulteig

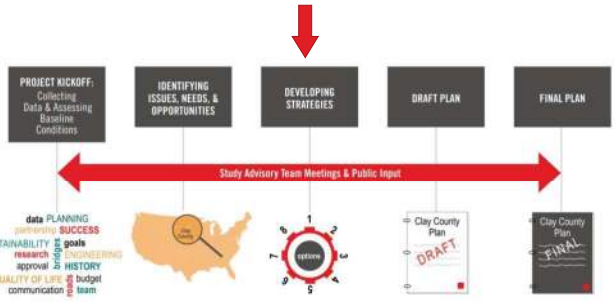
We are here

WINTER 2021-2022	SPRING 2022	FALL 2022	WINTER 2022
• Project Kick-off • Data Collection • Existing Conditions Inventory	• Public Meeting #1 (Identify Issues) • Project Website • Standards Development • Future Needs Assessment	• Public Meeting #2 (Share Findings) • Incorporate Public Input • Draft Report	• Present to Clay County Commission • Final Report

Study Process

Ulteig

We are here



Public Feedback Received

- First Public Meeting held on April 11, 2022
- Stakeholder Meetings
- Internet-Based Survey Questionnaire
- Interactive Mapping
- Comment Forms

Public Survey Results

- The Internet-Based Survey Questionnaire was conducted during the time of Public Meeting #1
  - 26 Questions
  - 63 Surveys were completed (70% of respondents were from Vermillion)
- The questions related to the existing transportation network
  - Travel Preferences
  - Overall Performance
  - Issues and Concerns
  - Prioritization of Specific Types of Improvements
  - General Comments

Public Survey Results

- 88% typically drive alone
- 50% drive over 50 miles per week (27% drive over 100 miles per week)
- 50% walk outdoors 3-7 days per week
- 50% bike at least 1 day per month
- Q10. How would you rate the quality of Clay County transportation infrastructure compared to 5 years ago?

Public Survey Results

- Q16. Rate the following transportation project types in order of importance.

Future Needs Analysis

- Road Conditions and Surfacing Needs
- Bridge Conditions and Replacement Needs
- Crash History
- Special Locations Analysis
- 2045 Capacity Analysis
- Flood Hazard Analysis
- Issues and Needs

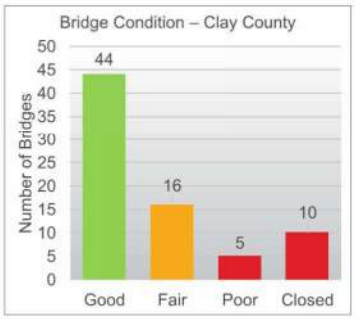
Road Conditions and Surfacing Needs

- Respondents to survey generally replied that Clay County roads (paved and unpaved) are in fair or good condition
- 30% of respondents said the quality of Clay County transportation infrastructure is better or somewhat better than 5 years ago. 16% said it is worse or somewhat worse than 5 years ago.
- Clay County has introduced microsurfacing as a critical element of the roadway maintenance strategy that also continues to rely on chip seals.

Surface Type	Miles	%
Gravel	55.1	22.9%
Bituminous	182.3	75.7%
Concrete	3.4	1.4%

Bridge Conditions and Replacement Needs

- 75 bridges owned by Clay County
- Bridges in Poor Condition are defined as "Structurally Deficient"
  - 20% of Clay County-owned bridges are in Poor Condition (7%) or Closed (13%)
  - (25% of South Dakota county-owned bridges are in Poor Condition)

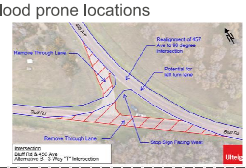


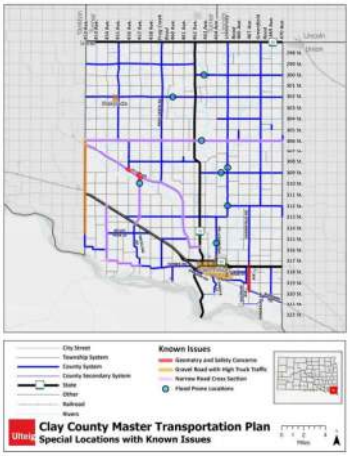
Crash History

- Total crashes fluctuating over time, just below 200 crashes each year
- 34% wild animals
- 5 fatal crashes in 5 years
- 3% severe crashes
  - Fatal or incapacitating

Special Locations Analysis

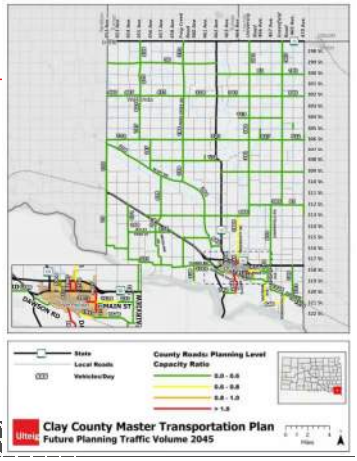
- Special road segments and spot locations were identified in early discussions with Clay County Highway Department as having issues that required specific analysis
  - Geometry and safety concerns
  - Truck traffic
  - Narrow roads
  - Flood prone locations





2045 Capacity Analysis

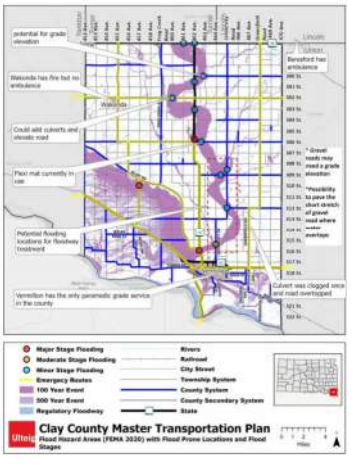
- Based on future planning daily traffic volumes, traffic congestion is not expected to be an issue for the vast majority of county roads
  - Almost all county roads are well below a need for additional traffic lanes
  - Due to development in the urban and suburban areas of Vermillion, future traffic volumes indicate that some roads under Clay County jurisdiction may approach or exceed capacity by the year 2045.



Clay Co. Seasonal Flooding

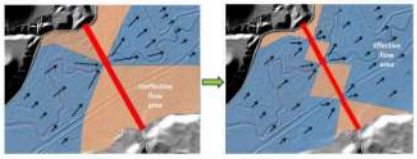
Flood Hazard Analysis

- Seasonal flooding is a critical issue
  - Road closures
  - Damaged roads and drainage structures
  - Impacts to emergency responders, transit providers, school buses, and repair crews



Clay Co. Seasonal Flooding Mitigation Strategies

- A Geomorphic approach recommended for elevated roads above typical flood levels
- Floodways are recommended for low-level roads



Floodway Treatment

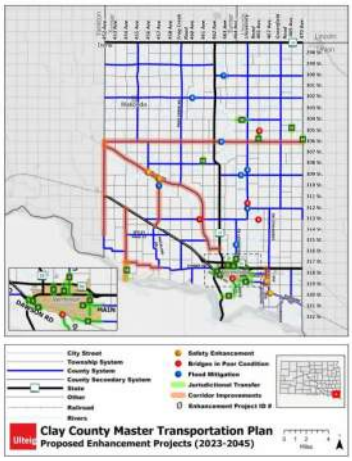
Reinforced shoulders using Flexi-mat

Issues and Needs Identified

- Bridge Replacement
- Road Conditions
- Road Geometry and Safety
- Flooded Roads
- Demand for Bicycle and Pedestrian Infrastructure
- Urban Growth and Development
- Prioritizing Improvements with Available Funding

Improvements and Projects

- Corridor Improvements (County Highways)
- Bridge Improvements
- Enhancement Projects



Corridor Improvements (County Highways)

- Primary Issue/Need Addressed
  - Road Conditions
  - Road Geometry and Safety
  - Demand for Bicycle and Pedestrian Infrastructure
  - Prioritizing Improvements with Available Funding
- Maintaining existing infrastructure is the priority with available funding
  - Preventative Maintenance, Minor and Major Rehab
- The Major Roads Plan prioritizes the most critical county roads
  - Capital Improvements, Support Multimodal Transportation (biking, walking)
  - Reconstruction, Shoulder Widening

Bridge Improvements

- Primary Issue/Need Addressed
  - Bridge Replacement Needs
  - Prioritizing Improvements with Available Funding
- Bridge Replacement Plan
- Expanded Funding sources
  - Applications for BIG funding could help pay for bridge repairs and replacement
  - $1.2 Trillion Infrastructure Investment and Jobs Act (IIJA) will help too!
    - South Dakota is expected to receive $225 million for bridge replacement and repairs over five years.[1]

Top 10 Estimated BIG Scores for Bridges in Clay County*

Structure Number	Location	Bridge Condition	Posted for Load Limits?	ADT (veh/day)	Min. Estimated SDDOT BIG Score**
14-141-080	8.0 S & 14.1 E IRENE SD	Poor	Yes	15	38.6
14-150-006	0.6 S & 15.0 E IRENE	Fair	Yes	25	37.8
14-140-160	7.0 S & 1.1 E OF HUB CITY	Poor	Yes	15	35.5
14-112-090	1.8 W HUB CITY	Fair	Yes	150	29.6
14-030-180	18.0 S & 3.0 E IRENE SD	Fair	Yes	25	21.5
14-130-146	1.2 E & 6.0 N VERMILLION	Poor	No	297	16.6
14-117-214	1.0 S VERMILLION	Poor	No	550	15.9
14-125-120	3.0 S & 0.5 W HUB CITY	Fair	No	97	14.0
14-088-160	0.8 N & 3.8 E MECKLING	Poor	No	125	12.3
14-133-105	10.5 S & 13.3 E IRENE	Fair	No	206	11.8

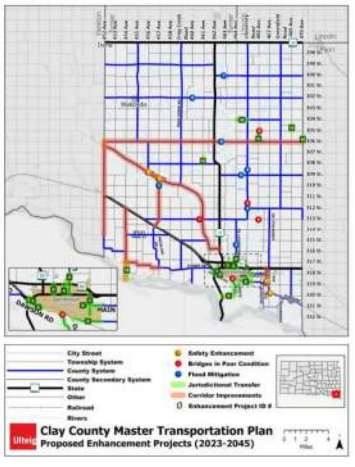
* Bridges must meet eligibility for rehabilitation or replacement BIG funding (Bridge Improvement Grant).

** Up to 20 additional points can be added ("Bid Review Ready" and 50% cost share).

[1] https://www.whitehouse.gov/wp-content/uploads/2021/08/SOUTH-DAKOTA_Infrastructure-Investment-and-Jobs-Act-State-Fact-Sheet.pdf

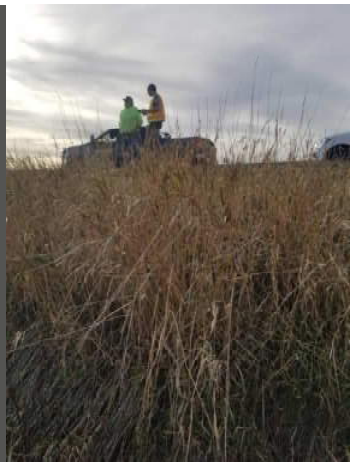
Enhancement Projects

- Primary Issue/Need Addressed
  - Road Geometry and Safety
  - Flooded Roads
  - Urban Growth and Development
  - Prioritizing Improvements with Available Funding
- Future projects address flooding, crash history, narrow roads, roadside hazards, intersection geometry, bridges in poor condition, connectivity, traffic growth, development, heavy vehicles
  - Will be ranked by priority as funding becomes available



Standards Development

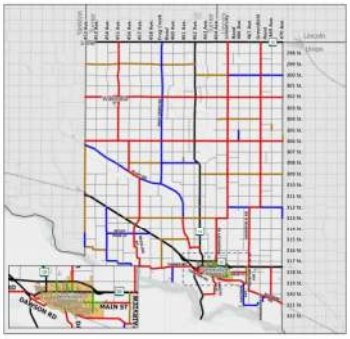
- Major Roads Plan
- Road Design Standards
- Administrative and Development Standards
- Bicycle and Pedestrian Plan



Major Roads Plan

» Prioritizes the most critical county roads
  - Guides future designs and project planning

» Classifications
  - County Paved – Priority Route
  - County Paved
  - County Gravel
  - Local Roads



Road Design Standards

» Modern design standards for road reconstruction

» Guided by the Major Roads Plan
  - County-Paved – Priority Route
  - County Paved
  - County Gravel
  - Local Roads

County Paved – Priority Route

County Paved

Administrative and Development Standards

» Jurisdictional Transfer Policy
  - Candidate roads identified
  - Process guidance
  - Legal Agreement Template

» Surface Type Change Policy Guidelines
  - Guidelines for the conversion of unpaved road to a paved road
  - 10-part framework from the *Gravel Roads & Maintenance Guide*[1]

» Changing Maintenance Designation Guidelines
  - Minimum maintenance or no maintenance
  - Abandonment (road closure or road vacation)

» Access Management Guidelines
  - Access-Location Criteria

» Level of Service Standards
  - For traffic impact study evaluations

[1] FHWA. *Gravel Roads Construction & Maintenance Guide (August 2015).*

Pedestrian/Bicycle Facilities

» Clay County has an existing but somewhat disconnected bicycle, pedestrian, and trails network.

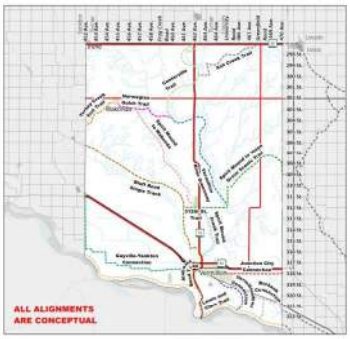
» Public feedback has indicated more demand for these types of facilities, especially where none exist.

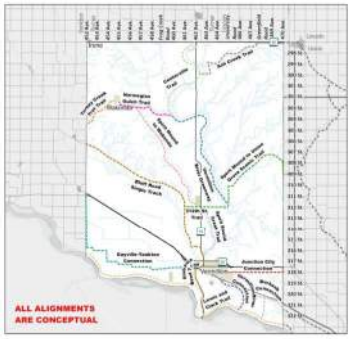
- *"Would like bike paths that connect to destinations, like Spirit Mount, Clay Creek, Wakonda, Clay County Park, or anywhere along the river"*
- *"No shoulder on county roads"*
- *"Not enough trails, only sidewalks"*
- *"Nowhere fun to do it"*
- *"Live in rural Clay County on a County Highway, which does not have shoulders for safe biking"*

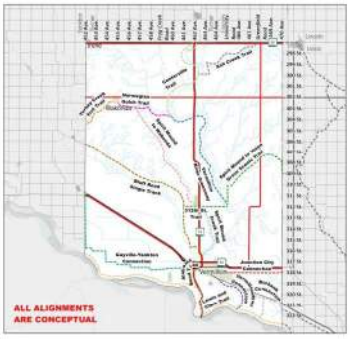
Bicycle and Pedestrian Plan

» Trails Master Plan
  - A comprehensive network of trails
  - Phased implementation
  - Optional surface types and width
    - Loose surface, gravel, crusher fines, asphalt, concrete

» On-Street Bicycle and Pedestrian Accommodations
  - The addition of paved shoulders (according to Major Roads Plan) and Bike Route designation is recommended for select routes on the County Paved – Priority Route system.







Next Steps

- Incorporate Public Feedback
- Draft Report
- Present to Clay County Commission
- Final Report

Public Participation

- Public Feedback Options:
  - Direct Discussion with the Project Team
  - Written Comments
    - Comment sheets provided
    - Comments can also be submitted on the project webpage
      - Map based comments
  - Comment period closes in 2 weeks

Thank You!

Study Website
ulteig.com/claycountymtp/
- Study Documents
- Project Updates
- Public Input

Project Managers
- SDDOT
  - Steve Gramm Steve.Gramm@state.sd.us
- Consultant Team
  - Will Kerns Will.Kerns@Ulteig.com
  - Paul Deutsch Paul.Deutsch@Ulteig.com

Ulteig

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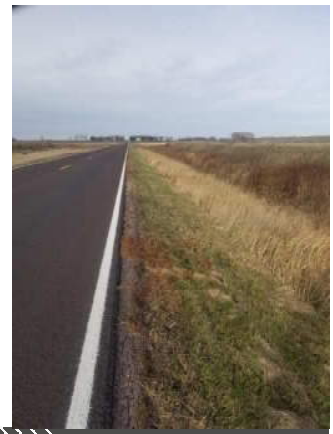


PUBLIC SURVEY RESULTS

The public survey posed 26 questions relating to the existing transportation network in Clay County. A total of 63 surveys were completed and 4 individual comments were submitted outside of the survey. Some of the results and comments from the survey are shown below.

SAFETY FEEDBACK – SPECIFIC CONCERNS

- *"People tend to ignore signage and drive very fast…"*
- *"Distracted driving, speeding, drunk driving, no respect for cyclists"*
- *"Not enough lighting"*
- *…"Inadequate shoulders and road width on county and township gravel roads to support safe agricultural travel"*

FEEDBACK ON ROADS AND BRIDGES – SPECIFIC CONCERNS

- *"Dangerous intersection at 457th and Bluff Rd"*
- *"Some county roads are extremely narrow"*
- *"Extreme washboards on many roads"*
- *"…Closing a road is not a solution to necessary bridge repair or replacement…"*

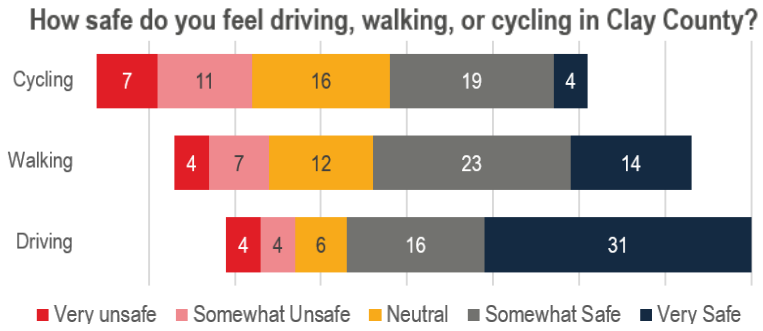
ACTIVE TRANSPORTATION AND RECREATION – SPECIFIC CONCERNS

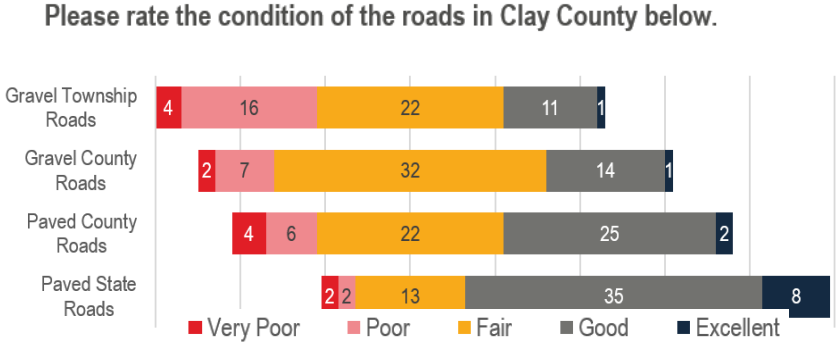
- *"…out of safety concerns we don't walk/bike as much as we would like"*
- *"More bike trails. More traffic control devices to keep the roadways safer to bike and walk"*
- *"Would like bike paths that connect to destinations, like Spirit Mound, Clay Creek, Wakonda, Clay County Park, or anywhwere along the river"*
- *"No shoulder on county roads"*

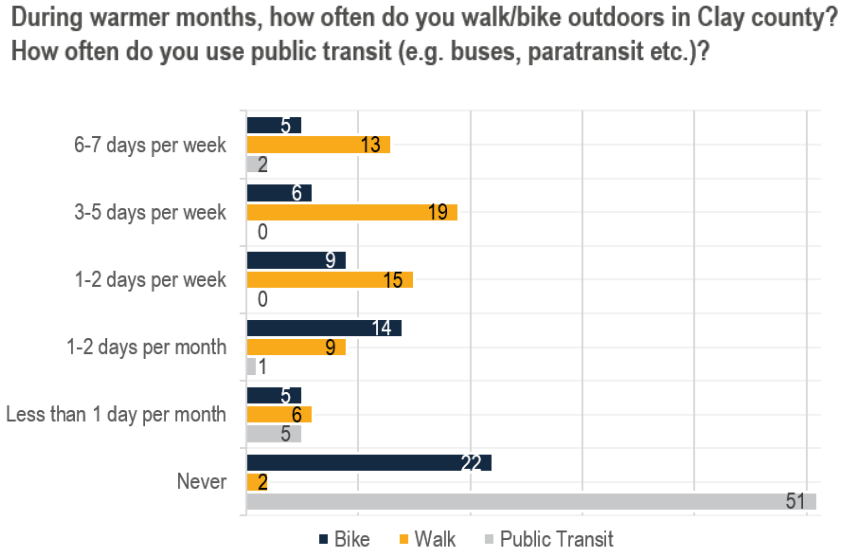
50% of survey respondents says they walk outdoors 3-7 days per week while 50% bike at least 1 day per month, a great baseline number for active living and active transportation in Clay County.

OTHER CONCERNS

- *"Fire, as I live in the country and worry about how fast they could get to my home"*
- *"More public transport for those that cannot drive. There are a number of those in the community that have to wait for public transport, which can take a long time…"*
- *"Pass more floodwater on the Vermillion [River]"*







MAJOR ROADS PLAN

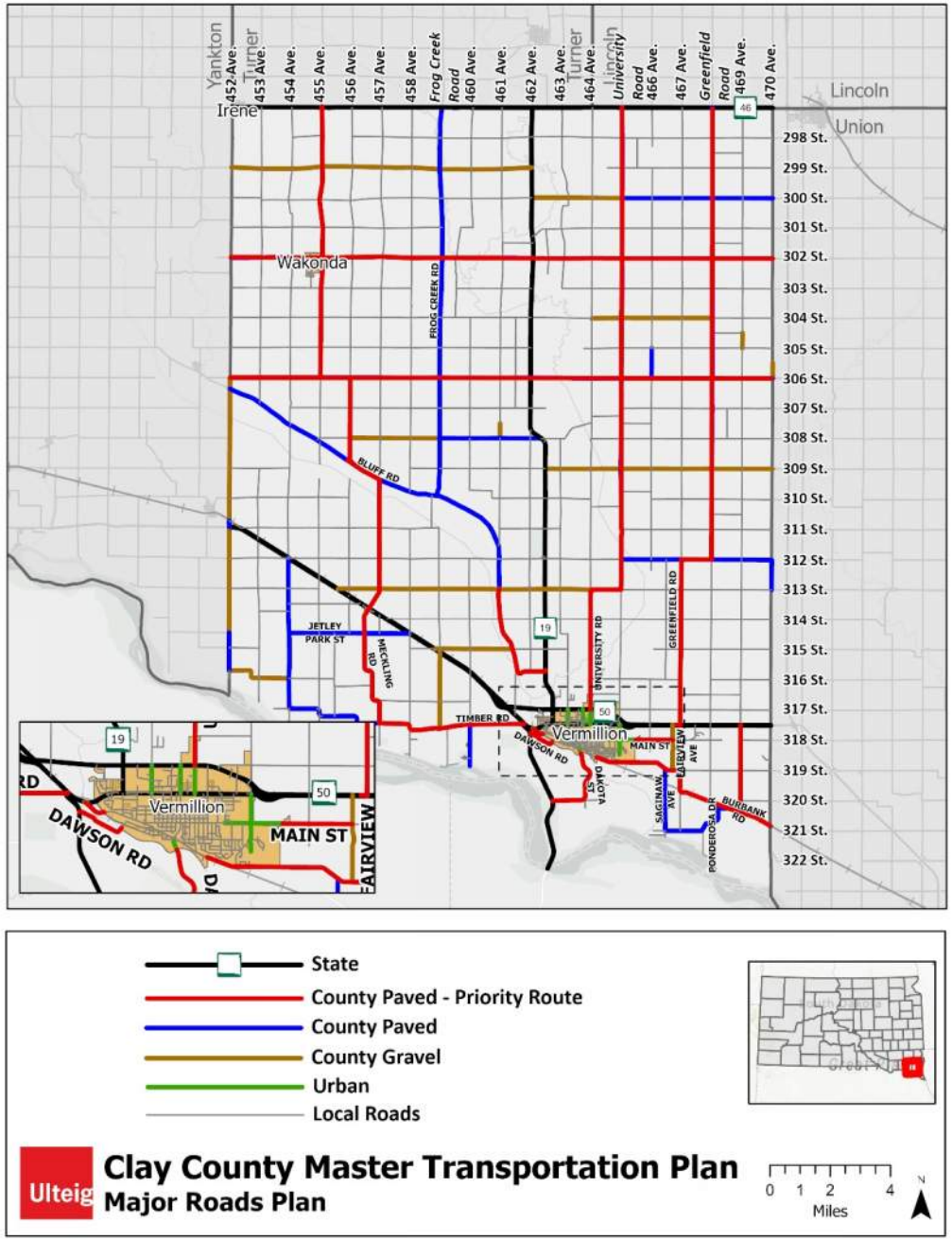
The Clay County Major Roads Plan classifies county roads for project planning.

County Paved – Priority Route

County Paved

County Gravel

Local Roads



BICYCLE & PEDESTRIAN PLAN

Trails Master Plan Phases (Preliminary)
The phased construction of the Clay County Trails Master Plan will benefit Clay County for generations through increased physical activity options, quality of life, tourism, economic development, connectivity, and resiliency.

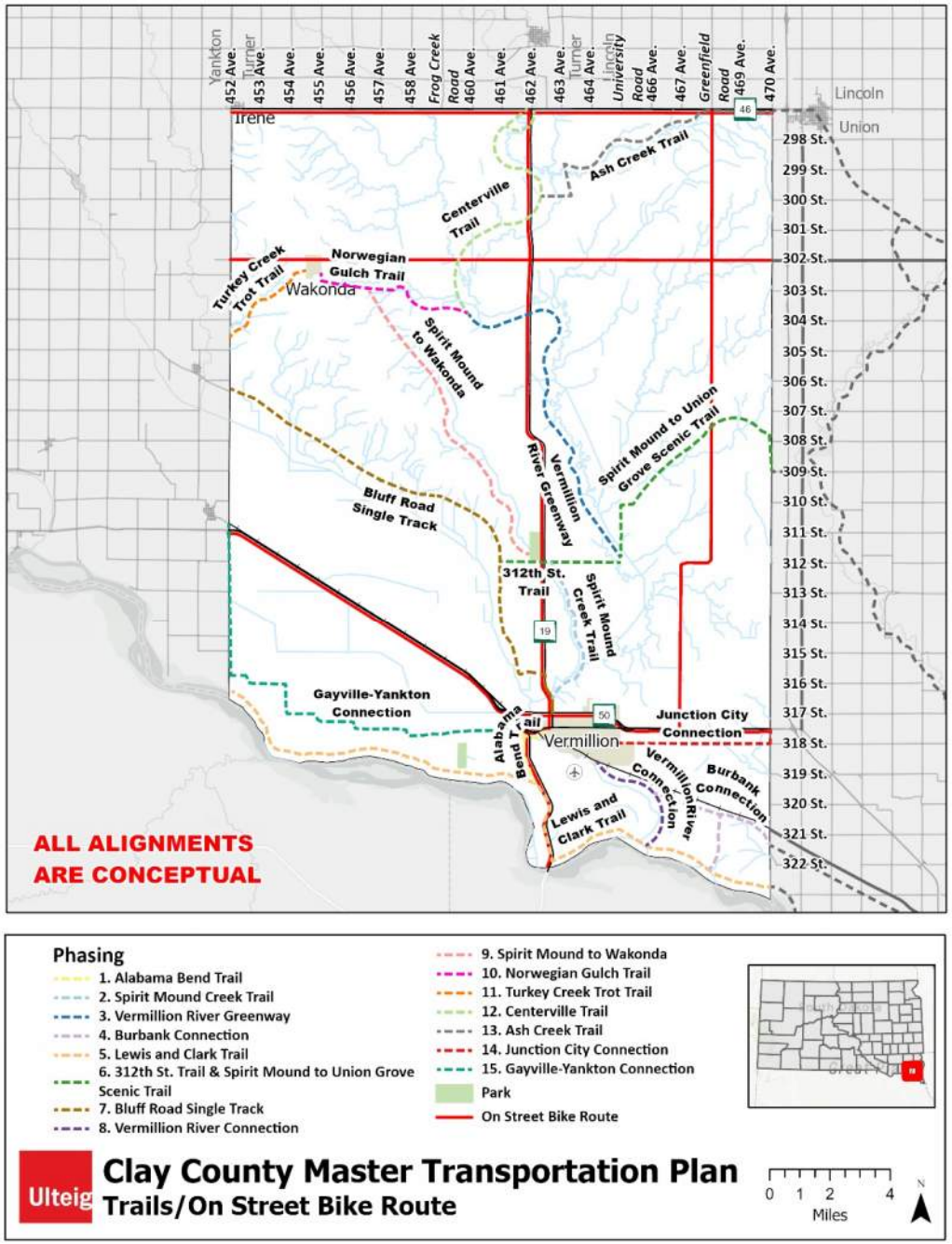
The Clay County Trails Master Plan shown below uses a phased approach and locates trails near existing transportation facilities, towns, riverways, and drainages.

Phase 1 Alabama Bend Trail
Phase 2 Spirit Mound Creek Trail
Phase 3 Vermillion River Connection
Phase 4 Burbank Connection
Phase 5 Lewis and Clark Trail
Phase 6 312th Street Trail, Spirit Mound to Union Grove Scenic Trail
Phase 7 Bluff Road Singletrack
Phase 8 Vermillion River Greenway
Phase 9 Spirit Mound to Wakonda
Phase 10 Norwegian Gulch Trail
Phase 11 Turkey Creek Trot Trail
Phase 12 Centerville Trail
Phase 13 Ash Creek Trail
Phase 14 Junction City Connection
Phase 15 Gayville-Yankton Connection

Trail Surface Type Options

- Loose Surface
- Gravel
- Crusher fines
- Asphalt
- Concrete

On-Road Bicycle and Pedestrian Accommodations in Clay County
The addition of paved shoulders and Bike Route designation is recommended in Clay County to provide enhanced safety for bicyclists and occasional pedestrians.



FLOODING

Future mitigation strategies are explored to help prevent the current impacts of flooding. Focus group meetings about current flood issues were held with county stakeholders to understand the areas most affected and potential solutions.

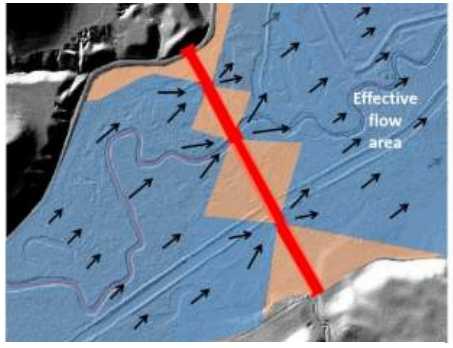
Proposed emergency routes during flood events were identified as well as locations for future road projects to prevent water from overtopping the road or mitigate the damage when overtopping does occur. Comments from the focus group are also shown in the margins of the figure.

FLOOD HAZARD AREAS MAP

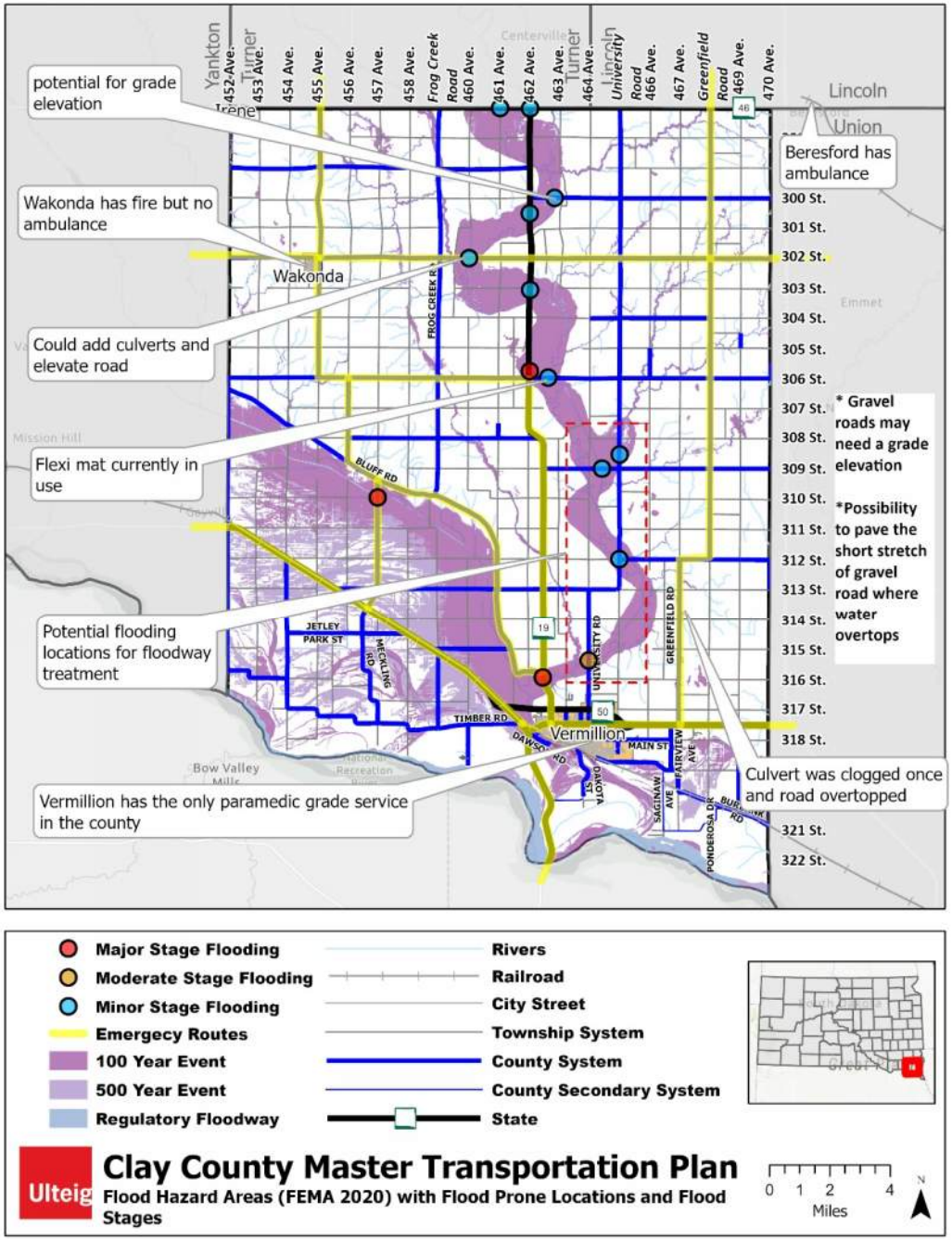
Seasonal Flooding has routinely affected county roads, forcing temporary closure, major repairs, or permanent closure. Clay County is trying to understand flooding patterns. Some locations may be due for an improvement that overcomes flooding issues, but some locations may need to adapt to the reality that flooding will occur.

- Flood Maps
- Grade Raises
- Development of Roadway Floodways
- Geomorphic Design of Floodplain Drainageways
- Other Considerations
  - Minimum Maintenance
  - No Maintenance
  - Road Closure

Floodway with reinforced shoulders in Clay County



Geomorphic Approach to Floodplains



FUTURE TRAFFIC VOLUMES (2045)

Based on future planning daily traffic volumes for the year 2045, traffic congestion is not expected to be an issue for the vast majority of county roads. Almost all county roads are well below planning level capacity.

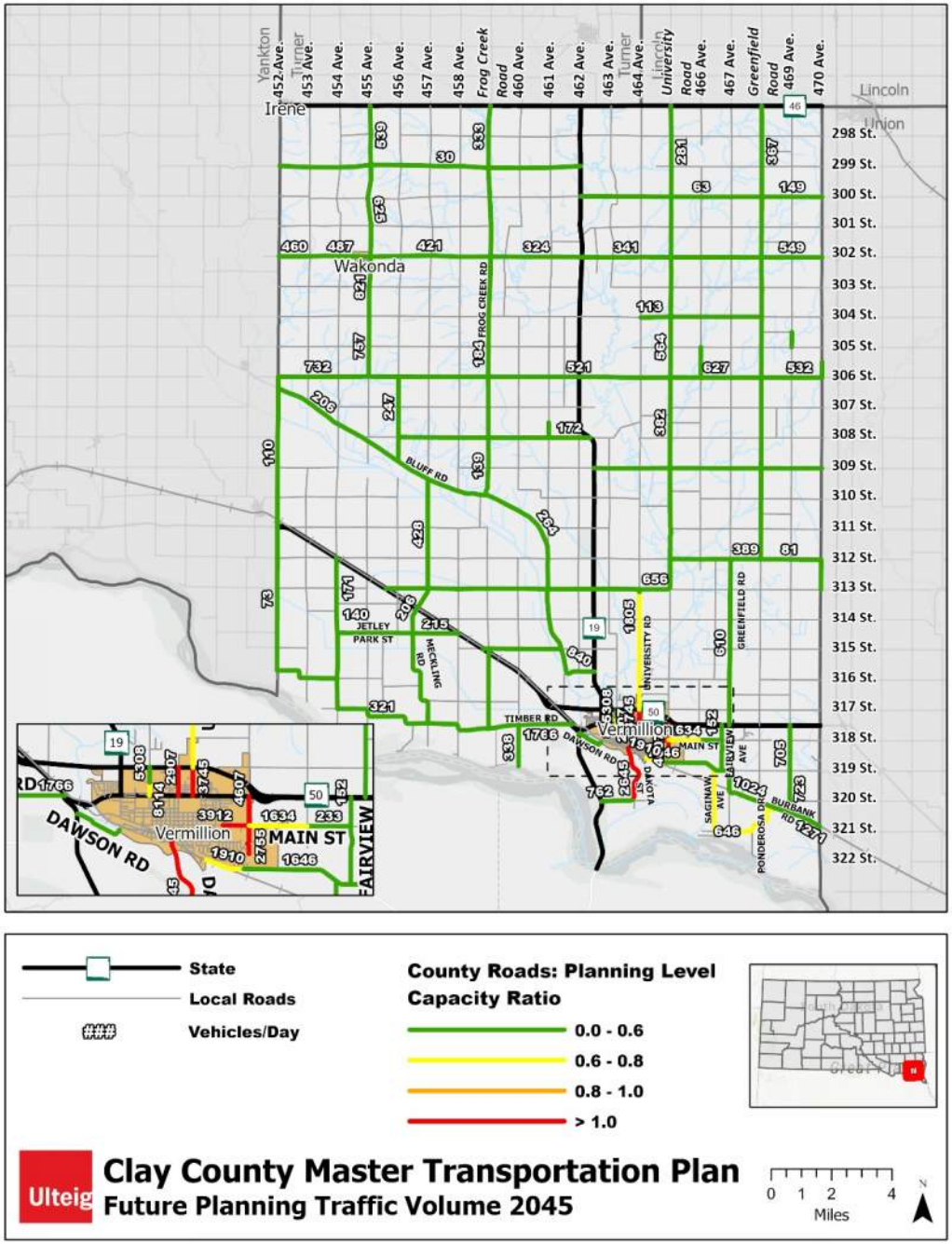
Due to development in the urban and suburban areas of Vermillion, future traffic volumes indicate that some roads under Clay County jurisdiction may approach or exceed capacity by the year 2045. Almost all of these roads can easily be widened to 3 lanes, if necessary, which would accommodate much larger traffic capacities.

As these roads begin to approach planning capacity volumes, additional driving lanes may be necessary, but only after a detailed traffic operations study indicates the need for it.

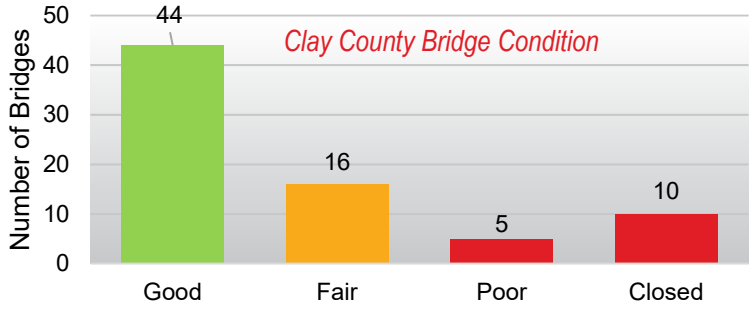
STANDARDS DEVELOPMENT

As part of the MTP, new and updated references for future planning were also developed:

- Major Roads Plan
- Road Design Standards
- Level of Service Standards
- Access Management Guidelines
- Surface Type Change Policy Guidelines
- Jurisdictional Transfer Legal Agreement Template
- Changing Maintenance Designation Guidelines



BRIDGE REPLACEMENT NEEDS



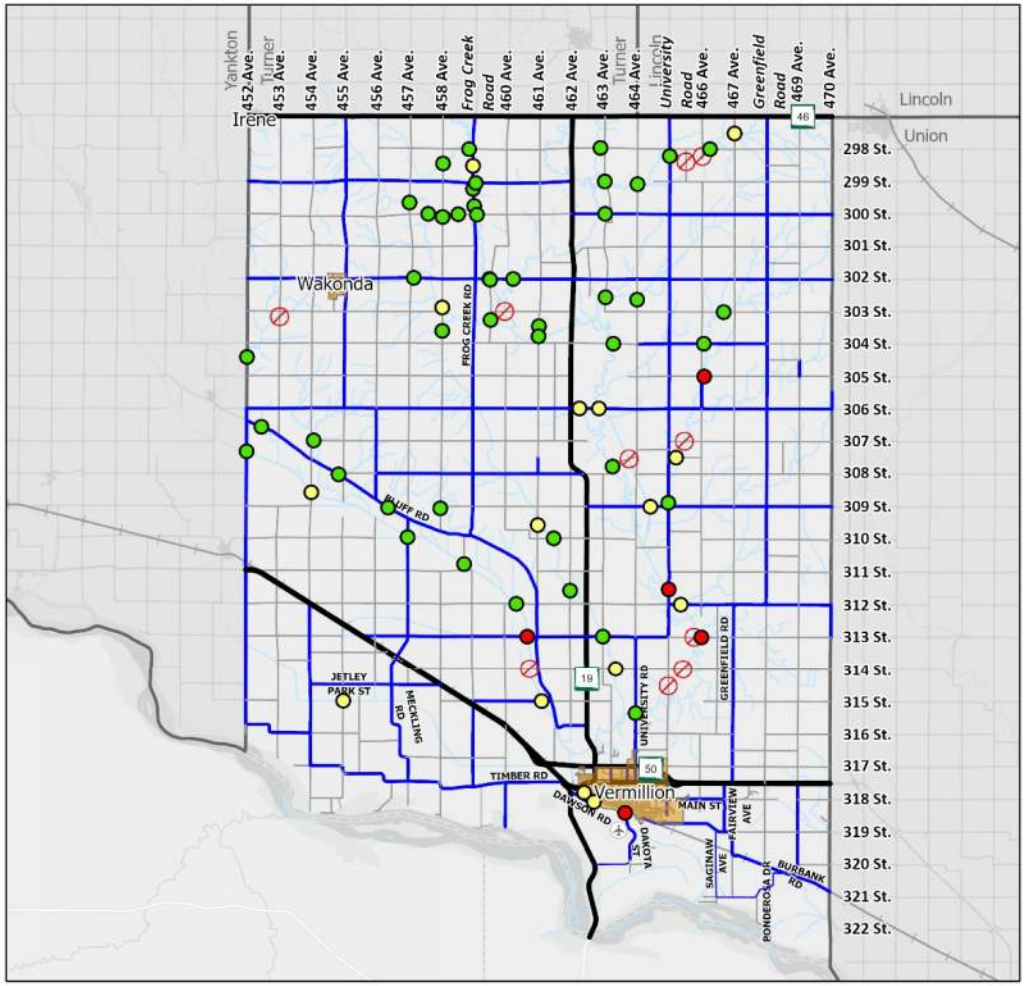
Top 10 Estimated BIG Scores for Bridges in Clay County*					
Structure Number	Location	Bridge Condition	Posted for Load Limits?	ADT (veh/day)	Min. Estimated SDDOT BIG Score**
14-141-080	8.0 S & 14.1 E IRENE SD	Poor	Yes	15	38.6
14-150-006	0.6 S & 15.0 E IRENE	Fair	Yes	25	37.8
14-140-160	7.0 S & 1.1 E OF HUB CITY	Poor	Yes	15	35.5
14-112-090	1.8 W HUB CITY	Fair	Yes	150	29.6
14-030-180	18.0 S & 3.0 E IRENE SD	Fair	Yes	25	21.5
14-130-146	1.2 E & 6.0 N VERMILLION	Poor	No	297	16.6
14-117-214	1.0 S VERMILLION	Poor	No	550	15.9
14-125-120	3.0 S & 0.5 W HUB CITY	Fair	No	97	14.0
14-088-160	0.8 N & 3.8 E MECKLING	Poor	No	125	12.3
14-133-105	10.5 S & 13.3 E IRENE	Fair	No	206	11.8

* Bridges must meet eligibility for rehabilitation or replacement BIG funding (Bridge Improvement Grant).

** Up to 20 additional points can be added ("Bid Review Ready" and 50% cost share).

$1.2 Trillion Infrastructure Investment and Jobs Act (IIJA)

The largest and most comprehensive infrastructure bill in American history passed by Congress on November 6, 2021, will reauthorize surface transportation programs for five years. Of the $2.846 Billion South Dakota is positioned to receive, $225 Million will be for bridge replacement and repairs. These funds will filter down to counties like Clay County and is expected to help in the replacement of bridges.



ENHANCEMENT PROJECTS

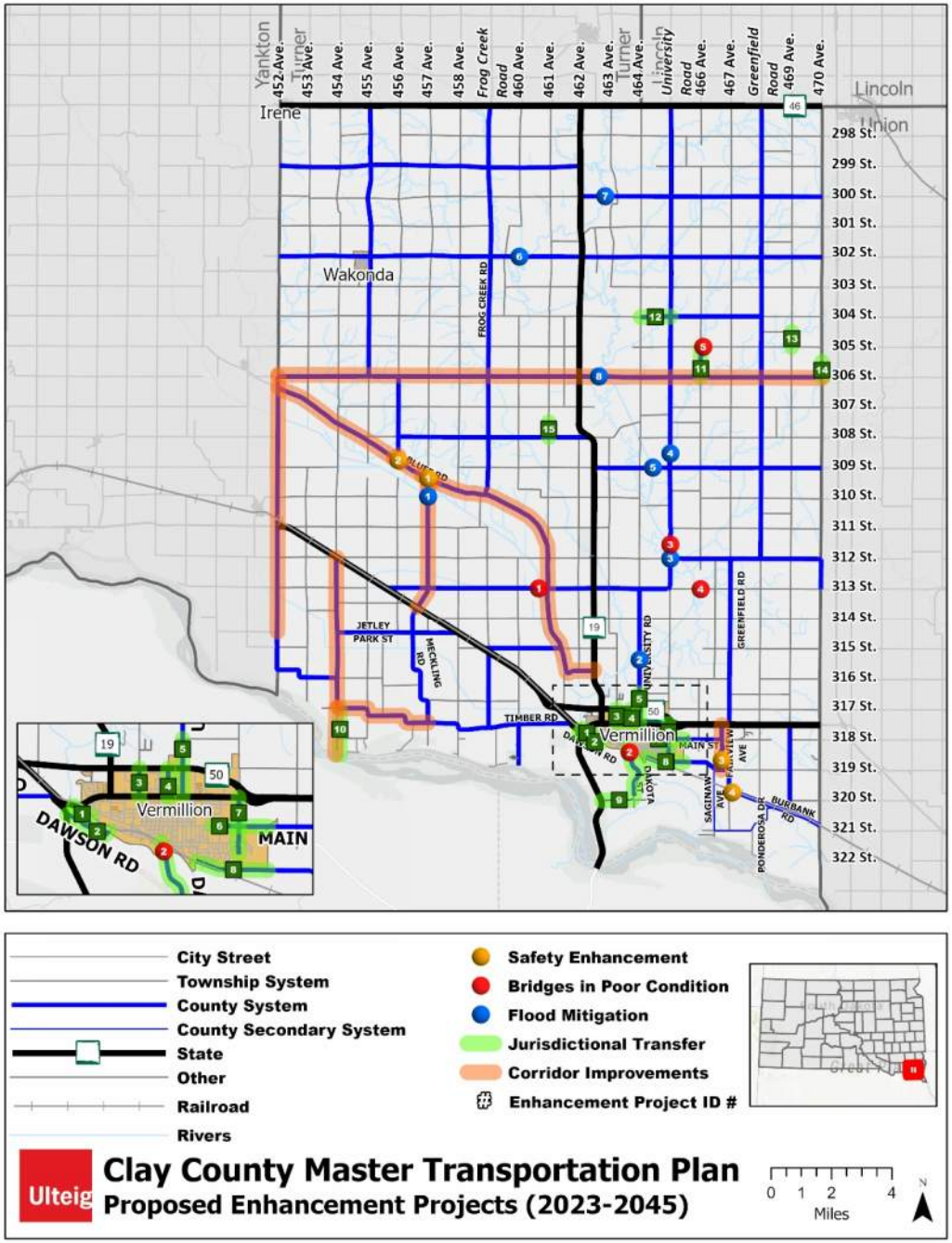
FUTURE PROJECTS PROPOSED TO ADDRESS KNOWN ISSUES

Safety Improvements and other Enhancements were identified during Existing Conditions Review. Future projects with specific solutions that address these issues have been proposed and will be ranked by priority as funding becomes available.

- Corridor Improvements
- Intersection Improvements
- Bridge Improvements
- Drainage Improvements
- Safety Improvements
- Bike and Pedestrian Improvements
- Jurisdictional Transfer

Proposed Enhancement Projects

Enhancement Type	Map ID	Location	Length (mi)	Project Type	Project Description
Safety Enhancements	1	Intersection of Bluff Rd & 457 Ave	-	Safety Enhancement	Reconstruct intersection
	2	Intersection of Bluff Rd & 456 Ave	-	Safety Enhancement	Reconstruct intersection
	3	Fairview Ave Corridor (SD 50 to Burbank Rd)	1.5	Safety Enhancement	Clear trees around curves, stabilize inslopes, and construct guardrail
	4	Burbank Rd	0.3	Safety Enhancement	Wider shoulders, slope flattening, rumble strips, lighting, high friction surface treatment
Corridor Improvements	-	452 Ave Corridor	8.5	Corridor Improvements	Treated gravel, blotter road, or asphalt with 2 ft wide shoulders
	-	454 Ave Corridor	5.0	Corridor Improvements	2 ft wide shoulders
	-	Timber Rd Corridor	3.3	Corridor Improvements	2 ft wide shoulders
	-	457 Ave Corridor	4.4	Corridor Improvements	2-8 ft wide shoulders
	-	306 St Corridor	18.0	Corridor Improvements	2-8 ft wide shoulders
	-	Bluff Rd Corridor	15.9	Corridor Improvements	2-8 ft wide shoulders



GETTING INVOLVED

STAY CONNECTED

Receive updates and announcements by visiting the project website and submitting your email address: ulteig.com/claycountymtp/

INTERACTIVE MAP

The interactive map is a great way to locate any specific comments or concerns using an online GIS application.
On the project website, mark the location on the map with a pin or line, write your comment in the empty comment field, and submit.

LEAVE A COMMENT

If you have additional comments about the project, please fill out the comment form on the project website.

If you have any direct questions or concerns, please contact one of the project managers listed below:

Steve Gramm (Steve.Gramm@state.sd.us) or Will Kerns (William.Kerns@ulteig.com)

SD DEPARTMENT OF TRANSPORTATION

Clay County, South Dakota

U.S. Department of Transportation
Federal Highway Administration

Ulteig

Affidavit of Publication

STATE OF SOUTH DAKOTA
COUNTY OF LINCOLN

I, Michelle Stewart, of the City of Canton, County of Lincoln, State of South Dakota being first duly sworn on oath, deposes and says: Beresford Republic is a weekly legal newspaper of general circulation, printed and published in the City of Beresford, in said County of Lincoln, by Beresford Republic, New Century Press, publishers, and has been such legal newspaper during the times here in after mentioned; that the said newspaper has been in existence as such legal newspaper for more than one year prior to the publication of the notice here unto attached, and has during all of said publication of the notice hereunto attached, and has during all of said time had, and now has, more than 200 bona fide subscribers; that the undersigned, The affiant, is the Office Manager of the said newspaper, in charge of the advertisement department thereof and has personal knowledge of all the facts stated in this affidavit and the advertisement headed:

322897 – Public Meeting 2

once printed copy of hereto attached, is printed and published in the said newspaper for one successive week, one each week and on the same day of the week, on the following dates, to wit:

On Thursday, the 22nd day of September 2022

That $90.00 being the full amount of the fees for publication of the attached notices insures solely for the benefits of the publishers of the said newspaper, that no arrangement or understanding for a division thereof has been made with any other person and that no part thereof has been agreed to be paid to any other person whomsoever.

Michelle C Stewart

Subscribed and sworn to before me this 12th

Day of October 2022

Paul R Harms

Notary Public, Turner County, South Dakota

My Commission Expires: April 24, 2024

PAUL R. HARMS
SEAL NOTARY PUBLIC SOUTH DAKOTA SEAL

Publication Fee $90.00
Notary Fees ..... $
Total $90.00


Accounts as authorized in this
Resolution: except that

SOUTH DAKOTA DEPARTMENT C
AND CLAY COU
NOTICE OF PUBLIC OPEN HOUSE /
FOR CLAY COUNTY MASTER TR
Date: October 5, 2022 • Time
Place: Clay County 4-H Center, 515 Hi
Website: www.ulteig.com/

The South Dakota Department of Transp
with Clay County, will hold an open house st
the date listed above to receive public input
portation Plan. The open house will be inform
sion with the study team. The purpose of the
of the study and receive public comments. A
encouraged to attend and participate in the s
A brief presentation will take place at 5:4
consultant staff will be available after the pre
answer questions. During this time, you will a
written comments.

Those who cannot attend this public me
meeting materials on the project website, w
ing materials presented at the public meet
Comments and questions can also be subn
Notice is further given to individuals with
being held in a physically accessible place.
will require a reasonable accommodation
house should submit a request to the dep
773-3540 or 1-800-877-1113 (Telecommun
Please request the accommodations no la
meeting to ensure accommodations are av
Questions and comments regarding th
Gramm at (605) 773-3281 (steve.gramm
873-5762 (will.kerns@ulteig.com) or Pau
deutsch@ulteig.com).
Comments will be accepted until Octobe
line through the study website, or directly

Notice published twice in New Era for $292.96 and once in

Affidavit of Publication

STATE OF SOUTH DAKOTA
COUNTY OF TURNER

I, Michelle Stewart, of the City of Parker, County of Turner, State of South Dakota being first duly sworn on oath, deposes and says: The New Era is a weekly legal newspaper of general circulation, printed and published in the City of Parker, in said County of Turner, by The New Era, New Century Press, publishers, and has been such legal newspaper during the times here in after mentioned; that the said newspaper has been in existence as such legal newspaper for more than one year prior to the publication of the notice here unto attached, and has during all of said publication of the notice hereunto attached, and has during all of said time had, and now has, more than 200 bona fide subscribers; that the undersigned, the affiant, is the Office Manager of the said newspaper, in charge of the advertisement department thereof and has personal knowledge of all the facts stated in this affidavit and the advertisement headed:

322897 – Public Meeting 2

once printed copy of hereto attached, is printed and published in the said newspaper for two successive weeks, one each week and on the same day of the week, on the following dates, to wit:

On Thursday, the 15th day of September 2022
On Thursday, the 22nd day of September 2022

That $282.96 being the full amount of the fees for publication of the attached notices insure solely for the benefits of the publishers of the said newspaper, that no arrangement or understanding for a division thereof has been made with any other person and that no part thereof has been agreed to be paid to any other person whomsoever.

Michelle C. Stewart

Subscribed and sworn to before me this 12th

Day of October 2022

Paul R. Harms

Notary Public, Turner County, South Dakota

My Commission Expires: April 24, 2024


SOUTH DAKOTA DEPART
AND CL
NOTICE OF PUBLIC OPEN H
FOR CLAY COUNTY MAST
Date: October 5, 2022
Place: Clay County 4-H Center,
Website: www.ulteig
The South Dakota Department of
with Clay County, will hold an open ho
the date listed above to receive public
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sion with the study team. The purpose
of the study and receive public comme
encouraged to attend and participate in
A brief presentation will take place a
consultant staff will be available after the
answer questions. During this time, you
written comments.
Those who cannot attend this public
meeting materials on the project website
ing materials presented at the public me
Comments and questions can also be sul
Notice is further given to individuals wi
being held in a physically accessible place
will require a reasonable accommodatio
house should submit a request to the de
773-3540 or 1-800-877-1113 (Telecommur
Please request the accommodations no la
meeting to ensure accommodations are av
Questions and comments regarding th
Gramm at (605) 773-3281 (steve.gramm@
873-5762 (will.kerns@ulteig.com) or Paul
deutsch@ulteig.com).
Comments will be accepted until October
line through the study website, or directly to
Notice published twice in New Era for $292.96 and once in the
that the South Dakota

Publication Fee $282.96
Notary Fees ..... $
Total $282.96

PAUL R. HARMS
SEAL NOTARY PUBLIC SEAL
SOUTH DAKOTA

AFFIDAVIT OF PUBLICATION

YANKTON DAILY PRESS AND DAKOTAN

ULTEIG
5575 DTC PARKWAY SUITE 200
GREENWOOD VILLAGE CO 80111

STATE OF SOUTH DAKOTA
COUNTY OF YANKTON

KELLY HERTZ, BEING FIRST DULY SWORN ON OATH DEPOSES AND SAYS THAT (S)HE IS THE MANAGING EDITOR OF YANKTON MEDIA INC, A CORPORATION, THE PRINTER AND THE PUBLISHER OF THE YANKTON DAILY PRESS AND DAKOTAN, A LEGAL DAILY NEWSPAPER PUBLISHED AND CIRCULATED IN THE CITY OF YANKTON, SAID COUNTY AND STATE, AND ONE OF THE OFFICIAL NEWSPAPERS OF THE SAID COUNTY OF FACTS STATED IN THIS AFFIDAVIT; THAT THE ANNEXED PUBLIC NOTICE FOR CLAY CO

TAKEN FROM THE PAPER, IN WHICH IT WAS LAST PUBLISHED IN THE NEWSPAPER ON THE 23rd DAY OF September, 2022
THAT THE FULL AMOUNT OF THE FEE CHARGED FOR THE PUBLICATION OF SAID NOTICE TO WIT $587.20 ENSURES TO THE BENEFITS OF THE PUBLISHER OF SAID NEWSPAPER AND THAT NO AGREEMENT AND UNDERSTANDING FOR THE DIVISION THEREOF HAS BEEN MADE WITH ANY OTHER PERSON, AND THAT NO PART THEREOF HAS BEEN AGREED TO BE PAID TO ANY PERSON WHOMSOEVER.

PUBLISHED ON: 09/23/2022

FILED ON: 10/13/2022

SUBSCRIBED AND SWORN TO BEFORE ME THIS 13th DAY OF October, 2022

NOTARY PUBLIC, SOUTH DAKOTA
MY COMMISSION EXPIRES 07/04/2026

AFFIDAVIT OF PUBLICATION

PLAIN TALK

ULTEIG
5575 DTC PARKWAY SUITE 200
GREENWOOD VILLAGE CO 80111

STATE OF SOUTH DAKOTA
COUNTY OF CLAY

MICHELE SCHIEVELBEIN, BEING FIRST DULY SWORN ON OATH DEPOSES AND SAYS THAT (S)HE IS THE ADVERTISING DIRECTOR OF YANKTON MEDIA INC, A CORPORATION, THE PRINTER AND THE PUBLISHER OF THE PLAIN TALK, A LEGAL WEEKLY NEWSPAPER PUBLISHED AND CIRCULATED IN THE CITY OF VERMILLION, SAID COUNTY AND STATE, AND ONE OF THE OFFICIAL NEWSPAPERS OF THE SAID COUNTY OF FACTS STATED IN THIS AFFIDAVIT; THAT THE ANNEXED
PUBLIC NOTICE - PUBLIC ME

TAKEN FROM THE PAPER, IN WHICH IT WAS LAST PUBLISHED IN THE NEWSPAPER ON THE 23rd DAY OF September, 2022
THAT THE FULL AMOUNT OF THE FEE CHARGED FOR THE PUBLICATION OF SAID NOTICE TO WIT $544.00 ENSURES TO THE BENEFITS OF THE PUBLISHER OF SAID NEWSPAPER AND THAT NO AGREEMENT AND UNDERSTANDING FOR THE DIVISION THEREOF HAS BEEN MADE WITH ANY OTHER PERSON, AND THAT NO PART THEREOF HAS BEEN AGREED TO BE PAID TO ANY PERSON WHOMSOEVER.

PUBLISHED ON: 09/16/2022 09/23/2022

FILED ON: 11/09/2022

SUBSCRIBED AND SWORN TO BEFORE ME THIS 9th DAY OF November, 2022

NOTARY PUBLIC, SOUTH DAKOTA
MY COMMISSION EXPIRES 07/04/2026

CASSANDRA BROCKMOLLER NOTARY PUBLIC STATE OF SOUTH DAKOTA

APPENDIX D
COUNTY COMMISSION MEETING SUMMARY

COUNTY COMMISSION MEETING SUMMARY

Clay County Master Transportation Plan

The findings and recommendations of the Clay County Master Transportation Plan were presented to the Clay County Commission on December 6, 2022, with a request to the County to "accept" the final plan upon completion.

Attendance

Union County Commissioners – 5 (all in person)
(Travis Mockler, Phyllis Packard, Elizabeth Smith, Michael Manning, Richard Hammond)

Other – 10 (2 in person, 8 via *Zoom*)
(Carri Crum, Rod Polley, Alexis Tracy, Andy Howe, Drew Gunderson, Ina Peterson, Layne Stewart, Rhonda Howe, Steven Waller, Caitlyn Dommer)

Summary of Materials Provided

Print outs of the presentation as well as major maps and tables were provided to the commissioners. A presentation was made using PowerPoint.

Comments and Questions

During the meeting, those present commented and asked questions about the study and materials presented:

- The Trails Master Plan does not seem feasible if you have to negotiate with land owners. They won't want trails on their property. I don't want people around my property, and we already get complaints about gates being left open during short hunting seasons. Are these trails routes on land owner property? How were they chosen?
    - *Response: There are trails shown on land owner property, and the alignments were chosen from a very high level based on general terrain, location of destinations, and input from stakeholders and public citizens. However, all alignments shown are conceptual, and there is no commitment to these. We believe some of the concepts shown are feasible, as we have heard demand for trails in some of these locations, and you want to start small with successful and low cost improvements. This is a great conversation starter and there is great benefit to have something on paper to point to, including the ability to acquire funding. It is our belief that the benefits of a trail network outweigh the negatives. The idea can be championed by individuals and groups to build momentum that helps convince others it is very advantageous, and that is essential, or the idea could be perceived in a negative way. Some will see the benefit to having trails near their homes, and not all will be against the idea. A feasibility study would be the next step, and even then, you are not committing to any of the alignments.*
- The public has provided openness and positive responses to the idea of the county-wide trails plan, and it was a well discussed topic at the public meetings. There are people out there that may want trails near their

houses to increase property value. Many of the trails drawn up here were direct comments from the public that shared ideas for trail locations.
    - *Response: That is correct.*
- Please help make it clear that the trails master plan is conceptual if it is not already. We don't want people to think the County is necessarily coming for their property.
    - *Response: Thank you for your comment. The map shows a conceptual statement in red letters.*
- Is the bridge on Dakota St, one mile south of Vermillion (14-117-214) really in Poor Condition? It was improved a few years ago, and we don't think it should be in Poor Condition anymore.
    - *Response: The bridge data shown all come from the same database and is a snapshot in time taken during the existing conditions review when we first started the project about a year ago. If the database has not been updated or the bridge has not been inspected since the improvement, then what is shown may be out of date. It is hard to chase down every bridge condition that appears to be out of date, so we generally just leave it as is. However, we did remove some bridges from the list that are no longer on the County's bridge network if that was necessary. We will look at that bridge specifically to find the most recent bridge inspection to make sure we are showing the correct condition for that bridge.*
- Why did we recently become eligible for the SDDOT Bridge Improvement Grants?
    - *Response: One of the major criteria for eligibility is to have a 5-year road and bridge improvement plan on file with the SDDOT. Clay County provided that formally within the last couple of months for the first time. This is a great new tool for Clay County to take advantage of to assist with bridge improvements.*
- Looking at the Major Roads Plan, there are some roads out in space between county roads or within City of Vermillion that aren't County Roads. This appears to be incorrect. Isn't it important to make sure it is correct, and couldn't that impact funding? How can we fix that, and can you change it on your map if we know it is wrong?
    - *Response: These roads are County Roads according to the SDDOT's database and the only formal resource we had to create the maps. Only the SDDOT can change that and there is a process. There needs to be something formal in the jurisdictional records and sent to the SDDOT to update the database, and that will probably take longer than the time remaining to finish the final version of this report. As part of this study, we provide a Memorandum of Understanding which is a resource that will assist with jurisdictional transfer record keeping. It is possible there is a record of transfer already, but maybe not. We recommend formalizing it and updating with the SDDOT, and all roads that could be candidates for transfer are listed in the report; we call them candidates for jurisdictional transfer in the enhancement plan section of the study. We are not sure how a map in this report with slight discrepancies in road ownership would necessarily impact future funding applications, but we won't rule that scenario out. It is in the best interest of the County to iron out any discrepancies with the SDDOT, and this report is a good starting point to identify where those discrepancies may be.*
- You didn't rule out the chance that it could impact funding. The County should make sure the records are accurate, maybe you could note which roads are "in question" or there is a "discrepancy of records" or change the color somehow. We don't want people to look at these maps and get misinformed about which roads are actually county-owned roads.
    - *Response: We do mention the issue and do recommend doing just that, but perhaps we could make it more clear on the maps themselves. The SDDOT database is the only record we are*

aware of, so it is hard to say with confidence anything contrary to that. We will work with Rod Polley and find out which roads he is sure are incorrect, or we could generically mention a disclaimer on some of the maps that the database from which the map was developed may not be 100% correct with regards to the current understanding of whose road is whose.

- Some of these routes shown for jurisdictional transfer may not make sense. We believe some of these are not even county routes to be transferred away.
    - *Response: Those routes are shown as candidates for jurisdictional transfer. If they have not been formally transferred, then it makes sense to show them in the report and start the process. However, if you don't want them shown on the list because you believe the SDDOT database is simply wrong and will be easily updated, we can remove any that you believe should not be on the list.*
- On behalf of the Study Advisory Team, this study presents useful information and products far beyond what was shared today. I believe a bicycle and pedestrian aspect of the study was one of the required elements. Although the Trails Master Plan is a very interesting and useful aspect of the study, it is only one piece of the overall study, and it isn't meant to be divisive in anyway or solely fixated on the part of bicycles and pedestrians. There are many benefits the County can take from this study. Another thing that was only briefly mentioned today is the analysis conducted at flooding locations. At earlier meetings, Ulteig presented ideas of how to help mitigate flooding issues encountered by the County including locations that could be improved with floodway treatments. Also, the plan points out specific locations where safety improvements could be made at problem intersections or corridors. This study also helped us find where the State's records were out of date, which could affect us funding-wise and planning-wise.
    - *Response: That is correct.*
- It does not appear all county bridge structures are shown, and some of these are on township roads.
    - *Response: All county bridge structures owned and maintained by Clay County are shown. If there are structures longer than 20 feet in length on township roads, then it is a structure owned and maintained by the County.*

APPENDIX E
JURISDICTIONAL TRANSFER TEMPLATE – MEMORANDUM OF UNDERSTANDING

MEMORANDUM OF UNDERSTANDING
BETWEEN CLAY COUNTY
AND [City/Township name here]
for the
Jurisdictional Transfer of [Road Name]

1) **Parties.** This Memorandum of Understanding (hereinafter "MOU") for the jurisdictional transfer of [Road Name] is made and entered into by and between Clay County (hereinafter "County") [insert county address] and [City/Township name here] (hereinafter "City/Township"), [insert City/Township address] which may be referred to individually as "party" or collectively as "parties".

2) **Term.** The provisions in this MOU will commence upon execution of all necessary signature and shall remain in effect in perpetuity. The MOU may be terminated with the mutual written agreement of the County and the [City/Township].

3) **Purpose.** Establishing clear boundaries of ownership and maintenance are important when there is a jurisdictional transfer of [Road Name]. This MOU pertains to the maintenance and ownership of [Road Name] within the jurisdiction of the [County] and transferring that ownership and maintenance to the [City/Township]. The jurisdictional transfer of [Road Name] is necessary because [insert reasoning behind jurisdictional transfer].

4) **Limits of Jurisdictional Transfer.** This Agreement expressly includes x,xxx feet of [Road Name] between [point on road] and [point on road] and any all related property, responsibilities, obligations which were previously considered to be the responsibilities and obligations of the [County].

5) **Financial Requirements. [This section is used if financial compensation is part of the jurisdictional transfer]** The [City/Township] agrees to accept the following payment schedule: [describe any financial payments agreed by the two parties]. If for any reason financial requirements are not met within [x] years, maintenance obligations and responsibilities shall revert back to the [County] immediately.

6) **Required Documentation for Jurisdictional Transfer.** The parties agree that the following requirements were satisfied and that the transfer of ownership of [Road Name] is authorized:
    a. A memo stating the reasons for the requested change.
    b. A survey plan set, signed by a registered Professional Land Surveyor, that shows the limits of the jurisdictional transfer. The point of beginning of the survey shall be the nearest section corner. Included in this MOU as Exhibit 1.

c. A public notice sent to all directly affected landowners, responses from the landowners, and any resolutions that were required from the public notice period. Included in this MOU as Exhibit 2.

d. Notification to franchise utilities affected, contact information for each franchise utility, and any as-built drawings for existing infrastructure. Included in this MOU as Exhibit 3.

e. The as-builts of [Road Name], if available. Included in this MOU as Exhibit 4.

f. [Modify this section to only include relevant utilities] Storm, sanitary, and water utilities within and along [Road Name] that are being transferred with this MOU shall have as-builts drawings, if available (Included in this MOU as Exhibit 5). The general location and size of these public utilities explained below:

    i. [Insert general explanation of any utilities that are being fully transferred as part of the MOU, make sure to separate different utilities into a new bullet point]

g. [Modify this section to only include relevant utilities] Storm, sanitary, and water utilities within and along [Road Name] that are NOT being transferred shall require an easement agreement to ensure proper maintenance (Included in this MOU as Exhibit 6). The general location and size of these public utilities is explained below:

    i. [Insert general explanation of any utilities that will require an easement as part of the MOU, make sure to separate different utilities into a new bullet point]

h. Other pertinent information to the jurisdictional transfer of [Road Name] needed for this MOU is listed below:

    i. [Insert any other information required not already covered by this MOU]

7) **South Dakota Department of Transportation (SDDOT) Transmittal.** All information included as part of this agreement shall be submitted to the SDDOT in the form of a signed resolution. Contact SDDOT Office of Project Development for guidance on current laws and policies. Advanced notice may be required.

8) **Amendments.** Either party may request changes in this MOU. Any changes, modifications, revisions, or amendments to this MOU which are mutually agreed upon shall be incorporated by written instrument, executed, and signed by all parties to this MOU.

9) **Assignment.** Without prior written consent of the other party, neither party may assign this MOU. This MOU shall inure to the benefit of, and be binding upon, permitted successors and assigns of the parties.

10) **Entirety of MOU.** This MOU represents the entire and integrated MOU between the parties and supersedes all prior negotiations, representations, and MOUs, whether written or oral.

11) **Sovereign Immunity.** The County and the [City/Township] do not waive their sovereign or governmental immunity by entering into this MOU, and fully retains all immunities and defenses provided by law with respect to any action based on or occurring as a result of this MOU.

12) **Indemnification.** Neither party shall indemnify, defend, or hold harmless the other for any cause of action, or claim or demand arising out of this MOU. Each party shall be responsible for their own negligent actions or omissions.

13) **Interpretation.** The construction, interpretation, and enforcement of this MOU shall be governed by the laws of the State of South Dakota. The courts of the State of South Dakota shall have jurisdiction over any arising out of this MOU and over the parties and the venue shall be the First Judicial Circuit Court, Clay County, South Dakota.

14) **Third Part Beneficiary Rights.** The parties do not intend to create in any other individual or entity the status of third part beneficiary, and this MOU shall not be construed so as to create such status. The rights, duties, and obligations contained in this MOU shall operate only between the parties to this MOU and shall inure solely to the benefit of the parties to this MOU. The provisions of this MOU are intended only to assist the parties in determining and performing their obligations under this MOU. The parties to this MOU intend and expressly agree that only parties signatory to this MOU shall have any legal or equitable right to seek to enforce this MOU, to seek any remedy arising out of a party's performance or failure to perform any term or condition of this MOU, or to bring an action for the breach of this MOU.

15) **Legal Authority.** Each party to this MOU warrants that it possesses the legal authority to enter into this MOU and that it has taken all actions required by its regulations, procedures, bylaws, and/or applicable law to exercise that authority and to lawfully authorize its undersigned signatory to execute this MOU and to bind it to its terms. The person(s) executing this MOU on behalf of a party warrant(s) that such person(s) have full authorization to execute this MOU.

16) **Signatures.** In witness whereof, the parties to this MOU through their duly authorized representatives have executed this MOU on the days and dates set out below, and certify that they have read, understood, and agreed to the terms and conditions of this MOU as set forth herein.

APPROVED BY:

Clay County

_____ _____
Signature Date

_____
Name

_____
Title

[City/Township Name]

_____ _____
Signature Date

_____
Name

_____
Title