CHAPTER 5
TRANSPORTATION

GUIDING PRINCIPLES FOR TRANSPORTATION

Network

Virtually every resident of Clay County is impacted by transportation. The County's transportation network reaches every corner of its boundary and helps connect people to their homes, jobs, natural and cultural resources, recreation, and other important places. Clay County's transportation network is an essential service and should be planned accordingly to maintain and promote the health, safety, and welfare of not only County residents, but other local communities. The transportation network should work harmoniously to provide for safe, efficient, and reliable multi-modal travel of people, goods, and services across Clay County.

Safety

Safety is one of the core foundations of Clay County's transportation system. As an inherent component of services the County provides, safety should have a very strong focus when planning for future transportation infrastructure, or analyzing current transportation infrastructure performance. Residents of Clay County should be able to go about their daily lives in a safe manner and the transportation system is essential in providing safe mobility, wherever and however people choose to travel along County roadways.

Character

The transportation system should compliment and may be challenged by Clay County's rural character. The rural character and charm of the County is cherished by residents therefore, the management of the transportation system can help preserve and sustain that character in the long-term. The transportation system and rural character of Clay County may be challenged by urban development and the juxtaposition to rural areas, and the transition in between those areas. Opportunities and challenges are growing in the transitional areas in between urban and rural areas of the County, including small towns within Clay County. The County's reputable character can be preserved through thoughtful consideration of transportation system management and operational tactics that preserve this character.

Multi-modal

Multiple modes of transportation, referred to as multi-modal transportation, is another essential element of Clay County's transportation system. People expect to get to where they need, however they want to get there, whether by car, truck, motorcycle, bus, tractor, semi-truck, horse, foot, bicycle, or other means across Clay County. This is not to say that every roadway in the County needs to or is expected to accommodate every single mode of travel as most roadways need to prioritize certain modes of travel. However, multi-modal consideration should be given to every aspect of the transportation system to look for ways to enhance mobility, safety, and reliability for all potential users of the roadway network.

INTRODUCTION

The Transportation Chapter of the *Clay County Comprehensive and Transportation Plan* should be used by the County, cognizant partners, and residents as a guide to maintain and improve Clay County's transportation system through 2045 and to support not only land use goals and objectives but other goals and objectives as found in different chapters throughout the plan. Also referred to as the Clay County Transportation Plan, the Transportation Chapter exists in the framework of regional, state, and national transportation planning policies and guidelines. The Transportation Plan is part of Clay County's Comprehensive Plan update, and responds to guidance and direction provided by the Fargo-Moorhead Metropolitan Council of Governments to all jurisdictions within the Fargo-Moorhead Metropolitan Planning Area (MPA) through the policy direction of the 2045 Metropolitan Transportation Plan (MTP), *Metro Grow*.

The Transportation Plan provides the vision for the future transportation system in Clay County, supports comprehensive plan goals and objectives, and documents the County's transportation policies and strategies. The Plan identifies major transportation system investment needs and guides prioritization of those needs.

The purpose of the transportation system in Clay County is to move people and goods in the safest and most efficient manner possible across the County. The Clay County Board of Comissioners understands the transportation system is a critical element of the quality of life for citizens.

Transportation systems, both highway and transit, must safely, efficiently, and effectively allow citizens to travel where they need to throughout their daily personal lives. Clay County's transportation system must further provide for the efficient movement of goods to markets to support economic vitality. Multiple transportation options should work in coordination to increase the efficiency and safety of the entire system. Additionally, transportation decisions should carefully consider and reflect environmental and community concerns.

EXISTING CONDITIONS

To accurately identify transportation needs and prepare a plan to meet those needs, Clay County studied the existing conditions of transportation resources and travel behavior of current users. This analysis includes examination of traffic volumes, pavement, functional classification, safety, bridges, railroads, and airports.

Traffic Volumes

Average daily traffic volumes show how many vehicles travel on a road in an average day. Outside of the urban and small town areas of Clay County, traffic volumes are quite low. The highest volumes are along roadways with good connectivity to major economic centers. Metro COG collected traffic volume data for Clay County in 2015 and the Minnesota Department of Transportation (MnDOT) collected traffic volume data in 2017 and 2019. Metro COG is in the process of collecting traffic counts in 2021, with some locations in Clay County already being counted.

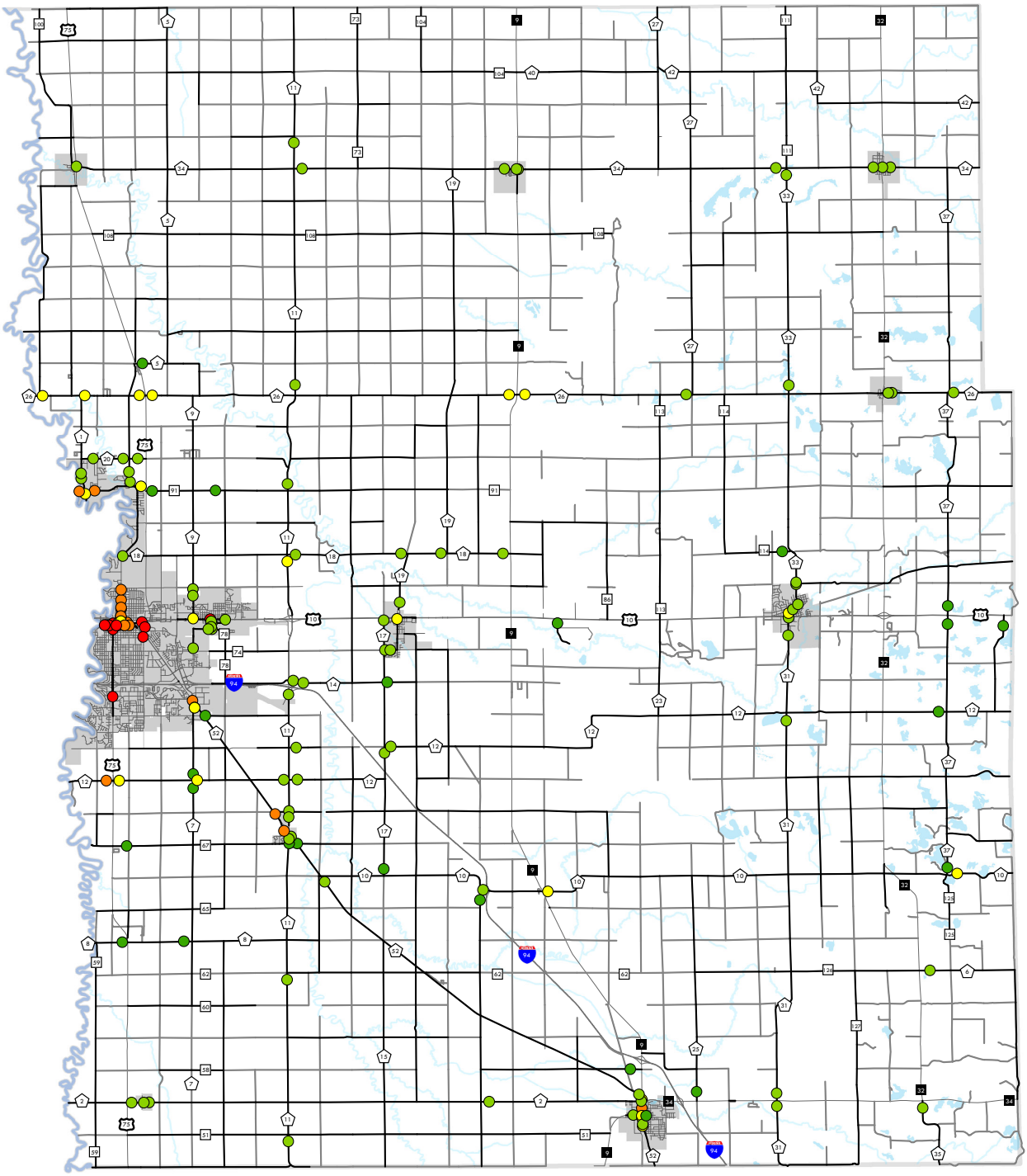

Figure 5.01- Traffic Volumes

Source: Metro COG (2015) & MnDOT (2019)

Average Annualized Daily Traffic (AADT)
- 0-250
- 251-1500
- 1501-4000
- 4001-10000
- 10001-19000

- County Roadway
- Township Roadway
- Local or State Roadway
- 86 CR
- 34 MN Hwy
- 52 CSAH
- 75 US Hwy
- 94 Interstate

N

CLAY COUNTY COMPREHENSIVE PLAN

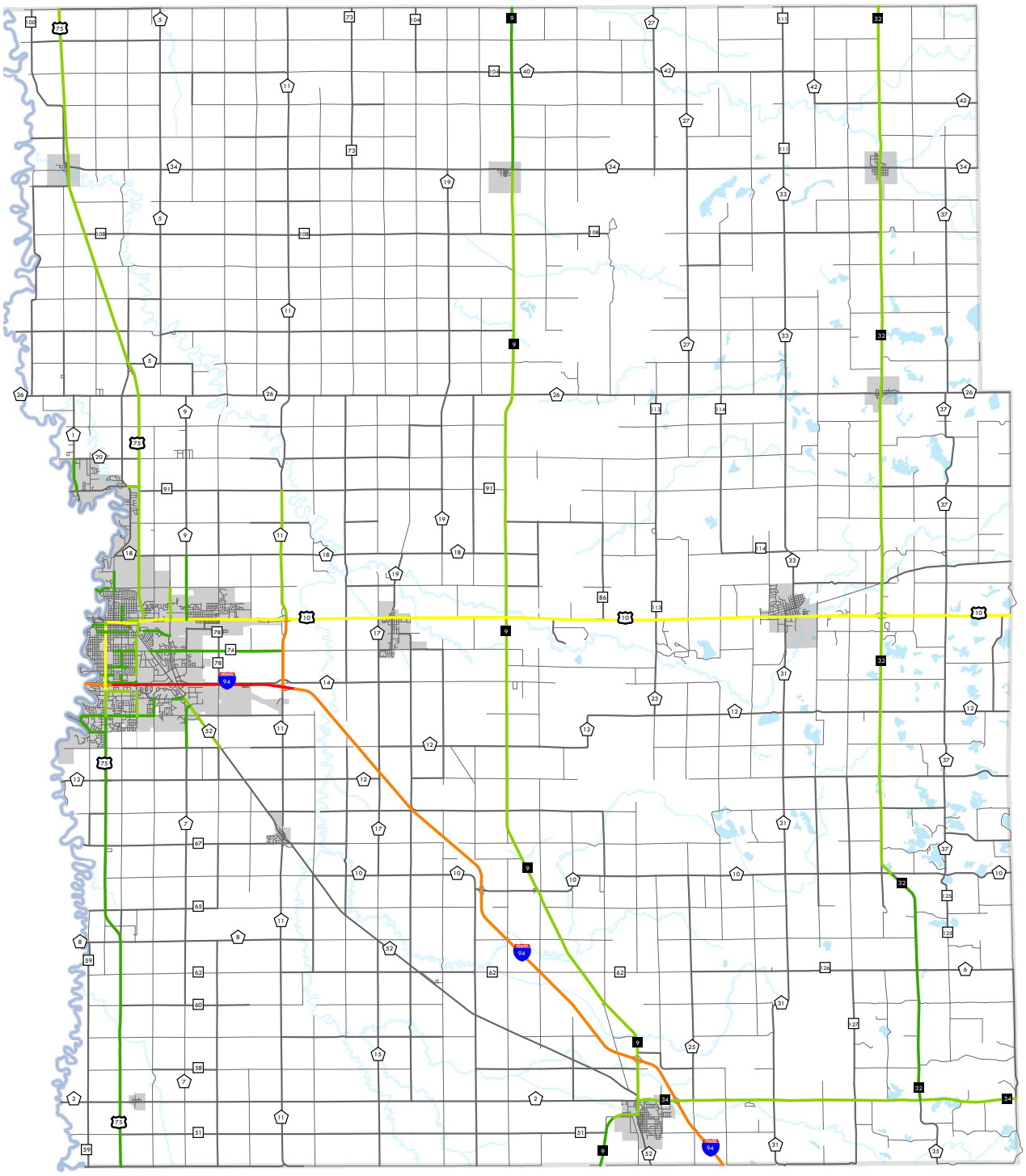

Figure 5.02 - Truck Traffic

Source: MnDOT (2020)

Heavy Commercial Average Annualized Daily Traffic (HCAADT)

- 0-200
- 201-600
- 601-1300
- 1301-5000
- 5001-8000
- County Roadway
- Township Roadway
- Local or State Roadway
- 75 US Hwy
- 86 CR
- 52 CSAH
- 34 MN Hwy
- 94 Interstate

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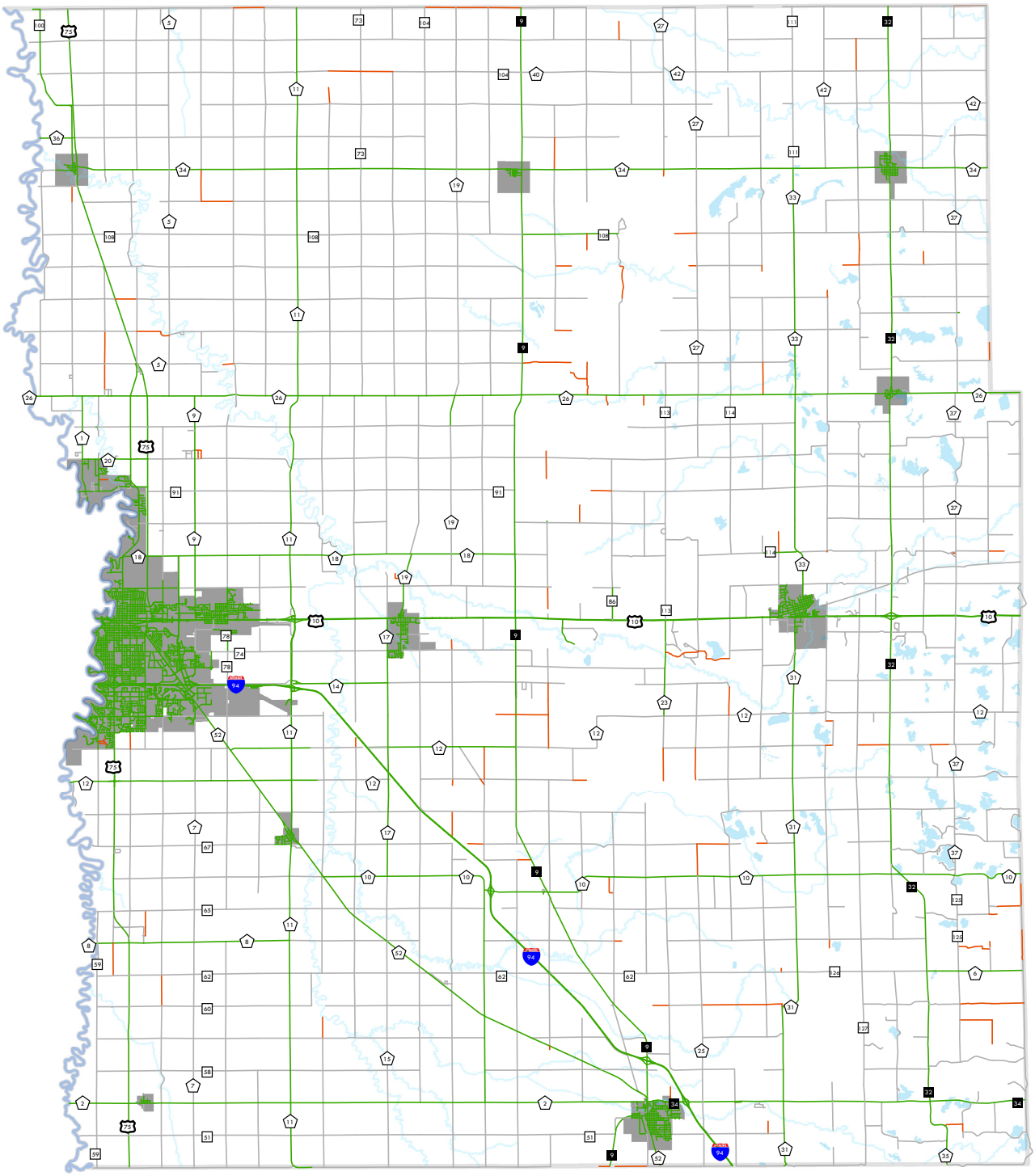
CLAY COUNTY COMPREHENSIVE PLAN

The most recent traffic counts included truck counts. Truck traffic ranges from one percent of total traffic to 10 percent on Clay County Roadways. Despite these high truck percentages, the actual truck counts are quite low.

Metro COG conducts traffic counts for the Clay County Highway Department upon request and has utilized tube counters and video recording devices to collect traffic data. Traffic data was collected at the following areas in the time since official count data was collected in 2015:

- 11th St just N of MB Johnson Park Entrance (Moorhead)
- (2) 15th Ave N between 34th and 40th St (Oakport Twp.)
- CR 2 between Hwy 75 and Comstock (Holy Cross Twp.)
- CR 9 between 15th Ave N and CR 18 (Oakport Twp.)
- CR 9 between 15th Ave N and Kroshus Dr (Oakport Twp.)
- 12th Ave S at Buffalo River (Glyndon Twp.)
- 70th Ave N between US 75 and 28th St (Oakport Twp.)
- 225th St between 15th Ave N and Meadow Ln (Hawley)
- 225th St just N of Hartford St (Hawley)
- 3rd St between CSAH 12 and 50th Ave (Moorhead Twp.)
- CSAH 1 between CSAH 20 and CSAH 26 (Moorhead)
- 15th Ave N between 34th St and CR 9 (Oakport Twp.)
- 15th Ave N between CR 9 and CR 90 (Oakport Twp.)
- 70th Ave N between US 75 and 28th St (Oakport Twp.)
- 70th Ave N between US 75 and Oakport St (Oakport Twp.)
- CSAH 1 between 80th Ave N and 85th Ave N (Oakport Twp.)
- CSAH 1 between RR and CR 22 (Moorhead)
- Broadway St just S of 70th Ave N (Moorhead)
- CR 3 just N of 43rd Ave N (Moorhead)
- CR 9 between 43rd Ave N and CR 22 (Oakport Twp.)
- CR 9 just S of CR 26 (Oakport Twp.)
- CR 20 just W of Oakport St (Moorhead)
- CR 22 between US 75 and CR 13 (Oakport Twp.)
- CR 22 just E of 2nd St (Moorhead)
- CR 26 between CR 98 and CR 100 (Oakport Twp.)
- CR 26 between US 75 and Oakport St (Oakport Twp.)
- CR 96 just N of CR 26 (Kragnes Twp.)
- Oakport St between CR 20 and CR 22 (Moorhead)
- Oakport St just S of CR 26 (Oakport Twp.)

County Road 18 in Moland Township



CLAY COUNTY
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Figure 5.03 - Roadway Surface

Paving Type

- Paved (Asphalt, brick, concrete)
- Gravel
- Other (dirt, uninproved)

- 86 CR
- 52 CSAH
- 34 MN Hwy
- 75 US Hwy
- 94 Interstate

Source: Clay County (2021)

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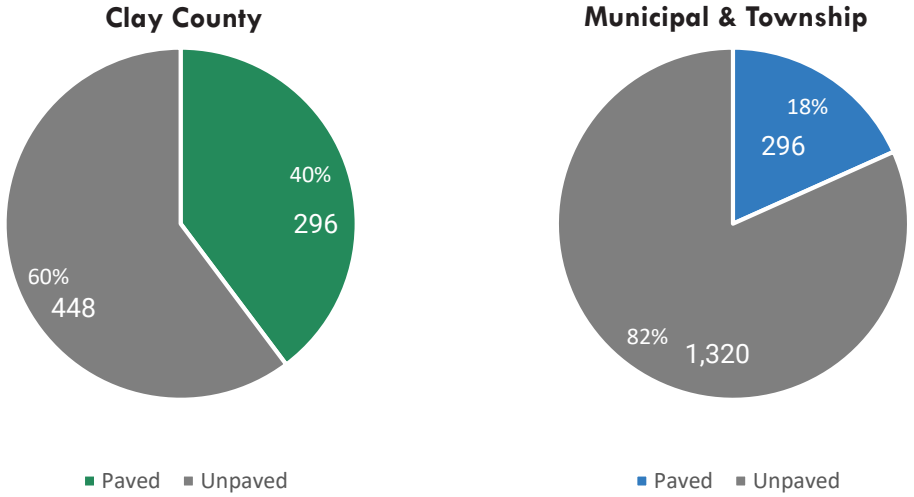
Figure 5.04 - Roadway Surfacing By Jurisdictional Owner (source: Metro COG)



Pavement

The 743 miles of County roadways (excluding State, Township, and Municipal roadways) are split 40-percent and 60-percent between paved (all pavement types) and gravel or unpaved surfaces, respectively. Paved roadways are typically found on higher traffic corridors or corridors with good connectivity to economic centers throughout Clay County. Gravel and unpaved roadways are typically found on low volume corridors.

Most traffic volumes may not justify investing in paving all roadways throughout the County however, consistent monitoring of traffic volumes is important to determine if paving may be more financially sustainable.

Pavement Management

The quality of Clay County's roads can be attributed to a high quality Pavement Management System.

Pavement Conditions

Through the Pavement Management System, the County monitors the condition of the highway surface of every segment of Clay County's roadways.

Table 5.1 - Average Pavement Condition Rating (source: Clay County)

Average Clay County Pavement Condition Rating			
Year	Ride Quality Index (RQI)	Surface Rating (SR)	Pavement Quality Index (PQI)
2011 - 2012	2.70	3.30	2.90
2012 - 2013	2.57	3.43	2.93
2013 - 2014	2.24	3.33	2.64
2014 - 2015	2.09	3.28	2.44
2015 - 2016	2.00	3.20	2.52
2016 - 2017	1.90	3.00	2.29
2017 - 2018	2.80	3.60	3.20
2018 - 2019	2.70	3.50	3.10
2019 - 2020	2.50	3.20	2.80

Table 5.2 - Pavement Condition Index Rating Scales (source: Clay County)

MnDOT Pavement Condition Indices		
Index Name	Pavement Attribute Measured by Index	Rating Scale
Ride Quality Index (RQI)	Pavement Roughness	0.0 - 5.0
Surface Rating (SR)	Pavement Distress	0.0 - 4.0
Pavement Quality Index (PQI)	Overall Pavement Quality	0.0 - 4.5

The Pavement Quality Index (PQI) is a composite index equal to the square root of the product of the pavement Surface Rating (SR) and the Ride Quality Index (RQI). PQI provides a more customer satisfaction approach to pavement management in Clay County. PQI is measured on a scale from 0 to 4.5 with 4.5 being high quality pavement and 0 being low quality pavement. See Table 5A for the average PQI ratings for Clay County since 2011. PQI is different than the Pavement Condition Index (PCI) which uses a 0 to 100-point scale with 100 being the smoothest pavement.

In the last several years, the PCI has been replaced by PQI because PQI is a more comprehensive approach to pavement management and applicable performance measure standards. However, PQI is based on data that Clay County and MnDOT were already collecting. Table 5B shows the pavement condition indices utilized by Clay County and MnDOT.

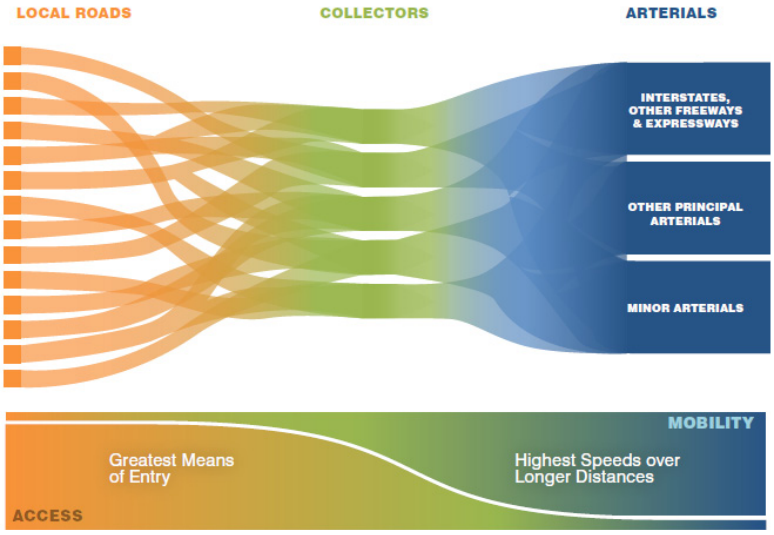
Pavement quality is widely recognized as important for a traveler's satisfaction and the long-term performance of the roadway, and can also affect road noise. A smoother pavement surface provides a more comfortable ride for the traveler. A highway free of cracks and potholes also requires less ongoing maintenance and a longer lifecycle.

Clay County is currently in the process of adopting a pavement management plan which will set a formal PQI threshold for the County.

The formal PQI threshold will establish a performance measure standard that can be used to help prioritize investments on the Clay County transportation system and identify short- to long-term investment strategies.

Developing and adopting a Pavement Management Plan is a very important short-term implementation step for Clay County. The Pavement Management Plan should be used to identify roadway rehabilitation and reconstruction projects for inclusion into the County's Capital Improvement Program (CIP) and help achieve the County's goal of providing a high quality transportation system.

Figure 5.05 - Roadway Functional Classification Relationship (source FHWA)



Functional Classification

The functional classification defines a roadway's purpose, use, and the attributes necessary to provide for the safe and efficient movement of vehicles. Metro COG's MTP, *Metro Grow*, lays the groundwork for a functional classification system for roadways based on the transportation service provided (e.g. degree of mobility) and the relationship to adjacent land uses (e.g. degree of access). The system creates a hierarchy of roadways that provide direct access to local streets, collect traffic from local streets, and distribute traffic to the regional highway system.

Each roadway type is critical to providing a roadway network that meets the needs of all users. For example, if an area lacks a robust collector roadway system, then the principal and minor arterial roadway system will not only need to provide mobility for those moving through the area but will also need to provide direct access to adjacent land uses. This may result in roadways that serve too many functions leading to safety and capacity problems.

The general description of each of the four classifications in the Functional Classification System may be found on the following pages.

Table 5.3 - Roadway Functional Classification Mileage (source: Clay County & MnDOT)

FEDERAL FUNCTIONAL CLASSIFICATION MILEAGE			
	Clay County	**Townships**	**Local/State/County Total***
Interstate	0	0	**27**
Principal Arterial	9	0	**33**
Minor Arterial	15	2	**142**
Major Collector	387	23	**221**
Minor Collector			**195**
Local	332	847	**1505**
*Includes all of Clay County including Municipalities			
Source: MnDOT			

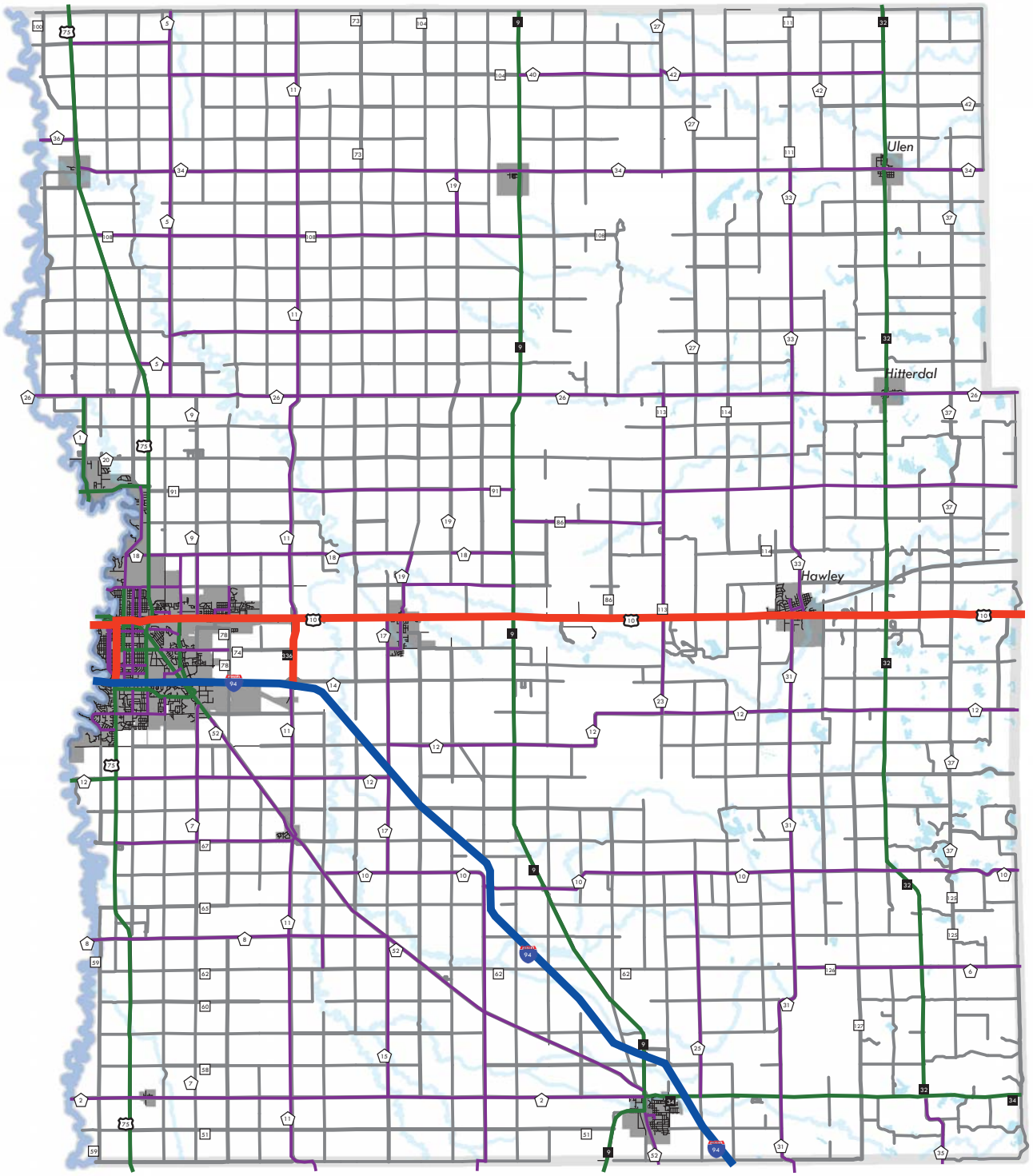


Figure 5.06 - Federal Functional Classification (FFC)

Source: Clay County (2021)

Federal Functional Classification

- Interstate
- Principal Arterial
- Minor Arterial
- Collector
- Local

- 86 CR
- 52 CSAH
- 34 MN Hwy
- 75 US Hwy
- 94 Interstate

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CLAY COUNTY COMPREHENSIVE PLAN

Principal Arterials

Principal arterials typically have the highest traffic volumes and are considered part of the National Highway System (NHS). These highways are intended to connect economic centers of regional importance with one another, including major business concentrations, important transportation terminals, and large institutional facilities to provide greater regional mobility. The principal arterials in Clay County are all owned and operated by MnDOT. They include Interstate 94 (I-94), United States Highway 10 (US 10), US 75, and Minnesota Highway 336 (MN 336). Future improvements along US 10, US 75, MN 336, and parts of the I-94 corridor through Clay County will provide safer and more efficient operations of principal arterials as part of the NHS.

Minor Arterials

Minor arterials place a priority on mobility and higher average travel speeds, while providing managed access to the local system. These roadways connect important locations within the County to the FM Area and other regional destinations. In addition, minor arterials connect locations within the urbanized area to cities and towns outside of the metropolitan region and connect freestanding small towns to each other.

Minor arterials are spaced at least 15 miles apart across rural Clay County however, the spacing is less near the urbanized portions of the FM Area. Within the County, minor arterials are mostly owned and operated by MnDOT as US Highways or by the County as County State Aid Highways (CSAH) Examples of these highways in Clay County include portions of US 75, MN 9, MN 34, and Broadway Street NW or CSAH 1.

Collectors

Collectors serve shorter trips and allow more direct access from local streets and driveways. These roadways collect and distribute traffic to the arterial system from rural areas across Clay County including commercial and industrial areas in the FM Area.

Collectors are spaced about four miles apart across Clay County however, the spacing is less near the urbanized portion of the FM Area. The collectors in Clay County are owned and operated by the County, Cities, and Townships. Examples of collectors are CSAH 52, 160th Avenue S or CSAH 2, 230th Street S or CSAH 31, 90th Avenue S or CSAH 10, 70th Street N or CSAH 11, and 90th Avenue N or CSAH 26.

Local Roadways

Local streets connect to the most rural areas of the County where people may live, conduct business, or go about their daily lives. Local roadways typically prioritize lower speeds and higher access ahead of mobility. These roadways are typically spaced about one mile apart in a majority of Clay County however, in developed pockets of the County, local roadways occur every block.

Local streets are owned and operated by the County, Cities, or Townships depending on the location.

Safety

A comprehensive, system wide, and data-driven analysis was conducted for crashes occurring from 2016-2020 within Clay County. Specifically, Metro COG analyzed crashes that occurred within 100-feet of Clay County maintained or township maintained roadways or those roadways not maintained by a local municipality or the State. While the total number of severe crashes may be significant, the actual number of severe crashes occurring at any given location is very low.

Crash Analysis

Between 2016 and 2020 there were 26 severe (fatal and incapacitating injury) crashes on all roadways owned and operated by Clay County or a Township (6 fatal and 20 incapacitating injury crashes).

- 11 crashes were single vehicle run off road crashes including overturn/rollover crashes and utility/light pole crashes
- 7 crashes were intersection-related crashes including angle crashes
- 3 crashes were front to front or head on crashes
- 2 crashes were front to rear or rear end crashes
- 2 crashes were listed as single vehicle other crashes
- 1 crash was listed as a pedestrian crash

The *Clay County Roadway Safety Plan* was adopted in 2008. The Highway Department has completed a considerable number of projects identified in the 2008 Safety Plan and still utilizes the plan to pursue federal Highway Safety Improvement Program (HSIP) dollars.

Clay County, in partnership with MnDOT, is currently undergoing a process to update the 2008 plan. The new County Roadway Safety Plan has a tentative completion date of December 2022. Safety remains one of the highest priority goals and objectives of the Transportation Plan and will be guided by the *Minnesota Strategic Highway Safety Plan* (2020) which is an integral part of Minnesota's Toward Zero Deaths program. The Toward Zero Deaths program will also be a cornerstone in the development of the *Clay County Roadway Safety Plan* update (in progress). The Transportation Plan should reference the future goals, policies, and implementation priorities that come out of the updated safety plan.

The ongoing update of the Clay County Roadway Safety Plan is of utmost importance in the short-term for Clay County. The plan should be used to identify safety projects at existing unsafe locations and proactively identify unsafe locations for inclusion into the County's Capital Improvement Program (CIP). The plan is critical for achieving the County's goal of providing a safe transportation system. The plan will also be critical to pursue Highway State Improvement Program (HSIP) funds.

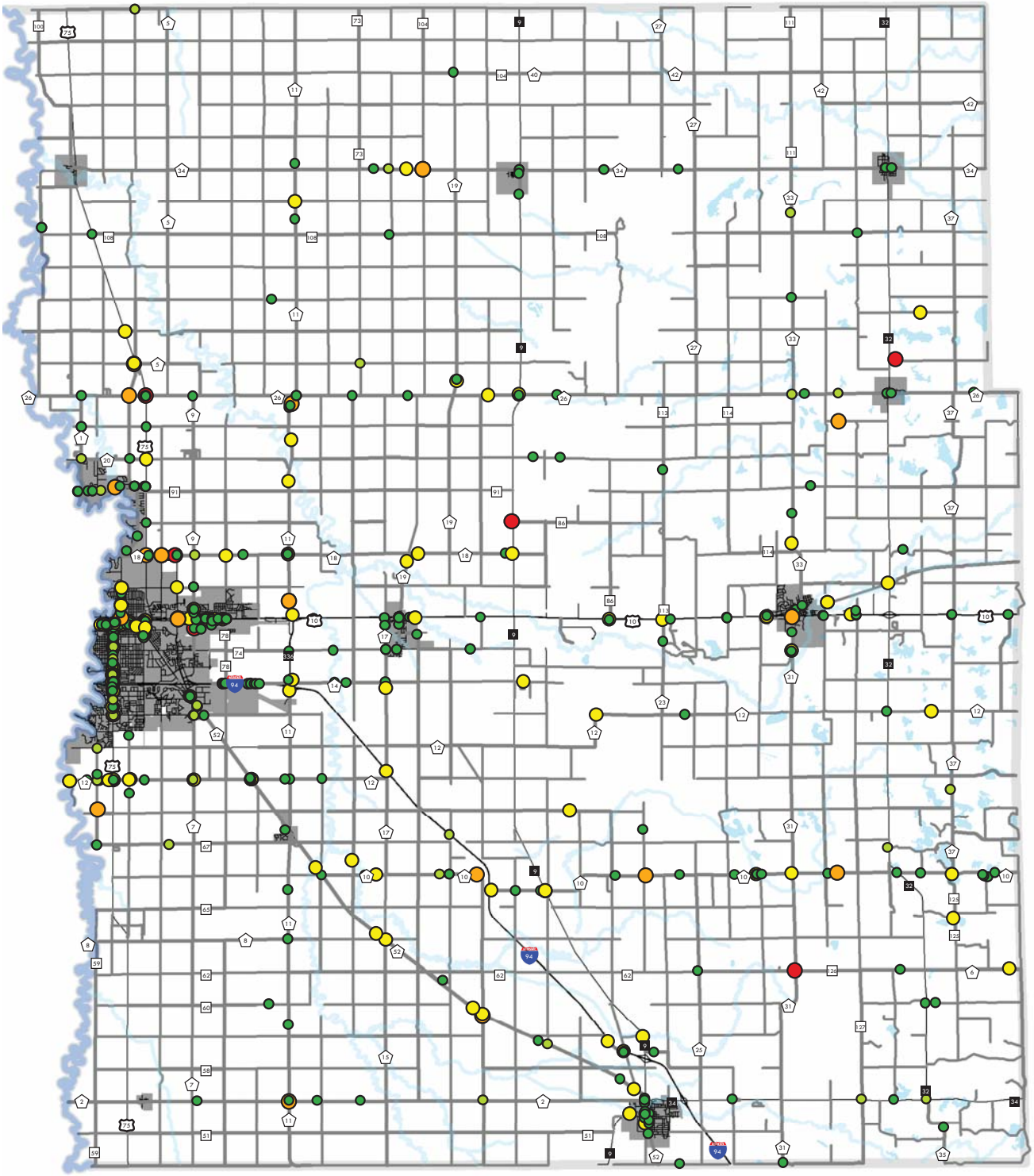


Figure 5.07 - Crashes within 100' of Clay County or Township Road

Crash Severity

- Fatal
- Serious Injury
- Minor Injury
- Possible Injury
- Property Damage Only

Source: MnDOT (2021)

86 CR | 52 CSAH | 34 MN Hwy | 75 US Hwy | 94 Interstate

Maintained by Clay County or Township

Maintained by Other Jurisdiction

N

CLAY COUNTY COMPREHENSIVE PLAN

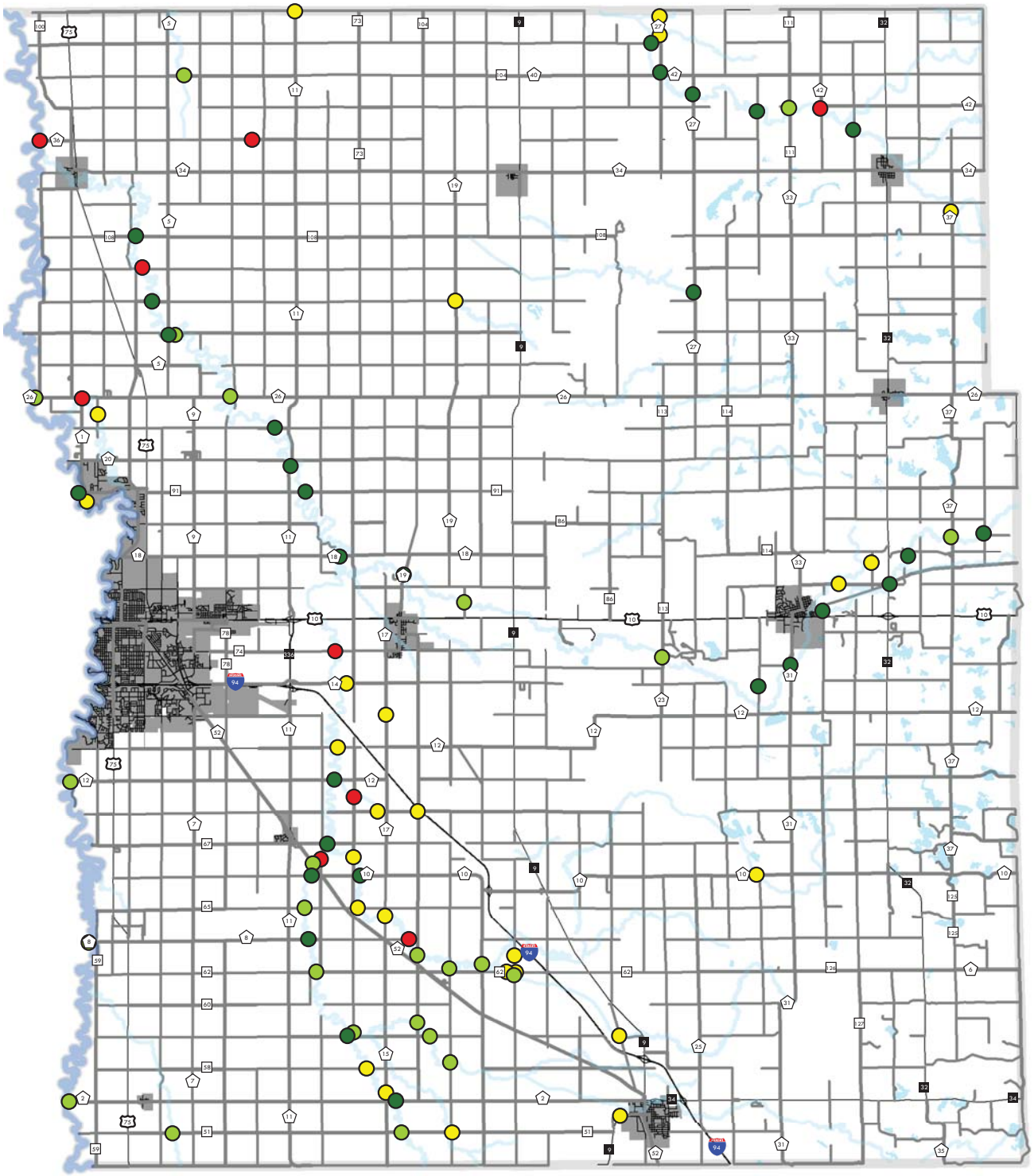


Figure 5.08 - Bridge Sufficiency Rating

Source: Metro COG (2021)

Bridge Sufficiency

- Less than 50
- 50 to 74
- 75 to 89
- 90+

86 CR · 52 CSAH · 34 MN Hwy · 75 US Hwy · Interstate

Maintained by Clay County or Township

Maintained by Other Jurisdiction

N

CLAY COUNTY COMPREHENSIVE PLAN

Bridges

Clay County maintains 55 bridge structures, 49 bridges span more than 20 feet. Of these structures, nearly 11-percent were built before 1960. Bridges built prior to 1960 are often functionally obsolete due to width, height, and weight restrictions however, this is not the case in Clay County as two of the ten bridges built before 1960 are Structurally Deficient and the remaining are Adequate.

Of the 49 bridges greater than 20 feet, 67-percent have a sufficiency rating of 80 or greater with another 31-percent having a sufficiency rating between 50 and 80. Just 1 bridge (2-percent) has a sufficiency rating below 50.

Bridge Evaluation and Prioritization

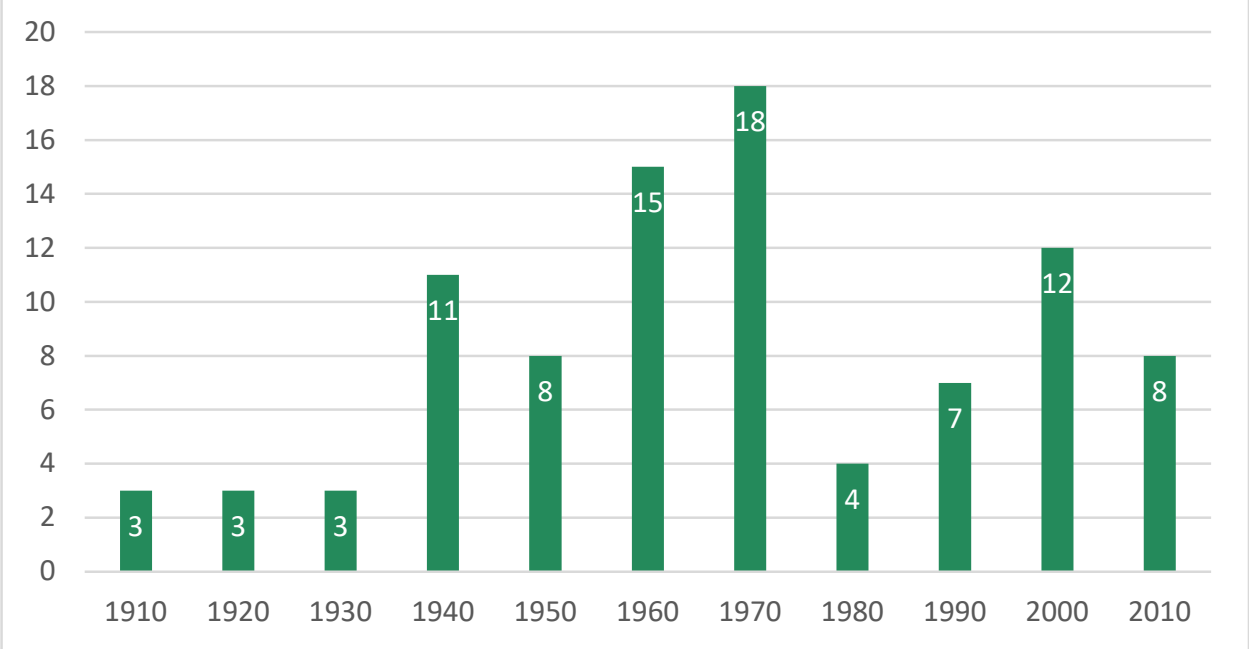
A County bridge prioritization was performed based upon existing inventory of structures from the most recent National Bridge Inventory (NBI) inspection reports for Clay County. The analysis assumes that existing bridges in the 2021-2025 Clay County Capital Improvement Plan will remain the highest priorities for future investment. Clay county also maintains a bridge prioritization list of 17 structurally deficient bridges that the County intends to replace, rehabilitate, or remove as soon as possible when funds are available.

Beyond the top 22 structures (those in the CIP and prioritization list), the analysis flagged two other bridges that are structurally deficient and four which are functionally obsolete.

Bridges are prioritized based upon sufficiency rating, posting limit, and average structure condition.

- First, bridges were categorized into sufficiency categories by sufficiency rating: bridges less than 50, those between 50 and 74, those between 75 and 89, and those 90 and above.

Figure 5.09 - Bridges Built by Decade (source: Clay County)



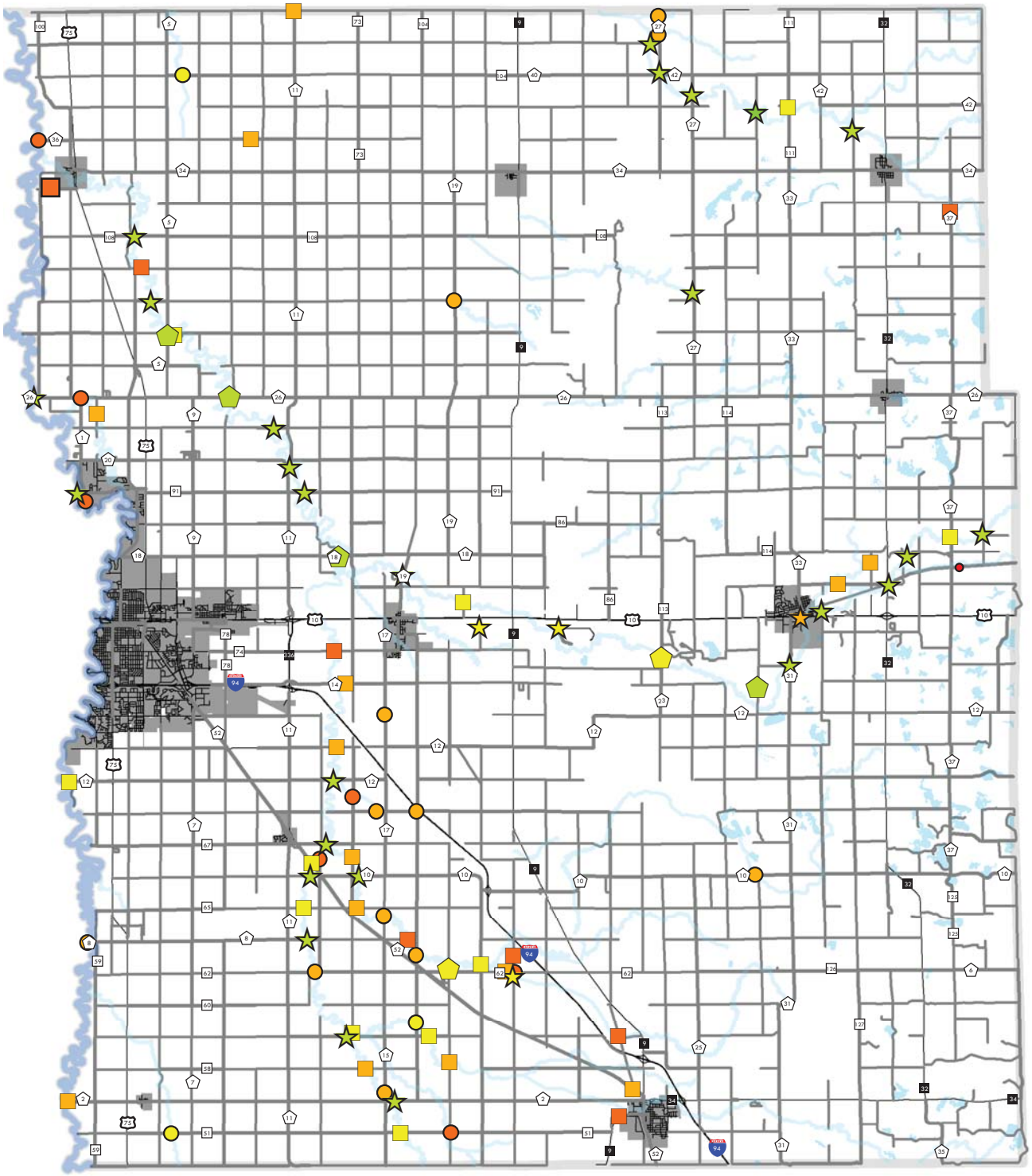


Figure 5.10 - Bridge Average Condition and Prioritization

Source: Metro COG (2021)

Average Condition
- 4.0 - 5.0
- 5.1 - 6.0
- 6.1 - 7.0
- 7.1 - 8.0
- 8.1 - 9.0

Priority Timeframe
- Programmed
- 2026-2030
- 2031-2035
- 2036+

86 CR
75 US Hwy
52 CSAH
Interstate
34 MN Hwy

N

CLAY COUNTY COMPREHENSIVE PLAN


State Highway 32 near Ulen

► After categorized into sufficiency categories, bridges were prioritized based upon three planning-level criteria: sufficiency rating, deficiency status, bridge status, and average structure condition. Structure condition is based upon the average rating of the superstructure, substructure, and deck rating.

► Analysis and prioritization within each sufficiency bin was completed based upon deficiency status (i.e. structurally deficient, functionally obsolete, adequate), bridge status (i.e. open, closed, load posted), and the average structure condition. This method was used to sort the remaining 71 bridges after the 22 programmed and priority bridges as previously mentioned. The prioritization is more useful to identify bridges prioritized between 23 and 61, as these structures will certainly need more investment and evaluation over the comprehensive planning process (2045).

Planning-Level Cost Assumptions

Planning-level cost assumptions were developed for bridge replacements. Bridge cost was developed using the following:

► National Bridge Inventory information regarding length and deck width.

► Deck width for bridges was only adjusted with direction from the Clay County Highway Department or if deck width seemed inadequate for the existing roadway.

Table 5D - Estimated Bridge Replacement Cost by Timeframe (source: Metro COG)

Bridge Ranks	Timeframe	Estimated Replacement Cost (2021 $)
1-22	Programmed	$ 17,493,121.64
23-55	2026-2030	$ 11,937,203.41
56-62	2031-2035	$ 14,115,263.66
62-93	>2035	$ 43,919,008.28

► Planning-level costs are based upon the *2019 Calendar Year - Bridge Cost Report* published by MnDOT's State Aid Bridge Office. The 2019 costs as found in the bridge cost report were inflated to 2021 dollars by assuming a four percent inflationary rate per year to estimate 2021 dollar amounts.

Bridge replacement costs are used only to signify structural investments and define the value of major infrastructure on the current system. The tool should be used to identify and prioritize bridge or structure rehabilitation in the short-, mid-, and long-term for Clay County and is not a policy direction to replace every bridge in the given timeframes. The prioritization list of bridges is subject to change as bridge inspections or other variables may change outside of Clay County's control.

Culverts

Clay County inspects 246 culvert structures. Metro COG has excluded these from the bridge inventory analysis because the culverts cost much less than bridges and are highly rated from a sufficiency rating standpoint.

Metro COG did not find any structurally deficient culvert structures outside of what Clay County already has programmed in the 2021-2025 construction program and found only one culvert that was load posted, that may need priority replacement in future construction improvement programs (CIP).

Airports

There are nine airports in Clay County including two general aviation airports (Hawley Municipal and Moorhead Municipal Airports) and six private airports (includes Barnesville Municipal Airport, which is publicly owned).

The Hawley Municipal Airport has one asphalt runway and is located two miles west of the City of Hawley. Based upon Federal Aviation Administration (FAA) data for a 12-month period ending June 30, 2019, there are 33 aircraft based on the field including 32 single-engine airplanes and one helicopter. Operations include approximately 24 aircraft a day on average with 53-percent of flights considered local and 47-percent of flights considered transient.

Cropdusting Operations Caption in Felton Township

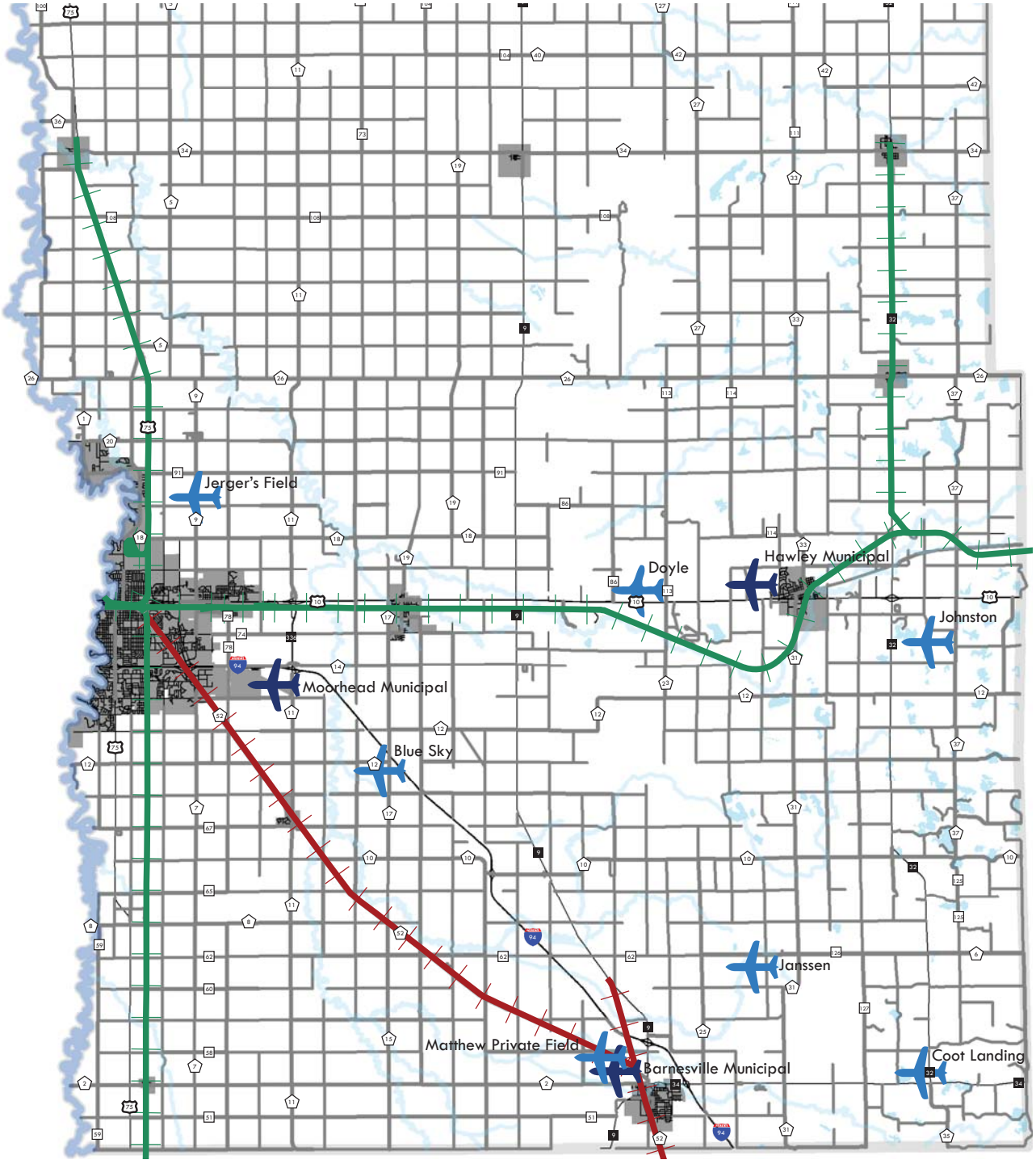


Figure 5.11 - Airports and Railroads

Railroads
- Burlington Northern Santa Fe
- Ottertail Valley

Airport Ownership
- Private
- Public

Source: MnDOT (2021)

- 86 CR
- 75 US Hwy
- 52 CSAH
- 94 Interstate
- 34 MN Hwy

N

CLAY COUNTY COMPREHENSIVE PLAN

The Moorhead Municipal Airport has one asphalt runway and is located two miles east of the City of Moorhead. Based on FAA data for a 12-month period ending May 31, 2018, there are 47 aircraft based on the field including 42 single-engine airplanes and five multiple-engine airplanes. Operations include approximately 25 aircraft a day on average with 67-percent of flights considered local and 33-percent of flights considered transient.

The Barnesville Municipal Airport has one grass runway and is located one mile northwest of the City of Barnesville. Based on FAA data for a 12-month period ending May 30, 2001 there are no aircraft based on the field and operations include approximately 200 transient flights a year.

Virtually all commercial flights in the region come in out of Hector International Airport, which is a civil and military airport that serves the Fargo Air National Guard, commercial passenger airlines (Allegiant Air, American Airlines, Delta Airlines, and United Airlines), and cargo carriers (Alpine Air Express, Encore Air Cargo, FedEx, Martinaire, and UPS Airlines). In 2019, which was the busiest year on record for the airport, Hector International Airport served more than 930,000 passengers, an 11-percent increase from 2018's 843,000 passengers. 2019 was also a record year for air cargo, with 6,203 aircraft landing with a weight of 391,019,295 pounds of cargo as compared to 4,607 aircraft landing with a weight of 275,305,359 pounds of cargo in 2018.

With the continued growth and air-traffic at Hector International, the demand for smaller general aviation airports is expected to continue to grow and may contribute to the surrounding local economy of Clay County.

Management Tools

The following tools will help provide safe and efficient operation of existing roadways and tools on how to expand, preserve, realign, maintain, and/or operate the roadway network throughout Clay County. The management tools also need to respond to the rural and urban character of the county to preserve different corridors for different types of character. The rural nature of Clay County is an important feature to residents, which makes the juxtaposition and transition of rural areas to urban areas all the more critical when analyzing the management strategies for corridors, including where the rural character should be preserved and how transportation management tools may assist in that.

Access Management

Access management guidelines are used to enhance safety and maintain the capacity and mobility of important transportation corridors. The guidelines balance these needs with ability to access private property. Standardized guidelines communicate the expectations of the permitting agencies to the developer, landowner, or organization that may request access to the County roadway network. The guidelines promote responsible access practices such as:

- Using existing access points
  - Providing adequate spacing to separate and reduce conflicts.
  - Supporting indirect access rather than direct access on arterial routes.
  - Aligning operations with the functional classification.

Table 5E - Access Spacing Standards (source Clay County)

Road Classification	Spacing Between Roadways (ft)		Spacing between Driveways (ft)		
	Full Access	Limited Access	Posted Speed Limit		
			< 35 MPH	35 - 45 MPH	> 45 MPH
Major Arterial	NA	NA	Not Permitted		
Minor Arterial	1320	660	330	660	660
Collector	660	330	160	330	330
Local Road	330	120	50	160	160

Clay County's access spacing guidelines conform to the MnDOT access management standards and such applicable standards developed for the FM Area through Metro COG's regional transportation planning process. These guidelines inform decisions about the proper location and type of access to County roadways as development or redevelopment occurs adjacent to County roadways or when county roadways are expanded or reconstructed. The County regulates access management through the Clay County Development Code and guidance from the Access Management Policy which was adopted in 2012.

► Applicability: Pursuant to Minnesota State Statute §160.02, §160.08, and §160.18 the County Board under the auspices of the statutorily defined "road authority" has the ability to designate, locate, improve, and maintain controlled-access highways for public use as deemed appropriate. Further, the road authority has the ability to design, regulate, restrict or prohibit access pursuant to terms and conditions as specified by the County. As noted in §160.02, this authorization applies to all "highways" under the County's purview, inclusive of County Highways, County State-Aid Highways, and township roads.

Specific Clay County standards, as found in the County's code or regulations, related to traffic control and access management include the following:

► District highway engineer or county highway engineer must approve the location and specifications of access points.

► Access points from state and county roads, streets, or highways may not be wider than 35-feet.

► Access points and internal subdivision roadway design shall conform with the standards of the MnDOT access management requirements and such applicable standards as developed for the FM Area through Metro COG.

► 4 of the 9 zoning districts in Clay County have prescribed standards for access point spacing that varies by functional classification.

► Access management plans are required for any commercial and industrial use in the County through all conditional use, rezoning, platting or subdivision requests adjacent to I-94, US 10, US 75, MN 336, MN 9, MN 32, or MN 34. Access management plans shall highlight the following:

- Locations and widths of proposed vehicular access drives
- Locations and widths of any internal roadways
- Locations and dimensions of parking and loading areas

- New subdivisions may not have direct access to an arterial roadway

Clay County Highway and Planning Departments may work together to update the access management policy and other regulatory code language. For example, the 35-foot access point maximum width listed previously, is greater than the maximum standard which the Highway Department has for access points (32-feet).

Clay County has built-in flexibility to review and approve access based upon the latest guidance from the Highway Department, Metro COG, and MnDOT technical staff. Highway Department staff are involved in decisions as part of official development procedures within the County which provides numerous touch-points at various stages of the development process to make recommendations and discretionary decisions about access management. This also allows the County to more easily update standards outside of the official code of regulations, which is a quicker and more efficient process than the process required to amend the County's regulatory language.

Highway Department and Planning staff indicated that the ordinance language and access management policy has been working well in recent years but also had a couple areas of concern. For example, the current access management guidance is not friendly to higher density or urban developments, contains ambiguous language in areas, and may not respond to farmers' exact want or need for field access.

The County should also consider minimizing unnecessary access to roadways and consolidating, as applicable, locations where improvements such as turn lanes, traffic signals, and roundabouts may mitigate traffic conflicts. In addition to spacing and dimensional standards, other principles of access management may be employed for example, Clay County may:

- Require a permit for change in use of an existing access

- Limit highway or roadway access to one access per parcel, property, or operation
- Require a shared access point with an adjacent parcel

- Stipulate that parcel access must occur at a particular location where sight distance is optimal

- As a condition of access permit approval, require removal of other pre-existing access points and may require the applicant to mitigate the traffic safety and operational impacts of the proposed new access through the installation of various roadway improvements including but not limited to turn lanes, traffic signals, or roundabouts.

Right-Of-Way Acquisition Strategies

When future expansion or realignment of a roadway is proposed, but not immediately programmed, Clay County should consider right-of-way acquisition strategies to reduce costs and maintain the feasibility of the proposed improvement. The most common strategies used to preserve right-of-way for future construction include advance purchase, eminent domain, planning and zoning, and official mapping. Before implementing any right-of-way preservation programs, the county should weigh the risks of proceeding without environmental documentation prior to purchase. If environmental documentation has not been completed, agencies risk preserving a corridor or parcel that has associated environmental issues.

Advance Purchase

One of the best ways to preserve right-of-way is to purchase it. Unfortunately, Clay County may not have an abundance of funds to purchase right-of-way in advance, and the public benefit of purchasing right-of-way is not realized until the roadway or transportation facility is built. Typically, local jurisdictions including Clay County use other corridor acquisition methods prior to roadway construction and then purchase the right-of-way at the time of design and construction however, if there is confidence about roadway expansion or preservation of right-of-way, advance purchase can save money on right-of-way acquisition costs in the long-term.

Eminent Domain

The county can also acquire lands by eminent domain, including quick-take and condemnation actions, if good faith negotiations are not successful.

The use of eminent domain is used only when other negotiations to acquire property have failed, and is guided by Minnesota Session Laws - 2006, Regular Session, Chapter 214 - S.F.No. 2750.

Planning and Zoning

Through Clay County's zoning authority there are a number of tools for preserving right-of-way for transportation projects. These tools include:

- Zoning - If the property is in a very low-density area (e.g., agricultural district), the County should try to maintain the existing zoning classification. A lower zoning classification limits the risk for significant development to occur before funding becomes available for roadway construction.

- Platting and Subdivision Regulations - Local platting and subdivision regulations give Clay County the authority to consider future roadway alignments during the platting process. The County currently uses the official land development processes to influence plat configuration and the location of proposed roadways. In most instances, planning and highway staff work with developers to configure a plat that accommodates the landowners' and developers' desires and conform to the long-term community vision and applicable plans, such as the Clay County Comprehensive Plan. Clay county requires right-of-way dedication as part of the platting and subdivision process.

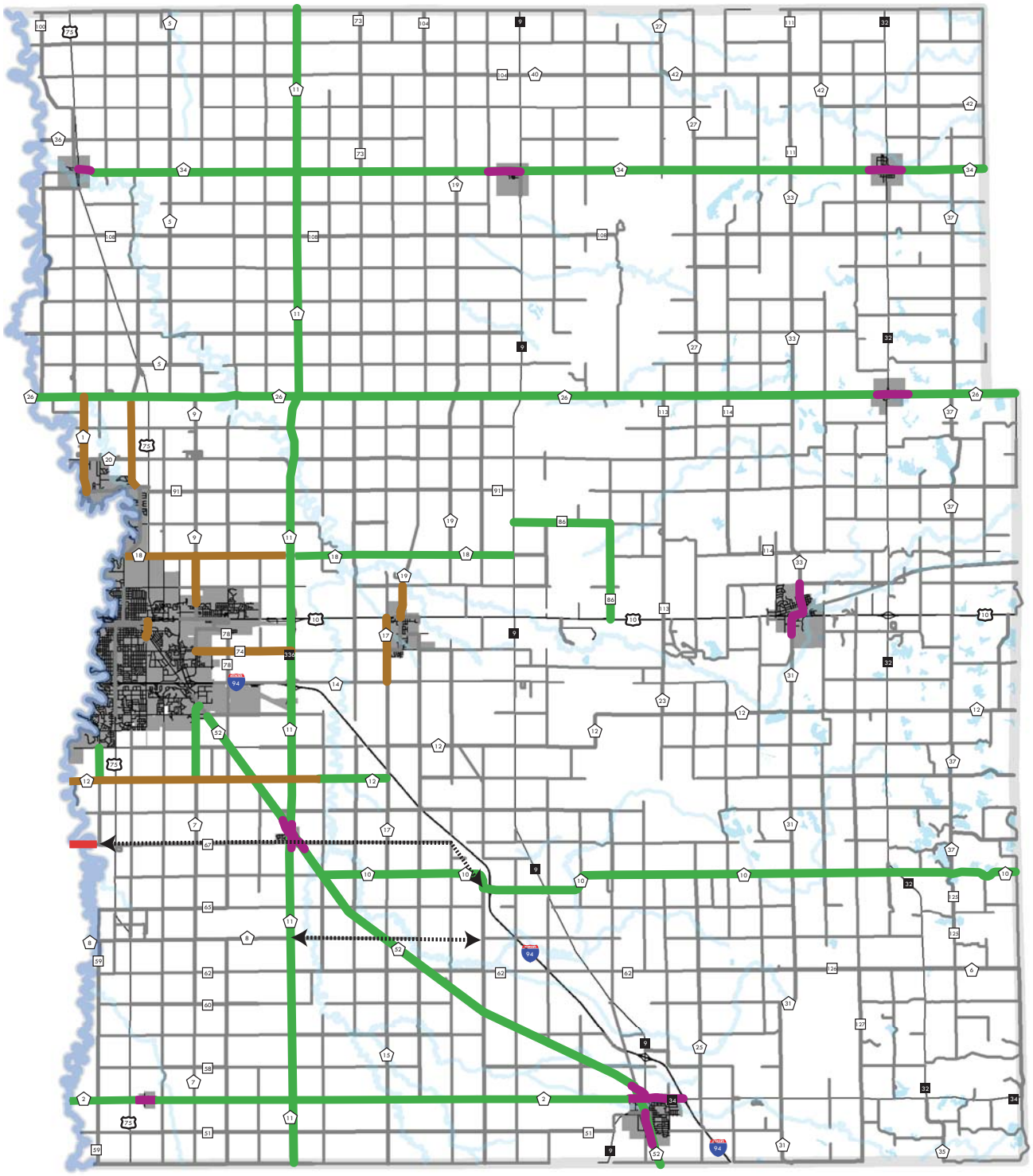


Figure 5.12 - Corridor Management

Corridor Typologies

- Rural Preservation
- Urbanizing
- Small Town
- Future Arterial Bridge Crossing
- Corridor Preservation

Source: Metro COG (2021)

- 86 CR
- 52 CSAH
- 34 MN Hwy
- 75 US Hwy
- 94 Interstate

N

CLAY COUNTY COMPREHENSIVE PLAN

- Transfer of Development Rights - The county may consider using this tactic to give developers certain flexibility beyond the standard requirements of the development code if the developer transfers right-of-way to Clay County for the future roadway(s) or infrastructure needed by the development. This incentivizes the developer to dedicate necessary right-of-way that the County may require.

Official Mapping

Clay County can adopt an Official Map, as defined by MN State Statute §432.352, that identifies existing County roads and County state-aid highways, proposed future County roads and highways, the area needed for widening existing county roads and highways, and existing and future state trunk highway rights-of-way. An Official Map may also show the location of existing public land and facilities and other land needed for future public purposes, including public facilities such as parks, playgrounds, schools, and other public buildings, civic centers, airports, and travel service facilities. After a public hearing and official adoption process, the jurisdiction can incorporate the Official Map into the County development code.

The official mapping process allows public agencies to have finer control over proposed development within an identified area that may influence development on adjacent parcels. This process also protects the County from paying for unpermitted structures that may be located within future identified public facilities.

The official mapping process should only be used for preserving key corridors in areas with significant growth pressures. In some cases, official mapping of key parcels/ corridors may increase the agency's ability to find sources of funds to purchase at-risk parcels.

Right-of-way acquisition is typical for major transportation projects and Clay County should employ strategies to prepare for major construction projects. In the short-term for example, right-of-way acquisition strategies should be pursued for the 80th Ave S/CR 67 Red River bridge crossing, Heartland Trail, and identified future arterial corridors.

Corridor Management Strategies

Transportation from a Countywide perspective is critical to connecting communities and supporting economic development. Three corridor management strategies are provided below and take into consideration the juxtaposition of the rural character of Clay County and the nearby urban FM Area. It is important to Clay County residents that the rural character is preserved and any transition of corridors to become urbanized should be strategically considered and analyzed. Figure 5.12 shows which roadways have been identified by Clay County and Metro COG for special roadway management considerations in the future.

Rural Preservation Corridors

Rural corridors are evaluated for a series of issues focusing most specifically on surface and pavement management. This analysis provides recommendations and considerations for potential pavement management strategies as well as possible considerations for conversion of various roads from township to county jurisdiction, or vice versa.

Management strategies for rural corridors are very different than the considerations of urbanizing corridors in Clay County. The County will be responsible for these rural corridors well beyond the planning horizon of the transportation plan and will need to develop a fiscally sustainable plan to ensure proper operations and maintenance. A key consideration will be surface recommendations based upon daily traffic, heavy vehicle usage, current pavement condition, and regional significance.

CR 86 - from US 10 to 43rd Ave N and to MN 9

CR 86 is a gravel roadway which connects to 43rd Ave N and also carries a lot of truck freight traffic to and from aggregate mining operations and Taracon Precast. Freight traffic generated near this segment tends to travel south toward US 10 but may also travel west toward MN 9.

CR 86 is a gravel roadway from MN 9 to 170th St N and 43rd Ave N to 15th Ave N, south of 15th Ave N is paved.

Between 15th Ave N and US 10, Clay County maintains CR 86 as an asphalt 2-lane with paved shoulders. At the intersection with US 10, CR 86 has a right turn lane for southbound freight traffic to turn west on US 10.

US 10 also has a 1,500-foot acceleration lane to accommodate westbound freight vehicles turning west on US 10.

- **Issues**
  - Gravel roadways in Clay County have a 5-ton per axle weight restriction in the spring.
  - Growing freight traffic in this area may increase maintenance and other infrastructure projects in the area.
  - Left-hand turns for southbound traffic to turn east on US 10 are significantly more challenging, as vehicles including commercial freight vehicles must cross a median and then turn left onto US 10, merging into the 'fast' travel lane on US 10 which has a speed limit of 65 MPH.

- **Opportunities**
  - Continue to monitor freight traffic and related maintenance and lifecycle costs on this roadway segment. The County should analyze if and when it may ever be more cost effective to pave part or all of CR 86, likely when freight traffic or other industrial operations grow to a point where it makes more fiscal sense to pave.
  - Partner with MnDOT to implement a project at the CR 86 and US 10 intersection, especially for left turns onto eastbound US 10, to increase multi-modal safety of freight and other modes of traffic.
  - Partner with MnDOT to implement a project at the CR 86 and MN 9 intersection to increase multi-modal safety of freight and other modes of traffic.

CSAH 10 - from CSAH 52 to Becker County

CSAH 10 is an asphalt roadway which connects CSAH 52 to I-94, where there is an existing interchange, and extends eastward into Becker County. CSAH 10 provides a critical and popular east-west route across Clay County.

The paved 2-lane collector roadway also has paved shoulders which vary in width from 4-feet wide to 8-feet wide. The interchange at I-94 and the east-west connection to popular lake destinations in eastern Clay and western Becker Counties makes CSAH 10 an important multi-modal corridor that accommodates freight, agricultural, and passenger vehicles.

- **Issues**
  - Clay County Highway Department is aware of some excessive speeds on CSAH 10, especially for eastbound vehicles during the summer months.
  - There have been three (3) serious injury crashes and numerous other less severe crashes on CSAH 10 that occurred between 2016 and 2020.
  - There are skewed intersections at major roadways including CSAH 52, MN 9, and MN 32 which may contribute to higher crash rates.
- **Opportunities**
  - As a collector roadway, Clay County should continue to regulate driveway access spacing pursuant to the Development Code. The balance between access and mobility should probably lean more towards mobility on CSAH 10.
  - The interchange with I-94 and continuity from the eastern boundary of Clay County to CSAH 52 provides a critical east-west route for residents, freight, and movement of agricultural equipment.
  - 8-foot paved shoulders should be implemented and maintained in future paving projects on CSAH 10. The corridor has also been identified as a priority investment route for bicyclists in the *State Bicycle System Plan*.
  - Safety improvements should be considered at skewed intersections and to address speeds along the corridor. Sightlines, signage, and stopping distances may be utilized to proactively identify locations for safety improvements along CSAH 10.
  - Preserve and prepare CSAH 10 for a future arterial roadway and bridge crossing of the Red River which may be located on the CR 67/80th Ave S alignment.

3rd St S - from CSAH 12 to CR 75

3rd St S is a gravel roadway just east of the Bluestem Amphitheater, just south of Moorhead's southern municipal boundary.

There is virtually no development or access points along the roadway with the exception of field access for agricultural land on either side of the corridor.

3rd St S is a popular route for traffic to and from the Bluestem Amphitheater, especially for people coming and going from CSAH 12. The roadway may also be used for Moorhead neighborhoods directly north of CR 75/50th Ave S.

► **Issues**

• Event traffic from Bluestem amphitheater may be causing excessive speeds and more general maintenance than would otherwise be necessary for this Clay County maintained gravel road. Depending upon the event, the traffic volumes (AADT) can triple on days where there is an event at the Bluestem Amphitheater.

• This area will likely experience long-term development pressure from the City of Moorhead.

► **Opportunities**

• Continue to monitor event traffic and related maintenance and lifecycle costs on this roadway segment. The County should analyze if and when it may be more cost effective to pave part or all of this portion of 3rd St S, likely when safety concerns, traffic volumes or development grows to a point where it makes more fiscal sense to pave.

• Clay County should proactively address safety concerns and potential intersection improvements at 3rd St S and CSAH 12.

• If and when paving or development occurs, Clay County should collaborate with Moorhead to turnover jurisdictional ownership to the City.

CSAH 7 - from CSAH 12 to CSAH 52

CSAH 7 is a paved 2-lane roadway with wide shoulders from CSAH 52 to just south of 41st Ave S. There is a mix of single-family residential development and agricultural land in this portion of CSAH 7 which creates a lot of multi-modal usage of the corridor from agricultural and passenger vehicles.

From just south of 41st Ave S to CSAH 12, CSAH 7 is a gravel roadway with very few access points aside from farmsteads and agricultural fields.

► **Issues and Opportunities**

• CSAH 7 is an interesting corridor in that it does have a mix of urban residential and agricultural land uses but is not located in Moorhead's immediate growth area.

• Clay County should continue to consider and preserve the agricultural character and multi-modal aspects of CSAH 7 until such time when Moorhead's urban area begins to grow southeast, which may be further away than the planning horizon of this plan (2045).

CSAH 12 - from CR 63 to CSAH 17

CSAH 12 is a critical east-west corridor near the urban FM Area, from CSAH 17 on the east, to the CSAH 12/52nd Ave S bridge over the Red River on the west. The surrounding land use is all agricultural however, the roadway provides a critical connection for multi-modal traffic including commuting passenger, agricultural, and freight vehicles.

► **Issues and Opportunities**

• CSAH 12 is unpaved from CR 63 to CSAH 17 but was prepared for paving several years ago before the project fell through. By paving the last segment of CSAH 12 and considering access management standards pursuant to the Development Code, CSAH 12 would increase multi-modal mobility between CSAH 17, a major north-south corridor, across the Red River, and into the urban FM Area.

• The agricultural character of CSAH 12 should be preserved.

• Provides a great option for Clay County residents traveling to and from the urban FM area, as bridge crossings of the Red River are few and far between.

CSAH 26 - from Red River to Becker County

CSAH 26 is a paved 2-lane roadway with paved shoulders that runs across the entirety of Clay County from and across the Red River on the west to Becker County on the east. CSAH 26 accommodates a lot of multi-modal agricultural, freight, and passenger vehicle traffic and provides mobility across the entire County. Seasonally, lake related traffic can be seen going to and from eastern Clay County and western Becker County on CSAH 26.

CSAH 26 goes through the City of Hitterdal on the eastern side of the County and different strategies should be applied. CSAH 26 - Hitterdal information can be found in the Small Town Corridors subsection.

► **Issues**

• Clay County Highway Department is aware of some excessive speeds on CSAH 26, especially for eastbound vehicles during the summer months.

• There have been two (2) severe crashes, one of which was a fatal accident, and numerous other less severe crashes on CSAH 26 that occurred between 2016 and 2020.

• Freight traffic may continue to grow, especially as FM Diversion construction activities continue to increase.

► **Opportunities**

• As a collector roadway, Clay County should continue to regulate driveway access spacing pursuant to the Development Code. The balance between access and mobility should lean more towards mobility on CSAH 26 as it provides a critical east-west connection across the entire County.

• 8-foot paved shoulders should be implemented and maintained in future paving projects on CSAH 26. The corridor has also been identified as a priority investment route for bicyclists in the *State Bicycle System Plan*.

• Safety improvements should be considered at any skewed intersections, to address speeds along the corridor, and consider multi-modal safety and mobility including freight and agricultural equipment. Sightlines, signage, and stopping distances may be reassessed to proactively identify locations for safety improvements along CSAH 26.

CSAH 52 - from Moorhead to Wilkin County

CSAH 52 is a paved 2-lane roadway with paved shoulders that runs diagonally across Clay County from Moorhead southern city limits and Wilkin County. CSAH 52 accommodates a lot of multi-modal agricultural, freight, and passenger vehicle traffic and provides mobility across the entire southern portion of the County.

CSAH 52 goes through the Cities of Sabin and Barnesville, providing a critical connection to the urban FM Area however, different strategies should be applied to the portions of CSAH 52 that run through small towns. CSAH 52 - Sabin and Barnesville information can be found in the Small Town Corridors subsection.

- **Issues**
  - Given the proximity to the Ottertail Valley Railroad, CSAH 52 runs diagonally across Clay County, creating numerous skewed intersections. Roads intersecting CSAH 52 have at-grade railroad crossings just to the east of the roadway.
  - CSAH 52 is also a very popular bicycle route because of the wide paved shoulders and small town destinations in Sabin and Barnesville.
  - Given the proximity to Moorhead, Sabin, and Barnesville, there may be growth and development near CSAH 52 in City growth areas
- **Opportunities**
  - As a collector roadway, Clay County should continue to regulate driveway access spacing pursuant to the Development Code.
  - The balance between access and mobility should lean more towards mobility on CSAH 52 as the roadway provides a critical connection between the FM urban area, small towns, and rural Clay County.
  - Wide paved shoulders should be maintained on CSAH 52 to promote multi-modal safety and contribute to safety of bicyclists on the roadway. Other bicycle safety enhancements may also be considered including, wider pavement striping, intersection improvements, lighting, and/or separate bicycle facility.
  - Safety improvements should be considered at skewed intersections with higher cross-traffic volumes. Any improvements should consider multi-modal safety and mobility including freight, agricultural equipment, bicyclists, and passenger vehicles.
  - Coordinate with Moorhead, Sabin, and Barnesville on CSAH 52's transition in growth areas to address not only access management and preserve the roadway as a collector roadway but to also address speeding and other safety concerns along CSAH 52 as it enters municipal boundaries.

CSAH 34 - from US 75 to Becker County

CSAH 34 is a paved 2-lane roadway with paved shoulders that runs across the entirety of Clay County from Georgetown on the west to Becker County on the east. CSAH 34 accommodates a lot of multi-modal agricultural, freight, and passenger vehicle traffic and provides mobility across the entire County.

CSAH 34 goes through the Cities of Georgetown, Felton, and Ulen, providing a critical east-west connection from small towns and other rural parts of Clay County however, different strategies should be applied to the portions of CSAH 34 that run through small towns. CSAH 34 - Georgetown, Felton, and Ulen information can be found in the Small Town Corridors subsection.

► **Issues and Opportunities**

• Freight traffic may continue to grow, especially as FM Diversion construction activities continue to grow.

• Multi-modal improvements may increase safety of agricultural, freight, passenger, and bicycle traffic on CSAH 34.

• As a collector roadway, Clay County should continue to regulate driveway access spacing pursuant to the Development Code. The balance between access and mobility should lean more towards mobility on CSAH 34 as the roadway provides a critical connection across northern Clay County.

• Coordinate with Georgetown, Felton, and Ulen on CSAH 34's transition near City limits to address not only access management and preserve the roadway as a collector roadway but to also address speeding and other safety concerns along CSAH 34 as it enters municipal boundaries.

CSAH 11 - from Wilkin County to Norman County

CSAH 11 is a paved 2-lane roadway with paved shoulders that runs across the entirety of Clay County from Wilkin County on the south to Norman County on the North. Portions of the roadway have paved shoulders wider than 4-feet but not all shoulders are considered bicycle-friendly as some sections of CSAH 11 have shoulders less than 4-feet wide. The roadway provides critical north-south mobility across the entire County.

Between I-94 and US 10, CSAH 11 becomes MN 336 and has interchanges at said principal arterial roadways.

► **Issues and Opportunities**

• Multi-modal improvements including wider paved shoulders may increase safety of agricultural, freight, passenger, and bicycle traffic on CSAH 11.

• As a collector roadway, Clay County should continue to regulate driveway access spacing pursuant to the Development Code. The balance between access and mobility should lean more towards mobility on CSAH 11 as the roadway provides a critical connection across the entirety of Clay County.

• Clay County should continue to monitor future arterial roadway routes or alignments and how those may impact traffic to and from any proposed arterial alignment and MN 336/CSAH 11.

CSAH 18 - from CSAH 11 to MN 9

CSAH 18 is a paved 2-lane roadway with paved shoulders that runs from CSAH 3 on the west to MN 9 on the east. The paved shoulders are wider than 4-feet. The roadway provides east-west mobility to and from rural areas of the County and north Moorhead.

East of CSAH 11, rural preservation tactics should be applied to CSAH 18.

- **Issues and Opportunities**
  - Pavement management strategies should continue to be maintained and an assessed to improve the overall quality of Clay County's roadway transportation system.
  - As a collector roadway, Clay County should continue to regulate driveway access spacing pursuant to the Development Code. The balance between access and mobility should lean more towards mobility on CSAH 18 as the roadway provides a critical connection across the entirety of Clay County.
  - Field access management and rural intersection safety strategies should balance agricultural operations, safety, and mobility on this segment of CSAH 18.
  - Clay County should continue to monitor future MN 336/CSAH 11 improvements and how that may impact traffic volumes on CSAH 18.

CSAH 2 - from Red River to Barnesville

CSAH 2 is a paved 2-lane roadway with paved shoulders that runs across the entirety of Clay County from and across the Red River on the west to Becker County on the east. However, east of Barnesville CSAH 2 becomes MN 34. CSAH 2 accommodates multi-modal agricultural, freight, and passenger vehicle traffic and provides mobility across the entire County. Seasonally, lake related traffic may be seen going to and from eastern Clay County and western Becker County on CSAH 2.

CSAH 2 goes through the City of Comstock in the southeast corner of the County and different strategies should be applied. CSAH 2 - Comstock information can be found in the Small Town Corridors subsection.

- **Issues**
  - Because of the mobility CSAH 2 provides across the County, some excessive speeds may be occurring on CSAH 2.
  - There was one severe crash at the intersection of CSAH 2 and CSAH 11, and a few other less severe crashes on CSAH 2 that occurred between 2016 and 2020.
  - Freight traffic may continue to grow, especially as FM Diversion construction activities ramp up.
  - Pavement management strategies should continue to be employed and an assessment of the overall quality of Clay County's roadway transportation system.

► **Opportunities**

• As a collector roadway, Clay County should continue to regulate driveway access spacing pursuant to the Development Code. The balance between access and mobility should lean more towards mobility on CSAH 2 as it provides a critical east-west connection across the entire County.

• Safety improvements may be considered at the intersection of CSAH 2 and CSAH 11 and other strategies may be implemented to address speeds along the corridor, and consider multi-modal safety and mobility including freight and agricultural equipment. Sightlines, signage, and stopping distances may be reassessed to proactively identify locations for safety improvements along CSAH 2.

• Field access management and rural intersection safety strategies should balance agricultural operations, safety, and mobility on this segment of CSAH 18.

• Pavement management strategies should continue to be employed and an assessment of the overall quality of Clay County's roadway transportation system.

Urbanizing Corridors

Urbanizing corridors are evaluated based on a series of transportation needs and factors such as development pressure, connectivity, and proximity to the FM Area or other cities within Clay County.

Urbanizing corridors are analyzed in terms of strategic development to ensure a smooth transition of these corridors from a rural to urban context. The analysis of these urbanizing corridors considers future roadway improvements and considerations for potential turnback of these corridors to adjacent urban communities. As will be shown, Clay County is likely facing several significant investment decisions in urbanizing corridors some of which should consider the rural character of the county and some of which should consider the urban fabric of the FM Area. Urbanizing corridors are those nearest to the cities of Moorhead and Dilworth in the Fargo-Moorhead Urbanized Area.

Some urbanizing corridors are candidates for turn back to a city road based on urban growth. In a typical turn back process, the County pays to improve the roadway to County standards or contributes that value to the City as part of a larger urban scale reconstruction if the roadway is to be improved beyond County standards (i.e. curb and gutter, sidewalks). After said improvements, the County gives jurisdictional authority including ownership and maintenance responsibility to the urban community. In this case, urban communities refers to Moorhead but is likely to include Dilworth when it's population exceeds 5,000. However, in the case of Dilworth, there may be instances where major scale investments are made on various County roads without the turnback of those corridors to the City.

Since 2004, Clay County has turned over 7.27 miles of roadway to the City of Moorhead. Over the life of this plan, there are likely to be multiple segments of County roads that will require significant investment and consideration for turning those corridors back to an adjacent city. Based on guidance from the County, a prioritized list of urbanizing corridors was evaluated regarding future potential investment needs and consideration for future turnback to a city.

The following list of roadways are those which the County should coordinate very closely (Planning and Highway Departments) to get a sense of development pressure and adjacent City or County growth.

CSAH 1 - from CSAH 22 to CSAH 26

Clay County is repaving CSAH 1 from CSAH 20 to CSAH 26 in 2022 and 2023. As a popular bicycle route, wider paved shoulders should be considered to enhance safety on CSAH 1. Part of the roadway is within Moorhead City limits and development pressure in the area is higher than other areas of Clay County. The City should continue to monitor access management and multi-modal safety, including bicycle and pedestrian infrastructure to accommodate residents in this area and provide greater mobility between the FM urban area and this part of Clay County.

The County should continue monitoring subdivisions and development near CSAH 1 and collaborate with City of Moorhead regarding when roadway urbanization and jurisdictional turnover may occur.

CSAH 9 - from Dilworth to CSAH 18

Although not in Dilworth's short-term growth area, CSAH 9 will likely see development pressure long-term due to it's proximity to Dilworth's residential and commercial growth areas.

The County should continue monitoring subdivisions and development near CSAH 9 and collaborate with the City of Dilworth regarding when roadway urbanization and jurisdictional turnover may occur.

12th Ave S/CR 74 - from 40th St S to MN 336

12th Ave S runs directly through Moorhead's growth area where there is a lot of current development pressure. Being on the edge of the urban area, 12th Ave S will likely continue to see urban development that will transition the character from agricultural to single- or multiple-family land use. East of CR 78, 12th Ave S becomes a low maintenance field access road. However, it does have access onto MN 336.

12th Ave S right-of-way should be preserved for a future Minor Arterial or collector roadway. Long-term, the roadway will enhance mobility through Moorhead, Dilworth (long-term growth area), and even Glyndon (short-term growth area) east of MN 336, providing another option to getting into and out of the FM Area.

The County should continue to monitor traffic volumes and growth near 12th Ave S, preserve right-of-way as necessary for future projects, and continue to regulate access management with a priority on mobility.

The County should continue to collaborate with City of Moorhead, Dilworth, and Glyndon regarding when roadway urbanization and jurisdictional turnover may need to occur but may consider paving the roadway sooner rather than later as a strategic roadway providing mobility to and from the Minnesota-side of the urban FM area and rural Clay County.

CSAH 17 - from CSAH 14 to US 10

CSAH 17 runs adjacent to the City of Glyndon's current growth area south of US 10. CSAH 17 ultimately provides mobility to Clay County residents between Glyndon/US 10, I-94, and CSAH 52.

The County should continue to collaborate with the City of Glyndon regarding access management and prioritize mobility along CSAH 17.

CSAH 19 - from US 10 to CR 84

CSAH 19 runs north of Glyndon and may experience some development pressures in the long-term.

Clay County should continue to collaborate with the City of Glyndon on access management and any development that may occur near CSAH 19 in the long-term.

CR 82 - from Main Ave SE to US 10

CR 82, from Main Ave SE to US 10 is a fully urbanized roadway that the County owns however, it is not clear why the County still has jurisdictional ownership of the roadway.

Clay County should coordinate with the City of Moorhead about how to turnover ownership of the roadway to the City. This stretch is also part of the 20th/21st St grade separation project and it is unclear as to why jurisdictional turnover has not happened yet. Figuring out this turnover should be a priority for the County.

CSAH 12 - from Red River to 1 Mile east of CSAH 11

CSAH 12 is a paved 2-lane roadway with paved shoulders that runs across Clay County from the Red River (connects to 52nd Ave S in Fargo's urban area) on the west to Becker County on the east; however, between 1 mile east of CSAH 11 and CSAH 17, CSAH 12 is a gravel road. From the Red River to 1 mile east of CSAH 11, CSAH 12 accommodates multi-modal agricultural, freight, and passenger vehicle traffic and provides mobility across the entire County.

CSAH 12 has a bridge crossing of the Red River, west of which becomes 52nd Ave S in Fargo. Rapid growth in Fargo north and south of 52nd Ave S has increased traffic along CSAH 12 from the Red River to CSAH 11. CSAH 12 is also in close proximity to Moorhead's long-term growth area which means the roadway will likely see development pressure as time goes on.

Between the Red River and US 75, CSAH 12 is classified as a minor arterial; otherwise the roadway is classified as a collector.

- **Issues**
  - Because of the mobility CSAH 12 provides across the County and to and from the FM urban area, growing traffic volumes are contributing to multi-modal safety concerns.
  - There have been numerous minor crashes on CSAH 12 that have occurred between 2016 and 2020.

• Freight traffic may also continue to grow, especially as FM Diversion construction activities ramp up.

• Development pressure will continue to mount as Moorhead takes steps to develop the southerly growth area however, this should be considered a long-term possibility that may not occur within the planning horizon of this plan (2045).

► **Opportunities**

• As a minor arterial and collector roadway, Clay County should continue to strictly regulate driveway access spacing pursuant to the Development Code. The balance between access and mobility should lean more towards mobility on CSAH 12 even as development pressure mounts as it provides a critical east-west connection across the entire County and Red River bridge crossing.

• Safety improvements may be considered at other major intersections of CSAH 12, and other strategies may be implemented to address speeds along the corridor, and consider multi-modal safety and mobility including freight and agricultural equipment. Sightlines, signage, and stopping distances may be reassessed to proactively identify locations for safety improvements along CSAH 2.

• Field access management and rural intersection safety strategies should balance agricultural operations, safety, and mobility on this segment of CSAH 12.

• Given the close proximity to the FM urban area and wide paved shoulders on CSAH 12, the roadway is popular among bicyclists traveling to and from the FM urban area and rural Clay County. The County may consider strategies that enhance bicycle and pedestrian safety along the roadway, especially in future projects.

Clay County should continue to collaborate with the City of Moorhead on access management and any development that may occur near CSAH 12 in the long-term.

CR 96 - from CSAH 22 to CSAH 26

CR 96 runs near the City of Moorhead's short- to mid-term growth area north of CSAH 22 and west of US 75. CR 96 is classified as a local roadway and provides less mobility to and from popular destinations across Clay County.

Clay County should continue to regulate driveway access spacing pursuant to the Development Code. The balance between access and mobility may lean more towards access on CR 96 as development pressure may increase sooner here than other locations in the County.

Given the close proximity to the FM urban area, CR 96 is popular among bicyclists traveling to and from the FM urban area and rural Clay County. The County may consider strategies that enhance bicycle and pedestrian safety along the roadway as there is currently no paved shoulder just north of CSAH 22.

The County should continue to collaborate with the City of Moorhead regarding access management and future development along CR 96.

CSAH 18 - from CSAH 3 to CSAH 11

CSAH 18, from CSAH 3 to CSAH 11, runs adjacent to the City of Moorhead and Dilworth's short- to mid-term growth areas. This segment of CSAH 18 is classified as a collector roadway and provides less mobility to and from popular destinations in the FM urban area.

Clay County should continue to regulate driveway access spacing pursuant to the Development Code. The balance between access and mobility may lean more towards access on CSAH 18 as development pressure is likely to increase sooner here than other locations in the County. The balance between access and mobility may be tricky for example, because CSAH 18 does provide strategic mobility from northern growth areas of Moorhead and Dilworth to CSAH 11/MN 336.

Safety also appears to be a concern, with three (3) severe crashes including one (1) fatality between 2016 and 2020. Multi-modal safety strategies should be strongly considered on this roadway.

Given the close proximity to the FM urban area and paved shoulders on CSAH 18, the roadway is popular among bicyclists traveling to and from the FM urban area and rural Clay County. The County may consider strategies that enhance bicycle and pedestrian safety along the roadway, especially in future projects.

The County should continue to collaborate with the City of Moorhead and Dilworth regarding access management and future development near CSAH 18.

Small Town Corridors

Similar to urbanizing corridors however, at a smaller scale and with rural or small town character preservation in mind. These critical corridors are those which run through incorporated areas of Clay County outside of the urbanized FM Area. Context sensitive solutions should be pursued with cooperation and collaboration from applicable small town jurisdictions when considering transportation projects in these places to help improve the health, safety, and welfare of rural communities in the County. Transportation projects through small communities of Clay County may need to respond to multi-modal users, efficiency and mobility, safety, land use, and economic development. Some of the smaller communities have identifiable downtown commercial districts, historical areas, and/or commercial or agricultural operations (i.e. grain elevator) that may be more susceptible to impacts of transportation projects.

Small town corridors are evaluated for a series of issues focusing most specifically those aforementioned considerations listed in the paragraph above. This analysis provides additional basic considerations for projects on County-owned roadways in small town jurisdictions.

CSAH 34 Georgetown

- Freight (elevator)
- Agriculture
- Access Management

CSAH 34 Felton

- Freight (elevator)
- Agriculture
- Access Management
- Speed (transition)
- Safety (MN 9 intersection)

CSAH 34 Ulen

- School Safety (Ulen-Hitterdal School District)
- Downtown Commercial District
- Freight (elevator)
- Access Management
- Agriculture
- Bike and Pedestrian Facilities
- Speed (transition into City limits)
- Safety (MN 32 intersection, at-grade railroad crossing, multi-modal considerations)

CSAH 26 Hitterdal

- Freight (elevator)
- Agriculture
- Access Management
- Bike and Pedestrian Facilities (State priority route shown on CSAH 26)
- Speed (transition into City limits)
- Safety (MN 32 intersection, at-grade railroad crossing, multi-modal considerations)

CSAH 31 Hawley

- Freight (commercial/industrial land uses)
- Access Management
- Speed (transition into City limits)
- Safety (multi-modal considerations)

CSAH 33 Hawley

- Clay County recently completed a project here in collaboration with the City of Hawley to add some context sensitive design considerations in the City's downtown commercial district.

CSAH 52 Barnesville

- Downtown Commercial District
- Freight (commercial/industrial land uses)
- Access Management
- Agriculture
- Bike and Pedestrian Facilities
- Speed (transition into City limits)
- Safety (skewed intersections, MN 9 intersection, multi-modal considerations)

CSAH 2 Barnesville

- Freight (commercial/industrial land uses)
- Access Management
- Agriculture
- Bike and Pedestrian Facilities
- Speed (transition into City limits)
- Safety (multi-modal considerations)

CSAH 2 Comstock

- Freight (elevator)
- Access Management
- Agriculture
- Bike and Pedestrian Facilities
- Speed (transition into City limits)
- Safety (At-grade railroad crossing, multi-modal considerations)

CSAH 52 Sabin

- Downtown Commercial District
- Freight (elevator, commercial/industrial land uses)
- Access Management
- Agriculture
- Bike and Pedestrian Facilities
- Speed (transition into City limits)
- Safety (multi-modal considerations)

The list of roadways identified in the corridor management strategies section is not exhaustive however, these are roadways Clay County should continue to closely monitor over time to ensure successful operations and maintenance of a high quality transportation system, and preserve the County's rural character.

CSAH 11 Sabin

- Downtown Commercial District
- Freight (elevator, commercial/industrial land uses)
- Access Management
- Agriculture
- Bike and Pedestrian Facilities
- Speed (transition into City limits)
- Safety (at-grade railroad crossing)

Future Arterial Bridge Crossing (80th Ave S/CR 67)

As Clay County and the FM Area have grown, numerous studies and discussions about a future bridge over the Red River south of I-94 have occurred.

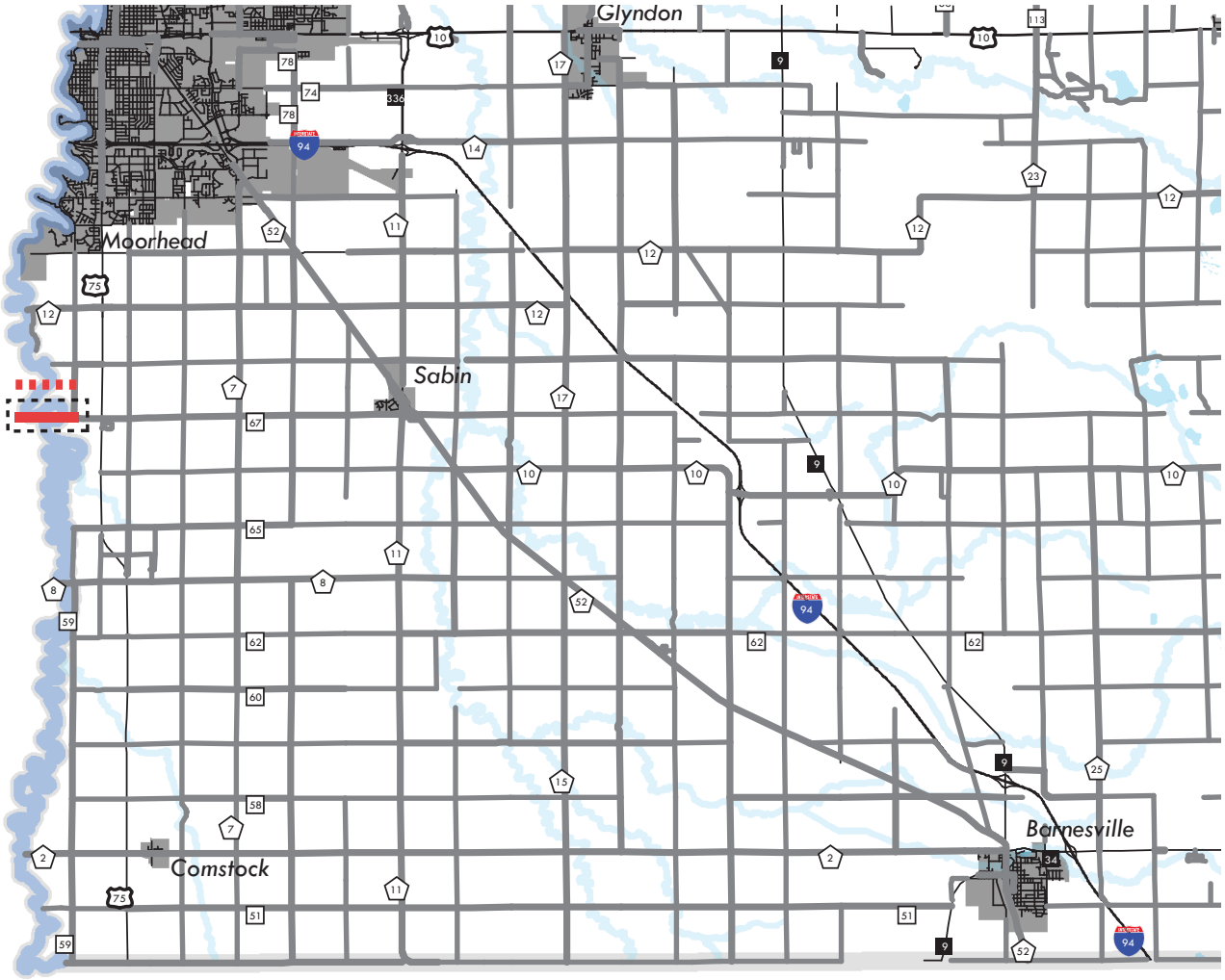


Figure 5.13 - Future Arterial Bridge Alignment

Recommended Locations (Various Planning Studies)

South Side Red River Bridge and Corridor Study (2001)
Priority
Alt. Priority

Metro 2040: Mobility for the Future (MTP, 2014)
New Bridge
Alt. Location

Metro Grow (MTP, 2019)
Preserve ROW

76th Ave S Corridor Study (2020)
Preserve ROW

Source: Clay County (2021)
86 CR
75 US Hwy
52 CSAH
Interstate
34 MN Hwy

N

CLAY COUNTY COMPREHENSIVE PLAN

The future bridge crossing would carry an arterial roadway that would enhance mobility not only to Clay County, but the region as a whole. Discussions on the future bridge alignments date back decades but are critical to plan for in the region given the natural occurring conditions of the Red River including but not limited to flooding, soil properties, and rapid growth which have impeded the process.

Currently, Clay County has a bridge on CSAH 12, a minor arterial, 3-miles south of I-94, and the nearest Red River bridge crossing for many residents of Moorhead living in the southern growth area of the City. Further south, Clay County has a bridge on CSAH 8, a major collector, 5-miles south of CSAH 12. Clay County has been involved in numerous discussions about a future arterial bridge to increase mobility across the region, especially between I-94 and I-29.

Clay County's preferred alignment for a new arterial bridge crossing is 80th Ave S/ CR 67, 2-miles south of the CSAH 12 bridge and 3-miles north of the CSAH 8 bridge. Strategically, an 80th Ave S bridge would greatly increase mobility to and from Sabin, CSAH 52, and is 1-mile north of the CSAH 10 interchange with I-94. West of the Red River, 80th Ave S aligns with 76th Ave S, a future arterial roadway that is also expected to have an interchange with I-29 and is conceptually planned to cross the Red River Diversion Channel.

Figure 5.13 shows proposed alignments from previous planning efforts for a future arterial bridge crossing and the priority location from Clay County's perspective. Property acquisition and right-of-way preservation should occur in the short-term by utilizing strategies outlined in the right-of-way acquisition strategies of this chapter. Coordination should occur through Metro COG's Metropolitan Planning process to drive the planning, design, and programming of this important project. Clay County should prioritize right-of-way preservation in advance of anticipated development and plan future development accordingly.

Freight

Historically, the County's economy has been tied to trade. In the 1870s, the Northern Pacific Railway began laying track across Clay County connecting the area to Duluth, MN on the east and Puget Sound, WA on the west. Today the county is served by an extensive multi-modal freight network that supports the local and national economy. In terms of employment, freight-related industries (agriculture, manufacturing, wholesale trade, transportation, warehousing, and utilities) provide over 18 percent of jobs in Clay County.

Trucking

Commercial trucking is a primary mode of transportation for the movement of goods within and through the County. Clay County highways are designated trucking routes, designed, and constructed to accommodate and support the transport of freight by truck.

- Freight Generators
  - Taracon Precast
  - American Crystal Sugar (multiple sites)
  - Elevators/Grain Elevators
  - Aggregate Mines (sand/gravel pits)
  - Manufacturing
  - Transportation
  - Warehousing
  - Wholesale Trade
  - Waste Management

Figure 5.14 was created by utilizing Clay County tax parcel information and may not reflect existing or future freight generators. For example, Taracon Precast tax owner has multiple parcels across Clay County, but the freight generating operation is located as indicated on the map. Related tax owner parcels are included in the map for informational purposes, as these may be places where expansion of freight generating operations could occur.

Similarly, sand and gravel pits and sand and gravel pit potential may not be representative of the exact location of existing freight generation however, provide a general idea of where operations and future operations of sand and gravel pits, and related activity could generate freight traffic.

Agricultural Goods

The movement of agricultural goods across Clay County roadways is another very important consideration of the transportation plan. This includes both trucks and other farm implements such as tractors and implements pulled by tractors including plows, cultivators, etc.

The County should continue to develop strategies to accommodate the movement of agricultural goods throughout Clay County to not only support the economic back-bone of the region but to enhance safety on County roadways for multi-modal traffic including agricultural related equipment.

Freight improvement strategies may include:

- Paving critical County roadways along agricultural movement routes
- Improving intersections to enhance safety, sight lines, etc.
- Consider paving wider shoulders where possible to accommodate trucks, farm implements, and provide the ability for other vehicles to safely pass slower moving equipment.

Weight Restrictions

Clay County enacts weight restrictions during the Spring, when roadways in the area are most susceptible to damage. There are two frost zones in Clay County as defined by MnDOT which have slightly different load restriction timeframes which vary by year. The weight restriction timeframes from 2021 include:

- North-Central Zone (north of US 10)
  - Start Date - Monday, March 8, 2021 at 12:01 AM
  - End Date - Monday, May 3, 2021 at

BNSF Railroad Terminus in Ulen

12:01 AM

- Central Zone (south of US 10)
  - Start Date - Friday, March 5, 2021 at 12:01 AM
  - End Date - Monday, April 12, 2021 at 12:01 AM

The majority of Clay County roadways have weight restrictions between 7 and 10 tons. There are a few County Roadways with 5 ton weight restriction:

- All gravel roads
- County Road (CR) 100 between CR 102 and the north city limits of Georgetown
- CSAH 19 between CSAH 26 and the south limits of unincorporated Averill

Roadways without restrictions serve as primary thoroughfares through the county. Examples are I-94, TH 10, TH 75, MN 9, and MN 32. Figure 5.15 shows seasonal weight restrictions and frost zones in Clay County.

Railroads

Railroads are a significant element in America's transportation system, moving freight to and between ports, agricultural areas, and urban areas. Railroads have a significant impact on land use, the physical and social environment, and other components of the transportation system. Figure 5.11 shows the location of the two railroads that operate in Clay County, which are Burlington Northern Santa Fe (BNSF) and Ottertail Valley Railroad (OTVR). Clay County is in close proximity to other railroad facilities in Fargo and West Fargo on the BNSF and Red River Valley and Western Railroad. These facilities connect Clay County and the Fargo-Moorhead Area with national and international markets.

Freight Facilities

Intermodal freight facilities are locations where bulk commodities are transferred from rail to other modes of transportation. BNSF operates a regional freight intermodal facility at the Dilworth Rail Yard. Approximately 120 trains pass along tracks adjacent to the facility each day. The facility is located on a seven acre parcel and up until 2008, container lifts were performed on-site.

Recent information suggests this facility continues to be marketed as an intermodal facility; however, containers are trucked to the St. Paul terminal where they are loaded on trains. In effect, the Dilworth facility is not being utilized as a transfer facility or true intermodal yard. In order for the facility to be successful, according to BNSF, it must provide the following: (a) traffic

Agricultural Operations in Hawley Township

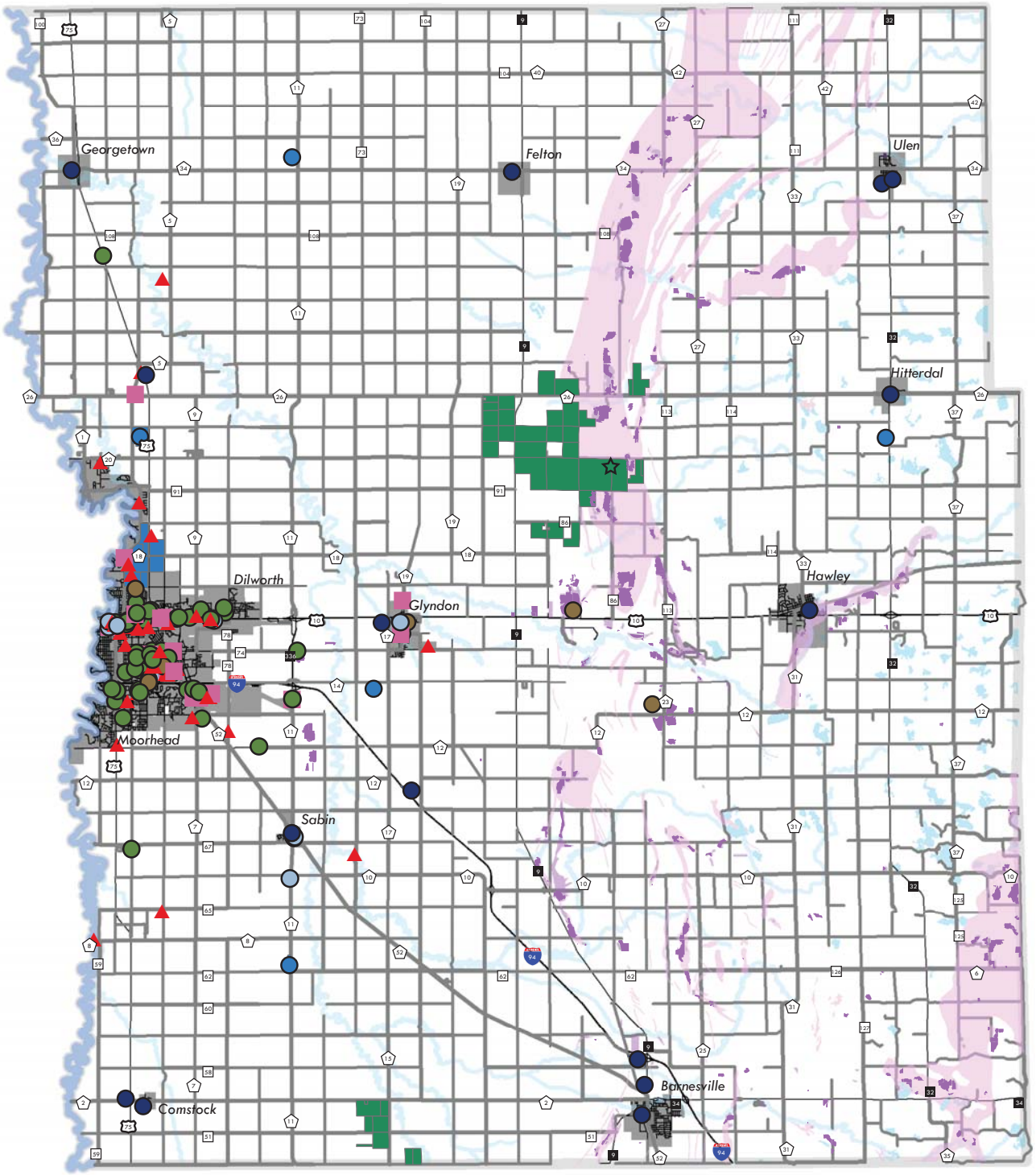


Figure 5.14 - Freight Generators

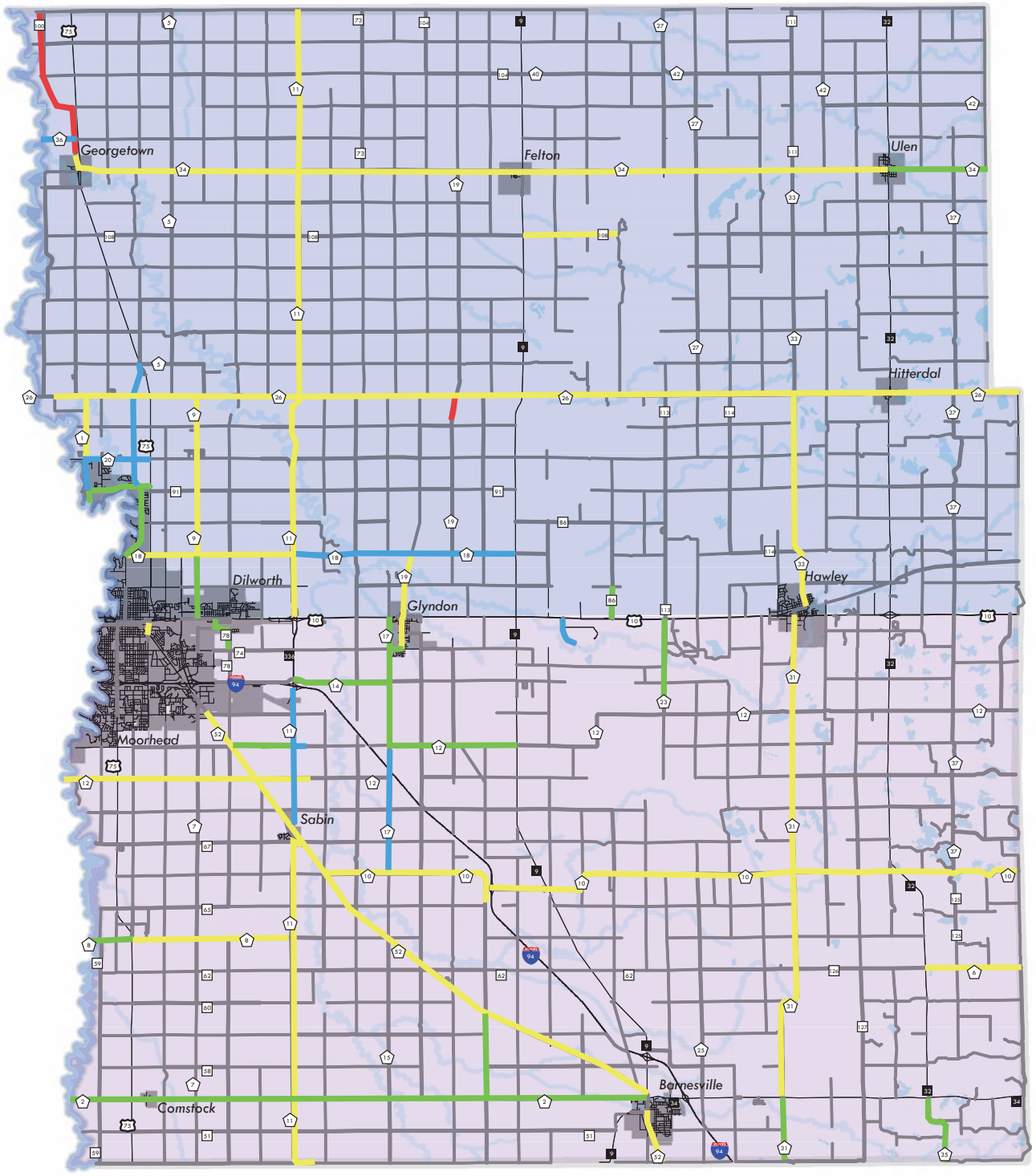
Source: Clay County (2021)

Corridor Typologies

- Taracon Precast (Tax Owner)
- Taracon Precast Operations
- Elevator/Co-op (Tax Owner)
- American Crystal Sugar
- Sand/Gravel Pit
- Manufacturing
- Transportation
- Sand/Gravel Potential
- Warehousing
- Wholesale Trade
- Waste MGMT

N

CLAY COUNTY COMPREHENSIVE PLAN



*CSAH 1 between CSAH 20 and CSAH 26 is currently a 5 ton roadway however, there is a project in the Clay County CIP to reconstruct the roadway to a 10 ton roadway in 2023.

Figure 5.15 - Weight Restricted Roadways

Rating

10 Ton
9 Ton
7 Ton
5 Ton
North Central Frost Zone
Central Frost Zone

Source: Clay County (2021)

86 CR
75 US Hwy
52 CSAH
94 Interstate
34 MN Hwy

N

CLAY COUNTY COMPREHENSIVE PLAN

volume large enough to generate efficient shipment sizes to final destinations without being consolidated with other intermodal freight, (b) must have ancillary services available to the railroad that would give it a reason to stop and receive extra cars, (c) service to a market area that does not overlap with an existing intermodal facility, (d) weekly minimum volumes that allow trainload volumes and economic efficiencies, (e) in-bound/out-bound balance, and (f) sustainable growth forecasts over a long term planning horizon. Metro COG's Metropolitan Transportation Plan (MTP), Metro Grow, continues to support the development and identification of intermodal facilities for the Metropolitan Area.

Although the Dilworth Rail Yard facility is not a true intermodal facility in the traditional sense, it nonetheless still serves an important transportation function and is an influential employer in Clay County.

FM Diversion and Freight Impacts

The FM Area Diversion is currently being constructed to provide permanent flood protection to over 235,000 FM Area residents. The project is being constructed jointly by the U.S. Army Corps of Engineers and the Metro Flood Diversion Authority and includes 19 new bridges, 30 miles of diversion channel, and 20 miles of southern embankment. As shown in Figure 5.16, there are also numerous structures associated with the operation of the diversion channel. Resources to construct the diversion and related structures may come from local and regional sources, likely traveling across Clay County Roadways, increasing freight traffic volumes region wide.

The diversion will not only have a large economic impact by creating jobs (estimated to be 7,000 full-time equivalent jobs over the six-year construction timeline) and permanent flood protection but there will also be major impacts to the transportation system during the project's construction. Construction of the project is anticipated to take six years from 2021 to 2026 working north to south.

The natural geographic features of Clay County provide numerous aggregate resources. The County currently has aggregate mining operations including sand and gravel. The FM Diversion project is expected to cause higher demand for said resources including expansion of aggregate mining operations in existing and new locations across Clay County.

Freight traffic is expected to increase to and from aggregate operations including concrete batch plants and other related facilities.

Clay County should work with partner agencies including local jurisdictions, the State of MN, and Metro COG to monitor where freight traffic is occurring and prepare for increased maintenance of roadways along high-traffic freight routes. Aside from principal arterials and interstates owned by the State, it is likely some percentage of freight movement related to the diversion will occur across Clay County owned roadways and certainly from Clay County owned roadways to State owned roadways. In the short-term, construction will start on the southern embankment and associated structures, while the diversion channel itself will begin construction on the north end of the project area and move southward over

the next six years. The largest structures related to the FM Diversion project are located along the Southern Embankment and includes the Red River Control Structure, Wild Rice River Control Structure, and Diversion Channel Inlet Control Structure.

Freight traffic on County roadways may be funneled to CSAH 2 or CSAH 8 to cross the Red River. CSAH 12 could also see freight traffic however, it is further from the Southern Embankment structures than CSAH 2 and CSAH 8.

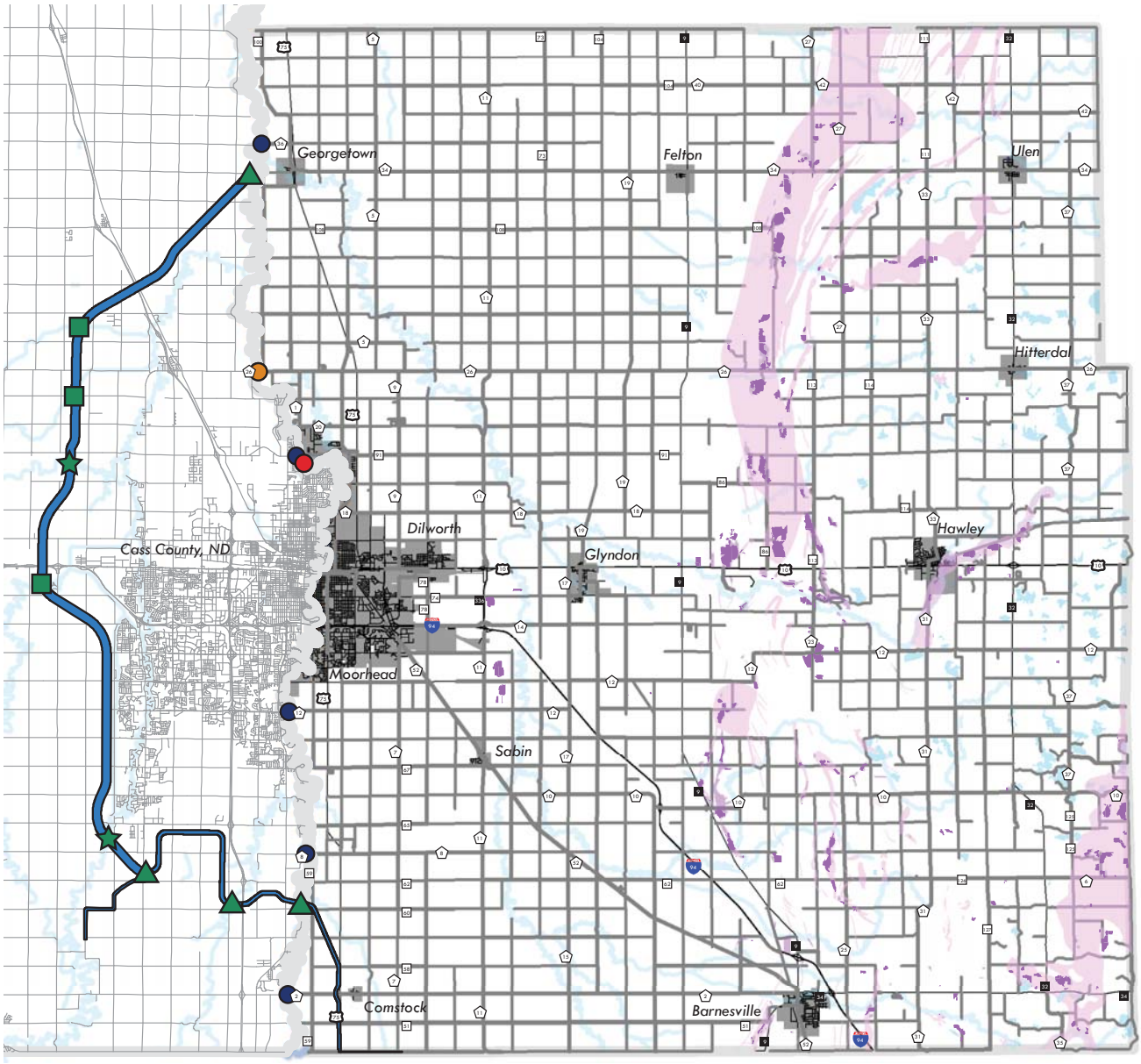


Figure 5.16 - FM Diversion and Infrastructure

CLAY COUNTY
COMPREHENSIVE PLAN

On the northern end of the project, freight traffic across County roadways may have to filter through CSAH 36 which is load posted, CSAH 26, or CSAH 22 to cross the Red River. CSAH 36 has a bridge sufficiency rating of 40 and is posted with load limits however, the bridge is not currently in the programmed or 2021 to 2025 construction program. Clay County will need to monitor any freight traffic crossing the bridge and may need to prioritize a rehabilitation or reconstruction project as soon as funding becomes available.

As construction ramps up on the FM Diversion project, Clay County should be aware of where freight is likely to travel on the County system and monitor infrastructure conditions closely. As more information is released about the FM Diversion construction process and timeline, Clay County will be updated on when and where major construction will be taking place to better prepare for impacts to roadways and bridges.

Pipelines

Given Clay County's geographical location and relative proximity to oil producing regions of North Dakota and Canada, there are a few existing pipelines that run through the County with potential for expansion based on need. Pipelines, although controversial provide one of the most efficient and safe modes to move petroleum and other petroleum products from production areas to refineries.

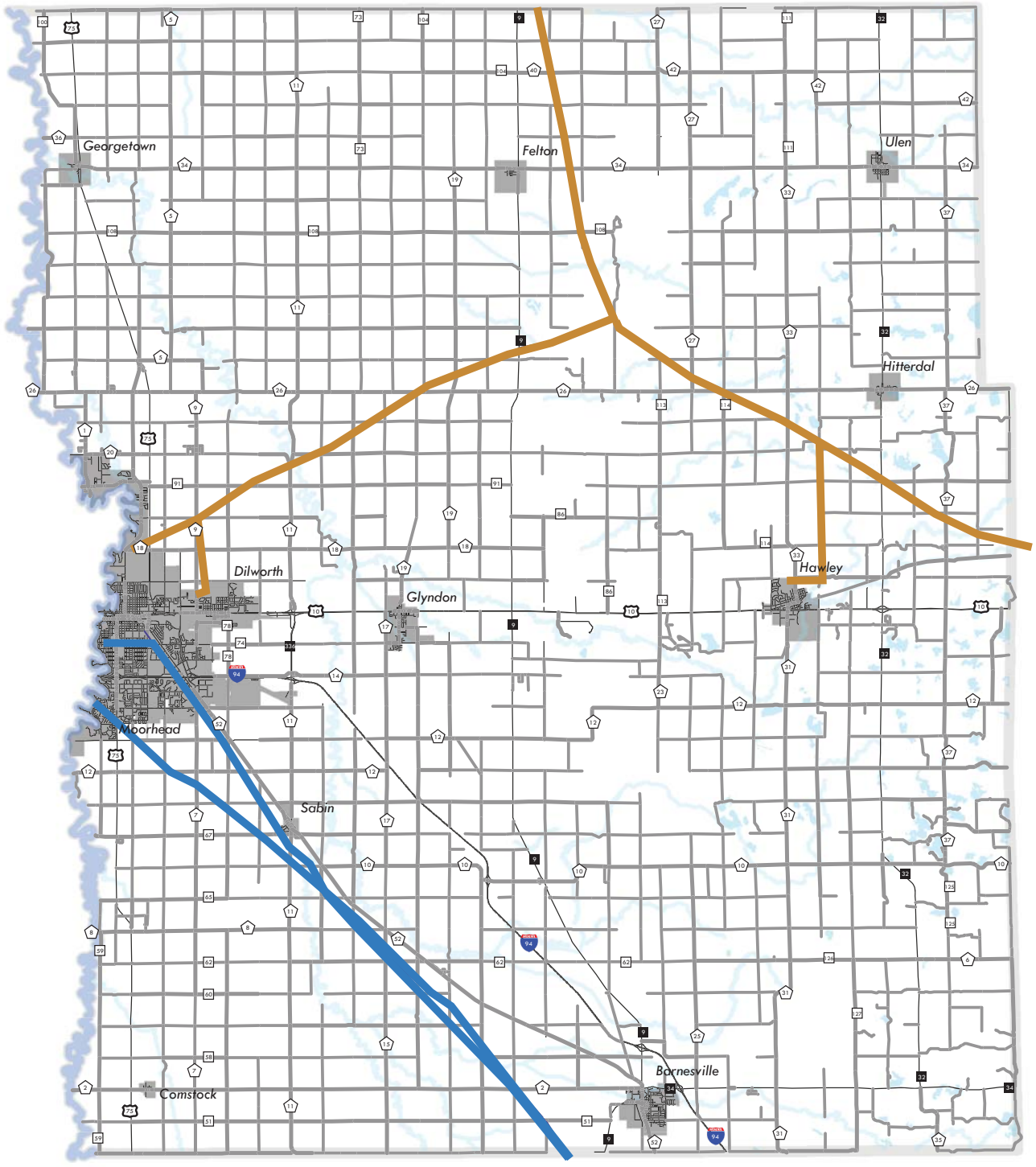
Transit

Meeting the transportation needs of Clay County residents requires a complete transportation system incorporating a variety of transportation modes. Affordable and convenient transit is an essential characteristic of urban and suburban communities. The growing demand and opportunity for convenient and reliable transit service is fueled not only by the aging of the County's population but also by its increasing diversity, growth, and densification. Providing convenient, reliable, and robust transit service can play a vital role in supporting mobility, access, and economic development.

Fixed Route

MATBUS provides fixed-route service within the Cities of Moorhead and Dilworth in Clay County. In Moorhead and Dilworth, fixed-route service is available through seven routes from Monday to Friday from approximately 6:15 a.m. to 11:15 p.m. and 7:15 a.m. to 11:15 p.m. on Saturday. MATBUS does not provide service on Sundays however, Sunday service was a high priority goal of the 2021-2025 Transit Development Plan.

The basic adult fare is $1.50 per trip, though discounts are available based on age or disabled status. Discounted unlimited ride passes are also available. Transfers are free. College students enrolled at Concordia College, Minnesota State University Moorhead (MSUM), and Minnesota State Community and Technical College (M | State) pay for service through student fees as part of the U-Pass program.



CLAY COUNTY
COMPREHENSIVE PLAN

Figure 5.17 - Pipelines

Pipelines
- Natural Gas Pipeline
- Petroleum Product Pipeline

Source: US Energy Information Administration (2016)

86 CR
75 US Hwy
52 CSAH
94 Interstate
34 MN Hwy

N

Paratransit

MATBUS also offers door-to-door paratransit service to complement fixed-route service. MAT Paratransit operates in accordance with the Americans with Disabilities Act (ADA) for people with disabilities who have obtained a Special User Card from the City Transit Offices of Fargo or Moorhead. The ADA requires that all areas within three-quarters of a mile from fixed routes receive demand-response service. MAT Paratransit exceeds the minimum service area standards by offering service everywhere within the city limits of Fargo, West Fargo, Moorhead, and Dilworth. MAT Paratransit operates as a shared ride service so vehicles often pick up multiple passengers traveling to different destinations at the same time.

The cost of each ride is $3.00 per passenger, though personal attendants and children under the age of seven can ride for free if accompanying an eligible passenger. Service is available from Monday to Friday from 6:15 a.m. to 11:15 p.m., 7:15 a.m. to 11:15 p.m. on Saturday, and 7:00 a.m. to 5:00 p.m. on Sunday.

Rural Transit

Productive Alternatives

Productive Alternatives is a nonprofit human services organization whose Transportation Alternatives program provides transit service from rural Clay County to various destinations in Moorhead, the Ground Transportation Center in Fargo, and Walmart in Dilworth. The service operates wheel-chair accessible vehicles. The demand response system requests reservations be made 48-hours in advance of the trip.

Transit Alternatives provides service between the Fargo-Moorhead metropolitan area and Fergus Falls via I-94 on a daily basis, Monday through Friday, leaving Fergus Falls at 5:45 AM and arriving in Fargo-Moorhead just before 7:00 AM. Passengers are then served by the MATBUS system until the return vehicle leaves just after 5:00 PM. This route was suspended during the ongoing COVID-19 health crisis.

Transit Alternatives also provides service between the FM Area and Detroit Lakes via US 10 on a daily basis, Monday through

Transit Vehicle for The Otter Express

Friday, leaving Detroit Lakes at 6:00 AM and arriving in Fargo-Moorhead just after 7:00 AM. Passengers are then served by the MATBUS system until the return vehicle leaves just before 5:00 PM. The route was suspended during the ongoing COVID-19 health crisis.

Region 4 Rural Transportation Coordinating Council (R4RTCC)

The Regional Transportation Coordinating Council (RTCC) in MnDOT District 4 is a relatively new program from the Departments of Transportation and Department of Human Services.

The aforementioned state departments are working with local governments and organizations to create RTCCs as appropriate throughout Greater Minnesota. Coordination between transportation providers, service agents, and the private sector is a goal to fill transportation gaps, streamline access to transportation and provide individuals more options of where and when to travel. The State of Minnesota provides Federal funding for eligible RTCCs.

- ► What is a Rural Transportation Coordinating Council?
  - RTCCs consist of stakeholders interested in improving mobility for "transportation disadvantaged" people such as: older adults, individuals with disabilities, individuals with low incomes, and/or military veterans. The RTCC for District 4, which includes Clay County is West Central Minnesota Communities Action, Inc. (WCMCA).

- ► West Central Minnesota Communities Action
  - West Central Minnesota Communities Action, Inc. (WCMCA) is located in Elbow Lake, MN and has been in existence since 1965, serving low income households primarily in Douglas, Grant, Pope, Stevens, and Traverse counties in West Central Minnesota. In the fall of 2017, MnDOT solicited RFPs for RTCC Organizational grants and WCMCA was awarded the RTCC grant in the summer of 2018. WCMCA's implementation of the Ready Ride Senior Transportation Program through the Live Well at Home Grant provided a solid foundation for building the Region 4 Rural Transportation Coordinating Council (R4RTCC). The RTCC organizational development plan is to serve all nine counties within the Region 4 planning area. WCMCA has an RTCC board which includes representatives from Region 4's social services departments, Area Agencies on Aging, Workforce Development, transportation providers, human service agencies, veteran's organizations, Continuum of Care Coordinators, Independent Living facilities, and public and private funders of transportation. The primary role of the RTCC is to provide mobility management services which promote transportation services to members and eligible citizens of the Region 4 area, including residents of Clay County.

Driving Program for Older Adults

The Rural Enrichment And Counseling Headquarters (REACH) is a multi-agency human service center serving primarily individuals and families in rural Clay, Becker, and Norman Counties in Minnesota. Their office is located in Hawley, MN

REACH's Driving Program for Older Adults can be used for medical appointments locally and in the Fargo-Moorhead or Detroit Lakes Areas. A suggested donation of $20 for each out-of-town trip and $5 for each in-town trip is encouraged and appreciated however, no rider will be denied due to inability to donate. The program is volunteer based and REACH does not guarantee a driver will be available for every ride request.

The rider eligibility requirements are as follows:

- 60 years of age and older
- Physically and mentally independent
- Lives in the Hawley, Hitterdal, Ulen, Felton, or Glyndon areas
- Must be pre-registered for the program to request a ride

Transit was brought up as a concern from Clay County residents in several public engagement events held during the development of the Comprehensive and Transportation Plan. Clay County should continue to monitor and provide resources accessible to residents about transit services that already exist across the County.

Park-and-Ride

Clay County has only one park-and-ride facility just east of Hawley on the north side of the MN Highway 32 and US Hwy 10 interchange. The facility is paved with 21 automobile parking spots and a parking lane for trucks. There is no transit service currently serving this park-and-ride facility.

Railroad Transit

Currently, one passenger train route services the Fargo-Moorhead Metropolitan area: the Empire Builder line which runs from Chicago, IL to Seattle, WA. There are no Empire Builder train stations located in Clay County, though there are stations in the nearby cities of Fargo, ND and Detroit Lakes, MN. The route offers nighttime public transit to Minneapolis-St. Paul, MN which draws in both urban and rural travelers from Clay County. Coach seats are priced around $40 one way (as of January 2022).

In the coming years, new passenger railway lines may be added as groups such as All Aboard Minnesota and the Greater Northwest Working Group advocate for new passenger railroad connections throughout Minnesota and the Northwest, including the Fargo-Moorhead region and Clay County. Proposed destinations for the new passenger rail routes include Bismarck, ND; Sioux Falls, SD; Winnipeg, MB, CA; and Des Moines, IA. The Greater Northwest Working Group is proposing a route from Fargo-Moorhead to Seattle, WA through Bismarck, ND; Billings, MT; and Helena, MT. This proposed rail line is similar to the North Coast Hiawatha Amtrak route which operated from 1971 until 1978. All Aboard Minnesota is proposing this route as well as several other routes throughout Minnesota and a daytime rail service from Fargo to Minneapolis.

Clay County should pay close attention to the efforts as these proposed passenger rail routes could provide new and efficient transit service to several popular destinations for Clay County residents and could bring more people to Clay County and the Fargo-Moorhead area while maintaining the rural character of Clay County.

Bicycle and Pedestrian Network

Pedestrian and bicyclists share the transportation system with motorists. Many rural destinations in Clay County are on the County highway system, including but not limited to commercial areas, schools, employment centers, parks, open spaces, and natural areas. The County highway system is in many cases the only option for pedestrians and bicyclists. Some rural communities of Clay County lack a connected road and sidewalk network that would allow pedestrians and bicyclists to travel off the County system, making the County highway system the only choice. This is also the case for pedestrians and bicyclists traveling outside of the urban FM area. Pedestrians and bicyclists frequently interact with vehicle traffic on County highways when not only traveling along, but also when crossing these corridors. As bicycling and walking become more and more popular across Clay County, multi-modal safety may also grow in priority, especially along critical bicycle and pedestrian routes within rural communities. Bicycle and pedestrian facilities are an important element of a safe and efficient transportation system to serve all modes and users. Basic provision and improvement needs include continuous facilities that allow for safe and convenient use. Bicycling and pedestrian transportation planning provides multiple benefits to the County including environmental sustainability, safe routes for users, active living and improved health, improved transportation options, quality of life, and safety.

MnDOT District 4 Bicycle Plan

MnDOT completed a *Statewide Bicycle System Plan* (SBSP) in 2016 which includes goals, strategies, and actions for bicycling in Minnesota. One of the SBSP's goals is to develop a connected network of state bicycle routes with partners across the state. The SBSP identifies corridors for a state priority bicycle network. The *District 4 Bicycle Plan* builds on the SBSP by identifying specific Bicycle Investment

State Highway 32 near Rollag in Parke Township

Routes within the state priority bicycle network. Bicycle Investment Routes are planning tools that should guide future investments in bicycle facilities across the district and are not intended to be used as navigational tools. The District 4 bicycle planning process builds on the work from the SBSP and includes five major components:

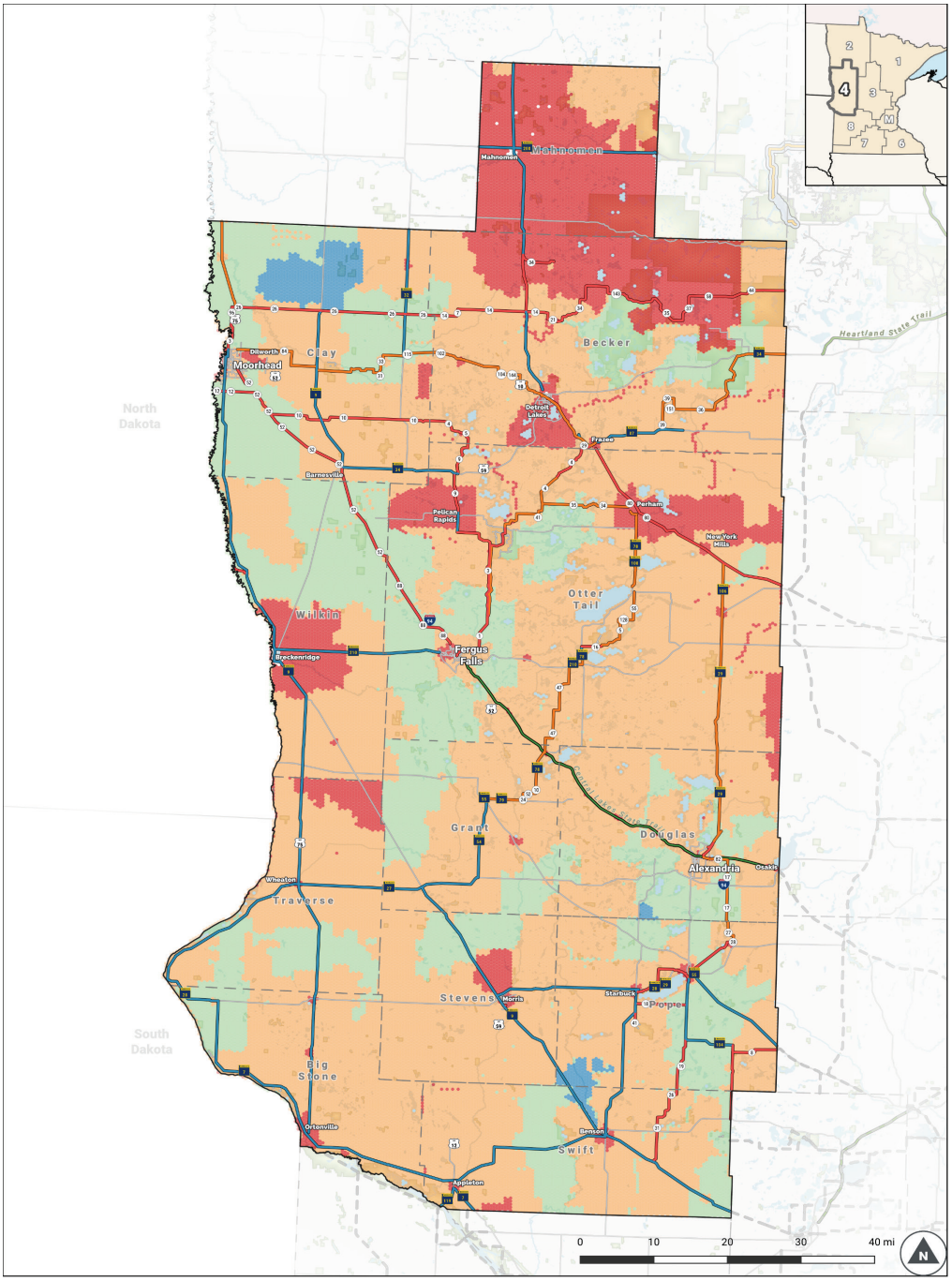
- ► 1. Identifying state bicycle route network priority corridors (completed in the SBSP)
  - • High Priority - Detroit Lakes to Moorhead
  - • Low Priority - Fergus Falls to Moorhead, Wahpeton to Moorhead, and Moorhead to East Grand Forks.
- ► 2. Identifying district regional priority corridors (completed in the SBSP)
- ► 3. Analyzing bicycling suitability on all roadways across the state
- ► 4. Identifying Bicycle Investment Routes
- ► 5. Developing a prioritization framework to help MnDOT prioritize bicycle investments

Clay County should continue to support bicycle mobility across the County. Paving shoulders wider than 4-feet may increase mobility and safety in numerous ways including but not limited to: wider paved shoulders provide more space for bicyclists and agricultural equipment alike, highlighting the importance of providing multi-modal transportation infrastructure.

The State Bicycle Route Network is defined in the SBSP as a network of envisioned connections that link destinations throughout the state by bicycle. The SBSP priority corridors reflect public preferences expressed during SBSP outreach, the potential for connectivity to the U.S. Bicycle Route System (USBRS), potential connectivity to other bicycle route corridors, potential for designation as a U.S. Bicycle Route, and continuity across the state. The connections are presented in the SBSP as corridors between two points which are 10-miles wide instead of specific route alignments. Identifying more refined route alignments in coordination with local stakeholders for the SBSP corridors was a primary objective of the district bicycle planning process. Said corridors identified through the *District 4 Bicycle Plan* are referred to as "Bicycle Investment Routes."

Bicycle Investment Routes

Bicycle Investment Routes were identified through a bicycle planning process that included a bicycling suitability analysis of all roadways in Minnesota. A bicycle suitability analysis uses measurable attributes of the roadway to approximate how it may accommodate people traveling by bicycle. The SBSP found a strong preference from bicyclists for low-stress environments (e.g. low traffic speeds and/or traffic volumes). With this being said, the District 4 Bicycle Plan only recognizes low-stress roadways and shared use paths as preferred bicycling options.



DEPARTMENT OF TRANSPORTATION TOOLE DESIGN

Figure 5.18 - Bicycle Investment Routes and Prioritization

This map comes directly from the *District 4 Bicycle Plan.*

Source: MnDOT (2019)

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CLAY COUNTY COMPREHENSIVE PLAN

Utilizing the bicycling suitability analysis, Bicycle Investment Routes were identified within the priority corridors of the SBSP. The Bicycle Investment Routes are planning tools that will guide future investments in bicycle facilities across Clay County and are not designated bicycle routes to be used for current bicycle navigation. The Bicycle Investment Routes will guide MnDOT's investments on the state highway network in Clay County.

Another important consideration of the *District 4 Bicycle Plan* is to support local and regional bicycling networks. During the SBSP planning process, participants prioritized investments that supported local travel two to three times more important than investments for statewide bicycle travel. Many of the Bicycle Investment Routes on state highways may serve local trip purposes when connecting to other or planned local bicycle routes therefore, it is important for Clay County to remain an active partner in the statewide bicycle planning process.

Prioritization

The Bicycle Investment Route prioritization framework evaluates each Bicycle Investment Route based upon several scoring criteria including the following categories:

- Local Connections
- Population and Equity
- Activity Generators
- Network
- Plan Consistency
- Safety

Based upon said categories, scores were assigned to various areas across Minnesota and a prioritization visualization was created. The prioritization scores were sorted into five tiers; red hues represent areas with the highest prioritization scoring results, and the blue and green hues represent areas with the lowest prioritization scoring results.

Clay County should utilize the *District 4 Bicycle Plan* to help prioritize local connections to the statewide and regional network of planned bicycle facilities.

United State Bike Route 20 (USBR 20)

The U.S. Bicycle Route System (USBRS) is developing a national network of bicycle routes connecting urban and rural communities via signed roads and trails. Created with public input, U.S. Bicycle Routes direct bicyclists to a preferred route through a city, county, or state; creating safer opportunities for people everywhere, including portions of rural Clay County, to bicycle for travel, transportation, and recreation.

Nearly 18,000 miles are currently established in 31 states and Washington, D.C. and many routes are signed.

There are two existing U.S. Bicycle Routes in Minnesota including:

- Designated in 2013, USBR 45 (Mississippi River Trail) which follows the Mississippi River from its headwaters in Itasca State Park, to the Iowa border.

- Designated in 2016, USBR 41 (North Star Bicycle Route) which runs from St. Paul, MN, to the Canadian Border.

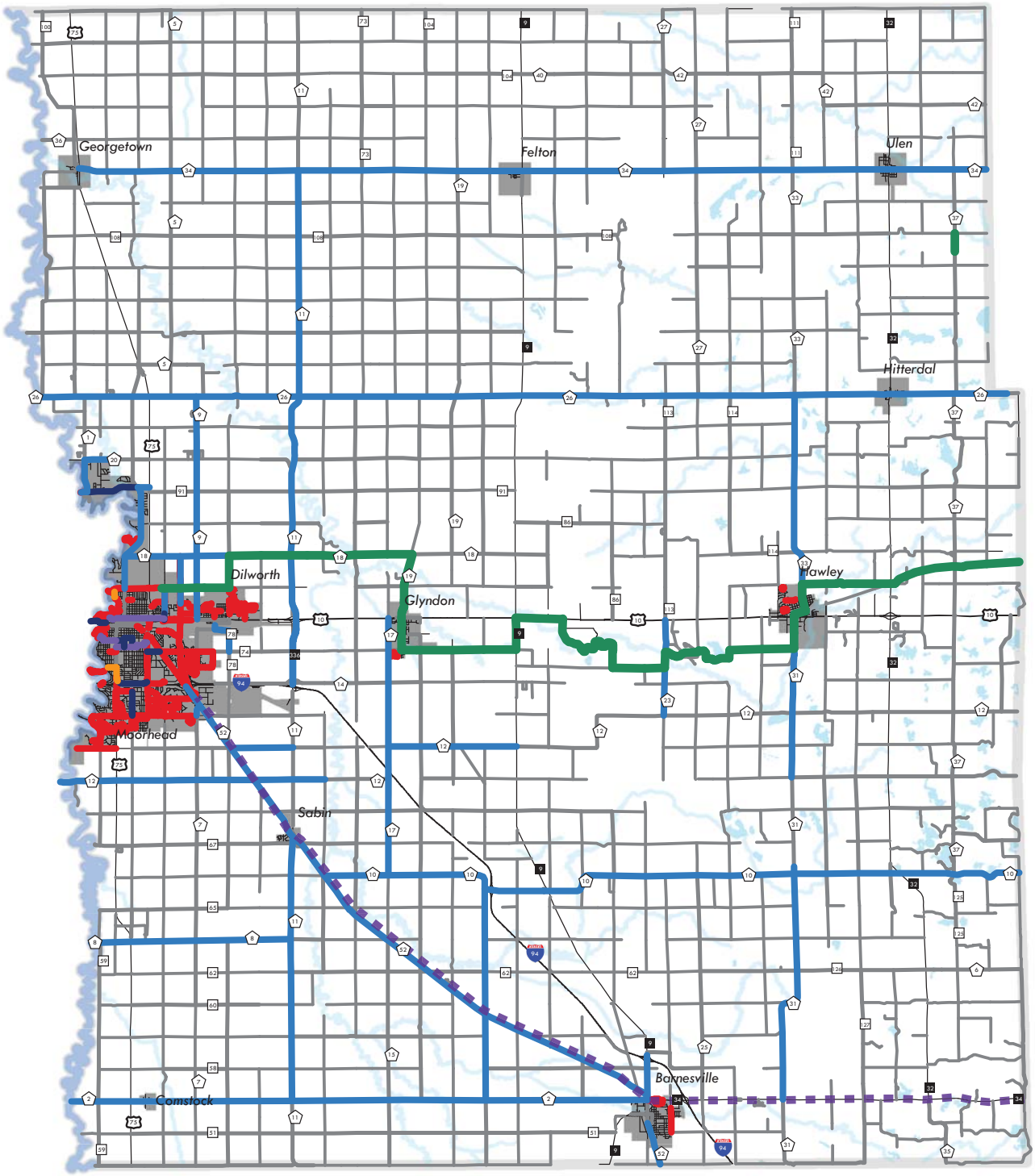

Figure 5.19 - Existing and Future Bike and Ped Network

Source: Metro COG (2021)

Bike/Ped Facility Type

- Future Heartland Trail
- Paved shoulder > 4'
- Shared Use Path
- Bike Lanes
- Sharrows
- Signed Only
- USBR 20 (Preliminary)

86 CR | 75 US Hwy | 52 CSAH | Interstate | 34 MN Hwy

N

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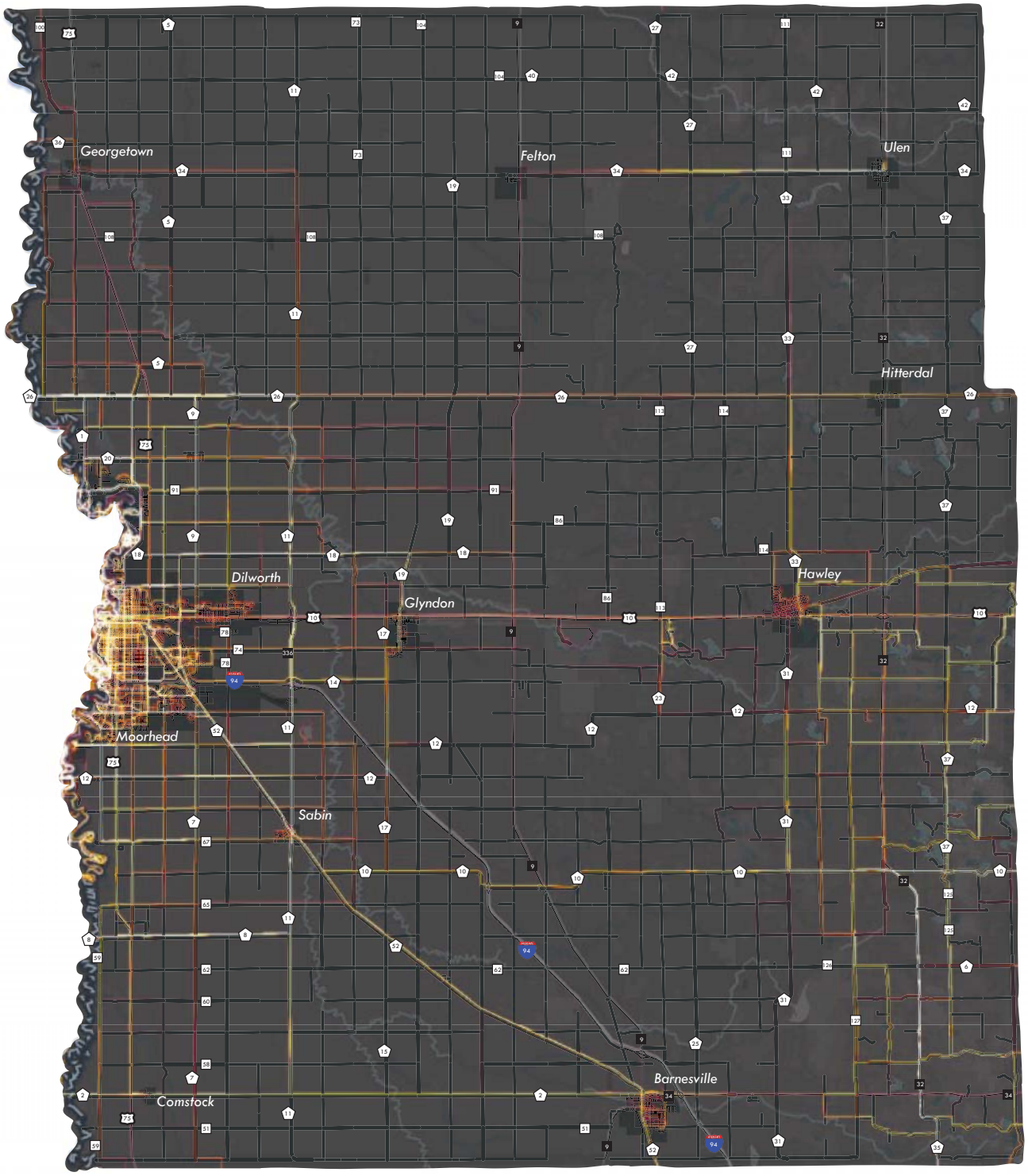


Figure 5.20 - Strava Heat Map

Bike Activity

Low — High

Source: Strava (2021)

86 CR
75 US Hwy
52 CSAH
94 Interstate
34 MN Hwy

N

CLAY COUNTY COMPREHENSIVE PLAN

U.S. Bicycle Route 20 (USBR 20) is the most recently proposed U.S. Bicycle Route, and would be the third in the State of Minnesota, connecting St. Cloud, MN to Moorhead, MN. The preliminary route through Clay County, would put USBR 20 on MN 34 and CSAH 52; it should be noted that this alignment has not yet been finalized. The route can be seen on Figure 5.19.

Clay County should continue to work with MnDOT to designate USBR 20 through the County and prioritize multi-modal improvements along MN 34 and CSAH 52.

Pedestrian Travel

To better develop opportunities for county residents to walk and bike for transportation and recreation, the County will need to work closely with local communities to improve conditions. The following should be considered when addressing pedestrian travel needs:

- Destinations - such as small towns, parks, schools, activity centers, natural areas, and trails.
- Networks - connections free of barriers such as railroads, busy roads, water bodies, hills, and isolated areas.
- Density - non-motorized transportation becomes less efficient in rural areas with less population densities.
- Safety - consider safety in infrastructure decisions.

Because of the rural character of Clay County, pedestrian needs are not as prevalent throughout a majority of the county. However, the County should consider shared use trails along County Highways where there may be high pedestrian and bicycle demand.

Also due to the rural character of Clay County, recreational and local pedestrian trips may be more likely so a pedestrian facility along the entire Clay County Highway system should not be prioritized but rather, the county should prioritize facilities that connect with local destinations or improve safety in areas with more pedestrian activity.

Non-Motorized Travel Along Highways

Bicyclists and pedestrians use different facilities based on ability and type of movement. There are three distinguishable types of bicycle riders based upon bicycling experience and comfort level: Type A, Type B, and Type C riders. Type A riders travel over 15 mph and should operate in travel lanes and shoulders to improve safety for all users. Type B riders have less experience and generally are recreational riders who operate safely on roadside trails. Type C riders are children, who are safest on the trail network. Similarly to Type C riders, pedestrians require well-maintained multiuse trails and safe road crossings. Shared use trails provide for bicycle travel in the urban FM area but are not as common in rural portions, or a majority of Clay County. Paved shoulders successfully support bicycling throughout Clay County and provide for popular routes among experienced and confident recreational bicyclists. Due to the nature of these on-street facilities, less experienced bicycle riders, pedestrians, and children may be considered less safe utilizing said on-street facilities. Figure 5.19 depicts the existing and planned bicycle network.

Strava Heat Map

Strava is a mobile internet application that provides people tracking for human exercise and incorporates social network features.

The application is used primarily for cycling and running using GPS data, to track activity.

Planning agencies such as Clay County and Metro COG may request access to anonymized Strava data which can help get a glimpse of activity of bicyclists and pedestrians across the County. By looking at Strava heat map data, it is clear to see that there are many popular routes across Clay County. The heat map in Figure 5.20 shows where the most activity is located in the County and where there may be gaps.

County roadways near the FM urban area have much more bicycle traffic according to the Strava heat map. Similarly, closer to the "lakes region" or southeast Clay County, there appears to be higher bike activity too. There appear to be other popular routes across rural or small town areas of the County including:

- CSAH 26 across the entire County
- CSAH 34 between Felton and Ulen
- CSAH 33 between Hawley and CSAH 26
- CSAH 31 between CSAH 10 and CSAH 12
- CSAH 52 from Moorhead to Wilkin County
- CSAH 10 from CSAH 52 to Becker County
- CSAH 2 from the Red River to Barnesville
- CSAH 17 between CSAH 12 and Glyndon

Heartland Trail

A State multi-use trail, the Heartland Trail, runs between Park Rapids and Cass Lake, going through Walker. The State Trail also provides a connection to another well known State trail, the Paul Bunyan Trail, which runs between Bemidji and Brainerd.

- Heartland State Trail
  - 50+ miles of paved multi-use trail
  - Planned extension of 90+ paved miles from Park Rapids to Moorhead
- Paul Bunyan State Trail
  - 123 miles of paved multi-use trail

Group Bicycle Ride in Rural Clay County

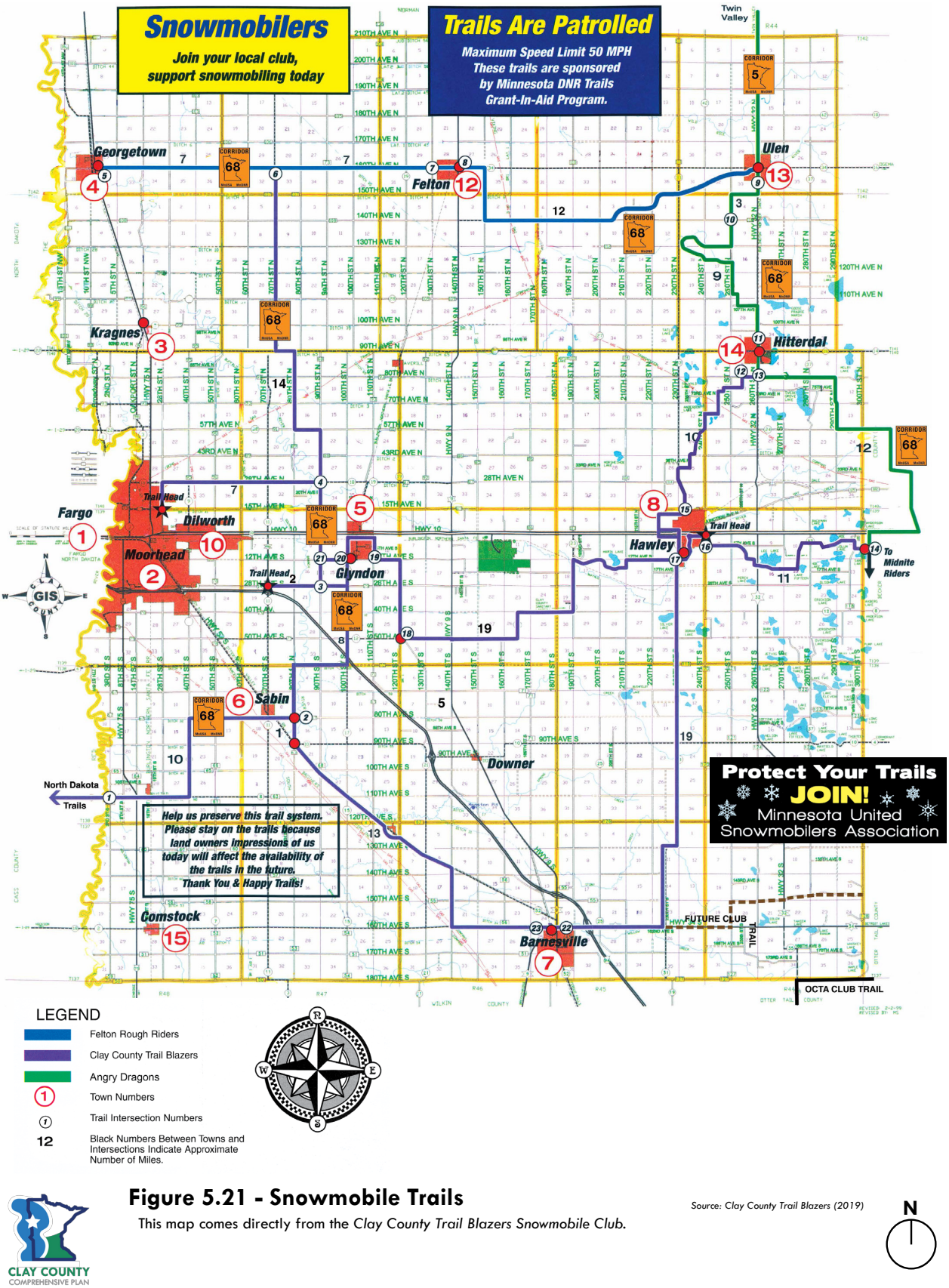


Figure 5.21 - Snowmobile Trails

This map comes directly from the *Clay County Trail Blazers Snowmobile Club.*

Source: Clay County Trail Blazers (2019)

CLAY COUNTY
COMPREHENSIVE PLAN

Heartland Trail Extension

In 2014 Metro COG helped initiate the Clay County Heartland Trail Task Force to help guide the planning of the Heartland Trail extension through Clay County. Since its inception, the Task Force has met regularly to discuss trail funding, issues, needs, and trail alignment options. The Task Force came up with three trail alignments which were brought to the public in January 2015. Two public involvement meetings were held in January 2015 and provided the public with an opportunity to learn about the project and provide feedback on the trail and trail alignments. The public was also given an opportunity to propose other alignment alternatives. After gathering the results of the public meetings, Alternative 2 was the most popular of the three alternatives. Several members of the public also provided trail alignment alternatives which were unique to the three alternatives developed by the Task Force.

It has been the consensus of the Clay County Heartland Trail Task Force to pursue the planning of the Clay County Heartland Trail in the following priorities:

- Priority 1 - Buffalo River State Park to Hawley
- Priority 2 - Moorhead to Buffalo River State Park
- Priority 3 - Hawley to Becker County

The Heartland Trail extension through Clay County should be a high priority. The trail will likely have numerous positive impacts to the character of the County and quality of life for residents. Collaboration at a local, regional, and statewide level will be required and efforts should be made to move the project closer to reality.

Off-Highway Vehicles

Off-Highway Vehicles (OHVs) have gained popularity across the region and are a popular outdoor recreation activity. The Minnesota Department of Natural Resources regulates OHVs by type and age of operator. Information about regulations may be found on the following webpage:

- www.dnr.state.mn.us/regulations/ohv/index.html

OHVs may also be used in conjunction with hunting activities across Clay County however, the Minnesota DNR provides separate regulations for operation while hunting. OHVs require registration through the Clay County Department of Motor Vehicles.

With the growing popularity of OHVs in Clay County, the County may consider partnering with the Minnesota DNR to provide as many resources as possible for current and future operators including:

- Information on regulations
- Information on safe operation of OHVs
- Information on where to ride and designated routes
- Information on how to register OHVs

There is a separate snowmobile registration for vehicles designed for travel on snow or ice and steered by skis or runners. OHVs are still regulated and registered separately from snowmobiles.

Snowmobiles

Clay County has approximately 200 miles of snowmobile trails. A majority of trails are maintained by the Clay County Trail Blazers Snowmobile Club, other segments are maintained by the Felton Rough Riders, and Angry Dragons Snowmobile Clubs.

Agassiz Recreational Trail

One of the only separated trails that accommodates OHVs, class II All Terrain Vehicles (ATVs) only, is the Agassiz Recreational Trail. The Agassiz Recreational Trail is a 52-mile natural-surface trail that runs along an abandoned railroad grade and runs from Ulen in the northeast corner of Clay County, north through Norman County along the east side of MN 32. The trail crosses MN 32 near Fertile in Polk County, then cuts toward and ends just south of Crookston in Polk County.

Aside from ATVs, the trail is also used by hikers, bicyclists, and horseback riders.

Future Trends

An important element of the Clay County Transportation Plan is looking beyond what is currently happening, and anticipating emerging mobility issues and opportunities. New development and land use growth will lead to new travel demands on the County's multi-modal system. Metro COG did a comprehensive evaluation of future growth trends at the outset of the Clay County Comprehensive Plan update, based on demographic evaluations and review of jurisdictional land use plans.

County Growth

As shown in the "Community Profile" Chapter, Clay County has seen a sustained rate of growth over the past several decades. The backdrop of steady population, housing, and job growth, in addition to a detailed analysis of regional demographics, is the basis for estimating how the region, including Clay County, may grow through 2045. It should be noted that the future land use estimates as part of this Plan are not an indication of zoning regulations or how development is likely to be phased. Rather this data is for travel estimation and infrastructure planning purposes. Households and employment are the primary factors used to explain travel in Clay County.

Multi-Modal Opportunities

The development patterns and growth predicted for Clay County show that future housing and job growth will be a mixture of new development on the current urban fringe and in small outlying communities,

Agassiz Recreational Trail near Ulen

and infill development that adds more density into existing urban areas. If this is the case, there will likely be more demand for longer auto trips from small communities within the County and new opportunities for transit, bicycling, and walking trips from Clay County's most likely growth areas. However, this is all compounded by the recent COVID-19 pandemic which has permanently changed the manner in which people get to work for a variety of different job sectors, through telecommuting or working from home.

Specific opportunities that are presented from the development concept include:

Increased Demand for Telecommuting Options

Telecommuting from small towns or rural areas of Clay County will likely become a highly desirable feature and driver of growth in these areas. Telecommuting may allow County residents to avoid longer commutes to physical offices however, may also increase the demand for recreational bicycle and pedestrian trips, which was a common data trend analyzed throughout the COVID-19 pandemic. Access, or lack thereof, to broadband or other forms of high-speed internet may increase the demand for people to live and work in small towns or rural areas, which were identified as strengths and opportunities of the County based on public feedback. Telecommuting can also have a major impact on rural transit service, especially any rural transit that is fixed route and or fixed schedule, as it may be hard to predict when and where people may be telecommuting.

Increased Demand for Transit in Existing Service Areas

The new development anticipated for small towns within the county will create more trips to and from the urban FM Area. Rural transit service including park-and-ride policies should be evaluated during the life of the Clay County Comprehensive Plan to track how small towns are growing and if there are reasons to adjust transit services to meet new service demands. Demand for rural transit may also be exacerbated by the infill development that will simultaneously be occurring in the urban portions of Clay County.

Increased Demand for Walking and Biking

Along with spurring an enhanced environment for rural transit ridership, the new development in small towns, new development on the fringe of the urban FM Area, and infill development in the FM Area will increase the demand for walking and biking in Clay County. Clay County is in a good position to highlight and prioritize bicycle and pedestrian connections from the charming rural character of the County and small towns, to the urban FM Area. The growth will make it more critical for the county to coordinate and provide local connections that link residential, commercial, and rural areas through the bicycle and pedestrian network. The increased demand may be exacerbated by telecommuting prevalence.

Increased Viability of Express Transit Services

Express bus and rural commuter transit services are offered in many counties with urban areas to provide a peak transit option for commuters.

These are often offered on longer transit routes between small communities and major employment centers, with limited stops to make the travel time lower. Park-and-ride options are often offered with the express service. Two development trends will make express transit service potentially more attractive in the future:

- Longer Average Commute Trips - as more housing development occurs on the urban fringe and in small communities across Clay County, travel distances get longer. The longer commutes predicted for Clay County will make express / rural commuter transit service a more viable rural transit option.

- More Centralized Employment - as more employment occurs in one location, such as the central business districts of Fargo-Moorhead, express bus transit becomes a more viable option. The densification of employment in key areas of Clay County will increase the viability of express / commuter transit as a transportation option in the future. However, that is likely a long-term option and dependent on how many people are telecommuting instead of physically going into an office.

Emerging Technologies

The regional transportation system and travel options are in a time of flux. Several emerging trends and technologies have the potential to impact how people travel. The opportunities and disruption to existing travel options presented by these new transportation approaches are anticipated to accelerate over the life of the Clay County Transportation Plan. This section discusses how these trends and technologies could potentially impact the transportation system in local communities, and potential policies and planning activities for Metro COG and Clay County to consider. There are generally two categories of these trends and technologies that are re-shaping our transportation options: new "shared mobility" options and emerging transportation technologies. The remainder of this chapter describes these technologies and their potential impacts.

New Shared Mobility Options

New technologies have enabled several transportation trends to emerge that are changing how people travel. The emergence of smart phones for example, has allowed some existing technologies to provide new types of flexible, on-demand shared mobility services that were not previously available. These new shared mobility options include ride-hailing services, microtransit, and micromobility services.

Ride-Hailing Services

The emergence of smart phones has allowed transportation network companies (TNCs) such as Uber or Lyft to offer private, for-profit personal transportation via ride-hailing apps. Typically these services are offered by private citizens in their own personal vehicles.

The most recent survey of Americans which was published in 2019, asked respondents if they had ever used a ride-hailing service. The results showed that ride-hailing services grew from 15% in 2015 to 36% in 2018. Ride-hailing services have become a significant form of travel in many different types of urban areas and in both suburban and central urban contexts and has been available in the FM Area since 2015.

Although bigger ride-hailing companies such as Uber and Lyft are focused in urban areas, there are several examples of rural ride-hailing providers from across the United States, which is something Clay County may want to follow closely, especially as demand continues to increase. Rural ride-hailing may also increase the feasibility of aging-in-place which may help preserve the rural character Clay County.

Microtransit

Microtransit includes shared transportation systems that can offer fixed routes and schedules as well as flexible routes and on-demand scheduling. Microtransit is ideally suited for paratransit and door-to-door services. Companies such as Via, Lyft, and others are private microtransit operators. MATBUS has started to offer a similar service called TapRide, that provides on-demand service during the week on the NDSU campus. TapRide can be accessed via the smartphone app.

Microtransit is a relatively new endeavor for public transit agencies, with trials of microtransit occurring within the past five years and now exploding into some of the most efficient and popular service transit agencies offer. In many microtransit deployments, public funds subsidize the use of private operators.

Incorporating microtransit services into a region-wide application software tool allows for greater access by users. Investments in microtransit by a region often mirror those of ride-hailing. Similar to ride-hailing in rural areas, Clay County should keep an eye out for rural microtransit applications.

Micromobility Services

Micromobility is unlikely to impact Clay County due to the county's rural character however, it will be important for county staff to have a general understanding about what micromobility services are, especially as they become more prevalent in the region or as more rural applications begin.

Micromobility is a group of shared transportation modes, including bicycles and e-bicycles (bike share), mopeds and e-mopeds, and e-scooters that are paid for through an app. These transport devices can be used throughout a city/town, and are often an effective means of providing a first/last-mile function for transit lines.
Great Rides Bike Share is a bike share service that operates in the region, but does not currently work via app.

Companies such as Bird, Lime, Uber and Lyft are offering traditional and electric-assist bicycles and e-scooters through both docking and dockless systems. The rental of these devices occurs through a phone app. These privately-sourced services have emerged in hundreds of urban areas around the country in the last few years. Hundreds of these vehicles can show up in a city, virtually overnight, creating issues with the new mobility options they bring.

Metro COG has researched best practices and lessons learned from communities that have dockless bikeshare and/or e-scooter share programs. Metro COG developed guidelines for local jurisdictions based on best practices from across the U.S. and is currently working with Fargo, Moorhead, and West Fargo on the anticipated deployment of e-scooters within the FM Area.

Mobility as a Service

Mobility-as-a-service (MaaS) is the concept of a seamless system of transportation options that a person can access and pay for on demand through use of smartphone technology. Users do not need to own a personal vehicle, or know the bus schedule to travel. They can open and app and tell it where they want to go, and the MaaS provides them a menu of modal options, travel times, and costs from which they can select. Often these apps provide a single payment account that allows a seamless transaction for both traveler and provider. The apps can offer a range of ride-hailing, microtransit, micromobility, traditional public transit, and bike sharing options. MaaS is typically used in urban areas but could greatly benefit rural Clay County residents. Clay County and Metro COG should continue to collaborate in a future deployment of MaaS to provide services that share transportation data for users to access and does not exclude rural mobility options.

Implications of Shared Mobility Options

There are potential transportation system impacts that are predicted to accompany the shift to these new mobility options. In some cases, these impacts are being seen in some metropolitan areas of the U.S. These secondary impacts are summarized later in this section.

Evolving Technologies

In addition to these new trends in transportation, there are several transportation technologies that have continued to develop and have the potential to radically change how people in Clay County travel and live. These technologies include: Connected and Autonomous, electric vehicles, and smart cities.

Connected and Autonomous Vehicles

Connected vehicles are technology-enabled automobiles, trucks, and buses that can communicate with each other and infrastructure.

MaaS Interface (source: cityinnovatorsforum.com)

Automated vehicles are technology-enabled automobiles, trucks and buses where at least some vehicle movement and guidance functions are completed by the vehicle without human input.

Connected and Autonomous Vehicles (CAV), or Automated Vehicles, have received extensive attention, investment, and have gone through rigorous testing by private companies in the last several years. CAV represents a confluence of technology innovations and a conglomerate of industries. Industries considered separate in the past – the automotive and high-tech industries – are now blurring into a booming automotive tech industry.

Vehicle Fleet Electrification

As the price of batteries drops and technology and performance of batteries increases, electric vehicles are becoming more price and performance competitive with traditional combustion-engine (gasoline-powered) vehicles. There are estimates that the cost of an electric passenger car's battery will drop quickly, from 57% of the vehicle cost in 2015 to 20% of vehicle cost in 2025. That same report indicates that the life-cycle cost of owning an electric vehicle and a combustion engine vehicle will be equivalent in 2022 for larger commercial vehicles. During the planning horizon of the Clay County Comprehensive Plan, it is anticipated that electric vehicles will become a much larger percentage of the vehicle mix.

There will be benefits to this transformation, particularly for the environment as fewer overall greenhouse gas emissions, and other regulated air pollutants, are emitted with the conversion to electric-powered vehicles. One of the challenges of wider vehicle fleet electrification is the development of an effective charging network. Public and private entities will need to evolve and provide the infrastructure required to support these wide spread charging needs. As of June, 2021, there is only one public electric vehicle charging location available in Clay County. The charging station is located near the northeast side of the junction between I-94 and US 75 (8th St S) in Moorhead.

Another challenge the state and Federal governments will need to respond to in the near future is how this shift will affect transportation funding. Federal and state gas taxes pay for the majority of current transportation funding. If transportation transitions from motor fuel to electricity, new and different fees will need to be collected from the users of the transportation system.

Waymo Level 4, Driverless CAV (source: waymo.com)

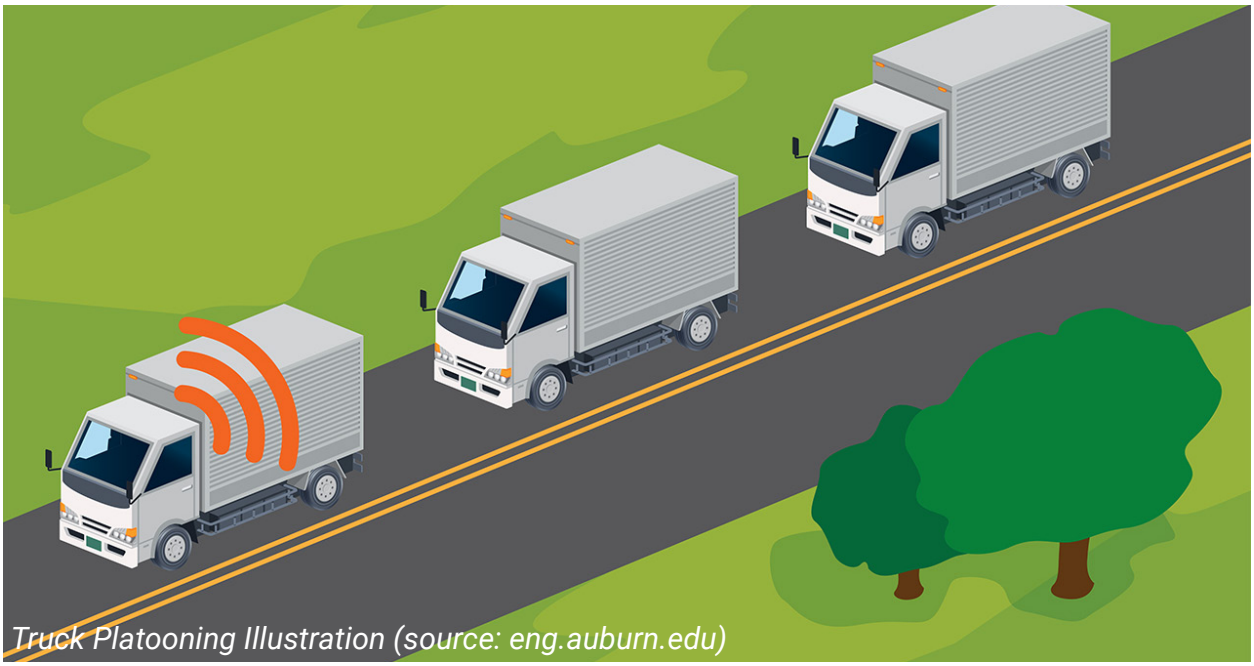
Autonomous Freight

CAVs are not only predicted to impact the way individuals move through cities, but this technology is expected to change the way we move goods as well. With several companies testing freight CAV pilots, many believe that these vehicles could be operating on highways and in cities within the short- and mid-term (2021-2030). As of 2021 there are several autonomous freight pilot programs happening in areas across the U.S.

Along with CAVs, safety is touted as the main benefit of freight CAVs. An additional business advantage of autonomous freight vehicles is what is driving the development of this transportation technology: freight CAVs might eventually not require a driver or a single "lead" driver if vehicles are "platooning". Vehicles without drivers means that the operating costs for highway freight companies could potentially be reduced and thus, the total cost of shipping goods diminishes.

Freight vehicles can "platoon" with two or more trucks coordinating cooperative adaptive cruise control, which allows for increased efficiency and fuel savings, reduced congestion as following distances between vehicles may be decreased, and improved safety as the freight vehicles are able to communicate to address potential collision risks. Lower costs could in turn induce more demand for highway freight services as shipping costs decline.

With freight automation, there are valid and real concerns that freight CAVs will negatively impact labor needs of the freight industry. As freight CAVs become viable, the need for freight operators might potentially decrease. Industry might also be more accepting of freight CAVs as there is currently a shortage of freight operators in the United States in light of increasing demand for these services. Freight CAVs will require service and maintenance, which will require some workers with different skills.



Truck Platooning Illustration (source: eng.auburn.edu)

As shipping costs decline, local retail establishments may see significant additional competition as individuals might be able to purchase an item online and have it delivered within a matter of days at cost that is comparable to visiting a retail location for the same item. Thus, future transportation networks may need to account for increased freight activities on all types of roadways.

Status of Connected and Autonomous Vehicles

The Society of Automotive Engineers has established six levels of vehicular automation, which has become the industry standard for discussing CAV technology. Levels 0, 1, and 2 are considered minimal automation and require the full engagement of the driver at all times while operating the vehicle. At Level 3, the majority of driving tasks are automated but the driver may still be required to take over in certain instances. Level 4 is considered full automation, where all driving tasks can be undertaken by the vehicle in most conditions. Finally, at Level 5, the vehicle is capable of driving everywhere in any condition without human intervention.

The most advanced CAVs currently available employ Level 2 technology that offer drivers limited automated capabilities that still require the driver's full attention. While the current CAV technology is only at Level 2, the technology is rapidly developing and much discussion regarding the timeframe of when Level 4 CAVs will be commercially available. There are a range of forecasts predicting what level of market penetration Level 4 and 5 CAVs will see in the coming years. While those predictions have a wide range, many experts predict that we will see a significant number of autonomous cars on the road by 2045.

CAVs communicate with one another, called vehicle-to-vehicle (V2V), and with surrounding infrastructure, called vehicle-to-infrastructure (V2I). Through communication with the environment around them, connected vehicles (CVs) can help address traffic safety and efficiency concerns. Adopting CVs in local transportation systems will require new infrastructure to support them. V2V communication allows vehicles to share information like speed, direction, and location directly with other vehicles operating in the roadway. This information can then be used to alert other drivers of potential collision risk while traveling. V2V communication technology is expected to be available in cars, trucks, buses, and motorcycles, and many hope it will be extended to bicyclists and pedestrians to further enhance the safety of both motorized and non-motorized road users.

Safety is the major benefit anticipated with CAVs as these vehicles could reduce instances of human error that may lead to automobile collisions by automating driving tasks and communicating with other vehicles and infrastructure. Through V2I and V2V communication, travelers would receive collision warnings instantly, while the infrastructure would help better manage traffic flows through more precise signaling and real time data collection. The National Highway Traffic Safety Association estimates that up to 80% of non-alcohol related vehicle collisions could be prevented through the application of V2V and V2I technology alone. Bicyclists and pedestrians could see a safer environment in the future, as CAVs are being designed with sensors, cameras, and other devices to aid in detecting bicyclists and pedestrians, along with the hope that mobile devices carried

by non-motorized users could alert CAVs to their location for crash avoidance.

One challenge in planning for CAVs is the uncertainty of how these vehicles will be deployed: whether as publicly available shared fleets or as privately owned vehicles similar to today's car ownership model. This uncertainty has implications for infrastructure and land use decisions as CAVs are predicted to reduce parking demand in high cost locations, and thus the amount of land allocated for this use might be reduced. Should CAVs be deployed as publicly shared fleets, the parking requirements could be drastically lower than those necessary for a private ownership model.

Impacts of Emerging Technologies

The emerging trends being seen in transportation have the potential to offer some benefits, especially for those who are currently faced with mobility challenges. An increased number of relatively inexpensive and on-demand mobility services, such as ride-hailing and microtransit, can provide increased, on-demand mobility for elderly and disabled residents who do not or cannot have access to a personal automobile. These new mobility options can help disadvantaged and underserved individuals access all the economic opportunities and amenities their community has to offer.

Land Use

There are potential land use outcomes that might arise with the adoption of these transportation technologies. There are competing market forces with these potential land use outcomes, and there are still many uncertainties for planners and communities to monitor.

- Reduced Parking Demand - The emergence of ride sharing has already been noted to reduce parking demand in some locations such as airports, universities, and entertainment districts. CAVs have the potential to alter the demand for parking across metropolitan areas. CAVs can but will not need to park; under a ride share model they would circulate via the street system to their next rider. Under a private vehicle model they could drive themselves back to the commuter's home to park rather than park in high cost areas. This shift might mean that land currently dedicated to parking could potentially be reclaimed for other residential or commercial purposes. Parking garages across the country are being designed with adaptive reuse in mind, allowing these structures to be converted to offices or living spaces once their original use is no longer needed. However, in the short term, municipalities are met with the challenge of planning capital improvements to serve their immediate growth needs in face of the looming uncertainty of if and when CAVs will begin disrupting transportation and land use systems. One method to addressing this challenge is to integrate shared mobility and establish these modes as first and last mile connectors to public transit, so that individuals are encouraged to use alternate modes of travel instead of a private vehicle.

- Land Conversion - Parking reuse and reductions cited above might also be a tool for encouraging density in urban areas. The trend to design parking garages as adaptive reuse spaces for residential use can be a mechanism for constructing multi-family housing units and mixed use developments.

- Productive Communities and Potential Impact on Sprawl - If fully deployed, CAVs will allow occupants to use their travel time for activities other than driving, such as work or leisure activities such as reading, sleeping, or using the internet. This potential outcome termed "productive commutes" can have some implications on future land use. As individuals realize the time-savings related to being disengaged from the task of driving, long commutes viewed as costly and an annoyance can now be viewed as an opportunity to be productive. This can lead to the development of a perception that longer commutes are no longer undesirable, which in turn could very likely encourage urban sprawl as individuals may elect to live further from city centers and their work places. However, shifting preferences for home locations among Americans shows that many individuals now prefer living in denser, more walkable urban centers. While the concept of productive commutes does give rise to fears of urban sprawl, communities can leverage smart growth principles and encourage alternate transportation modes to preserve denser and more walkable cities.

Travel Safety

As previously noted, removing the driver from the driving task can greatly improve roadway safety. The increased efficiency and safety of roadways due to CAV technology can ultimately deliver significant benefits to society as the high costs of both congestion and traffic collisions can be alleviated. While roadway safety is one of the most promising outcomes of integrating CAVs into transportation networks, there is a need to ensure that these vehicles will not be prioritized over pedestrians and other road users. The increased efficiency of CAVs due to their ability to communicate and coordinate with one another could see future roads as endless streams of these vehicles without adequate space for pedestrians and bicyclists. In planning for this technology, communities must prioritize the human experience by ensuring complete streets, retaining the human scale in developments, providing the appropriate amount of bicycle and pedestrian infrastructure, and revising zoning and subdivision regulations to encourage development that provides access to shared modes and public transit.

Traffic Congestion and Traffic Reliability

Increased vehicular capacity attributing to shared CAVs can reduce congestion as the number of vehicles operating in public roadways declines. Fewer crashes and reduced bottlenecks can eventually lead to significantly higher levels of travel reliability.

Emerging transportation trends should be followed carefully. Trends may be just that, a trend, and the County should conduct further analysis to determine how emerging technologies could impact the transportation system long-term before responding through major investments.

Contributing Planning Activities

Contributing planning activities include such plans that Clay County may reference to guide future transportation system decisions. The following list is included as a reference and is not intended to be a comprehensive list of transportation planning activities:

- *Metro Grow: 2045 Metropolitan Transportation Plan* (Metro COG, 2019)
- *MATBUS 2021-2025 Transit Development Plan* (Metro COG, 2021)
- *Interstate Operations Analysis* (Metro COG, Ongoing)
- *Fargo-Moorhead Metropolitan Bicycle & Pedestrian Plan Update* (Metro COG, Ongoing)
- *Fargo-Moorhead Metro Bikeways Gap Analysis* (Metro COG, 2019)
- *Minnesota GO* (MnDOT, Ongoing)
  - The Statewide Multi-modal Transportation Plan provides reference for all of Minnesota's family of statewide transportation plans
- *District 4 Freight Plan* (MnDOT, Ongoing)
- *District 4 Bicycle Plan* (MnDOT, 2019)

Clay County Financial Analysis

Funding for Clay County road projects includes Federal, State, and local funds which include County and municipal revenue sources. Metro COG analyzed Clay County construction programs between 2012-2021 to estimate future revenues for short- (2026-2030), mid- (2031-2040), and long-range (2040-2045) revenues. All implementation projects should show fiscal constraint meaning any transportation implementation projects should not exceed the estimated revenues for the given timeframes.

County Revenue Sources

State Aid - Regular (Construction)

Clay County receives an annual apportionment of State Aid funding from the State of Minnesota through MnDOT. These funds are intended for use on County state-aid highways owned and operated by Clay County. Between 2012 and 2021, the amount has grown between 1-2% annually however, decreased between 2020 and 2021. The County assumes apportionments of approximately $3,700,000 annually between 2022-2025. In accordance with Minnesota Rules, Chapter 88200.1400, Subdivisions 1 and 2, 40% of the regular allotment must be set aside for general maintenance of County state aid highways.

State Aid - Regular (Maintenance)

Clay County receives an annual apportionment of State Aid Maintenance funding from the State of Minnesota through MnDOT which must be used for maintenance of the County state aid highway system. Between 2012 and 2021, the amount has grown from $1,770,963 in 2012, to $2,417,660 in 2021. Metro COG assumes apportionments of $2,400,000 annually between 2022 and 2025.

Maintenance funds may be used to offset operations and maintenance costs incurred by Clay County and will not be used to calculate future revenues for construction.

State Aid - Municipal (Construction)

Clay County receives an annual apportionment of State Aid Municipal funding from the State of Minnesota through MnDOT for use on county state-aid highways that run through communities with strong interest on said street. The program goals are to provide safety for users, adequate mobility and structural capacity, and an integrated transportation network. Between 2012-2021, the amount has remained relatively stable, averaging about $244,000 annually. The County assumes apportionments of approximately $240,000 annually between 2022-2025. In accordance with Minnesota Rules, Chapter 88200.1400, Subdivisions 1 and 2, 40% of the regular allotment must be set aside for general maintenance of County state aid highways eligible for State Aid Municipal funding.

State Aid - Municipal (Maintenance)

Clay County receives an annual apportionment of State Aid Municipal Maintenance funding from the State of Minnesota through MnDOT which must be used for maintenance of the county state aid highway system in municipal communities. Between 2012 and 2021, the amount has grown from $156,511 in 2012, to $193,768 in 2021. Maintenance funds may be used to offset operations and maintenance costs incurred by Clay County and will not be used to calculate future revenues for construction.

County Road Mill Levy

Clay County levies taxes annually for County Road projects. The County currently levies $400,000 annually and it is assumed that it will levy $400,000 through the foreseeable future.

Wheelage Tax

The Wheelage Tax came into effect in 2014 and funds can only be used for construction or maintenance projects on Clay County roads or bridges. The County receives 70% of the Wheelage Tax assessed in the County, with 30% going to Municipalities. Between 2014 and 2021, the average amount was $368,245 annually. Clay County assumes apportionments of $372,000 annually between 2022 and 2025.

Town Bridge Funding

Clay County receives an annual apportionment of Town Bridge funding from the State of Minnesota through MnDOT which can be used for up to 100% of eligible township bridge rehabilitation, reconstruction, or other necessary township bridge projects. Between 2012-2021, the amount has grown from $241,197 in 2012, to $514,540 in 2021. Metro COG assumes apportionments of approximately $500,000 annually between 2022 and 2025.

Town Road Funding

Clay County receives an annual apportionment of Town Road funding from the State of Minnesota through MnDOT which can be used for up to 100% of eligible township road rehabilitation, reconstruction, or other necessary township road projects. Between 2012 and 2021, the average amount was $545,324 annually. Metro COG assumes apportionments of $550,000 annually between 2022 and 2025.

Discretionary County Revenue Sources

There are numerous discretionary or competitive funding sources for transportation projects in Clay County. The County has received an average of $413,376 annually in Federal Highway discretionary funds between 2012 and 2025 however, that average is based upon five projects which were eligible and received said federal funds. Federal bridge projects averaged $100,449 over the same timeframe in which Clay County received federal funding for two eligible bridge projects.

Federal Funding Sources

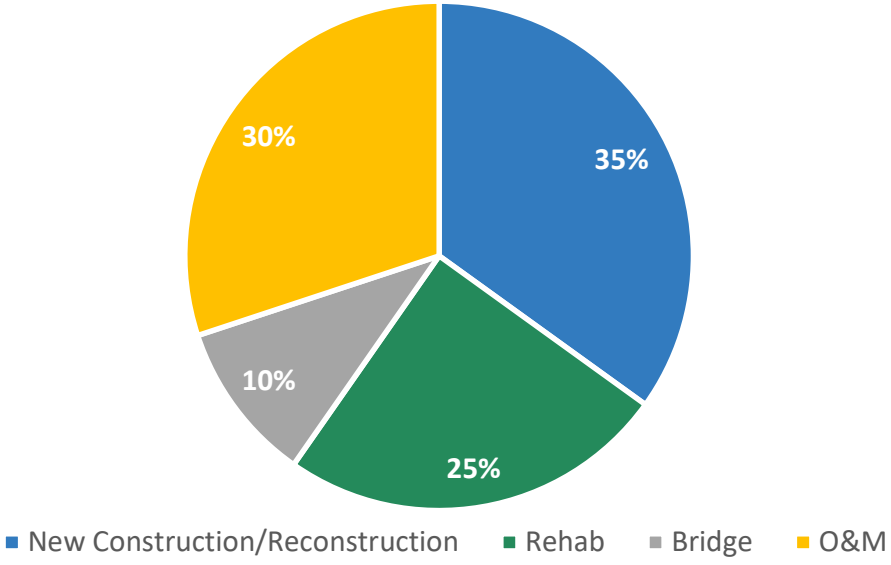
Most federal aid programs that Clay County is eligible for are outlined in Metro COG's Transportation Improvement Program (TIP). The process by which Clay County applies for federal funding is also detailed in the TIP document, which is updated on an annual basis. Federal aid programs are subject to change based upon current transportation legislation and Metro COG works closely with MnDOT to ensure the list is as current and applicable to Clay County as possible:

- Surface Transportation Block Grant Program (STBGP)
- National Highway Freight Program (NHFP)
- Highway Safety Improvement Program (HSIP)
- Transportation Alternatives (TA) Program
- Section 5310 (Transit)
- Section 5311 (Transit)

State Funding Sources

The following list of State Funding sources is not included in Metro COG's TIP; however, a quick analysis concluded that Clay County would likely be able to identify an eligible project for state funds listed. Similar to federal aid programs, state programs are subject to change based upon state legislation or state bond funding.

Figure 5.21 - 2012-2021 Transportation Spending by Typology (source: Metro COG)



- Transportation Economic Development (TED) Program
  - Proposed project must have a trunk highway purpose to improve, enhance, or modify a state trunk highway or highway right-of-way. Projects within the State's trunk highway right-of-way would be eligible.
  - Two trunk highways run through Clay County, US 10 running east-west and US 75 running north-south

- Local Partnership Program (LPP)
  - Eligible projects should provide a clear benefit to the trunk highway system (US 10 and US 75) including the local community.
  - Similar to the TED Program where work within the State's trunk highway right-of-way may be eligible for funding.

- Safe Routes to School (SRTS) Program
  - SRTS program is intended for projects that improve safety, reduce traffic, and improve air quality near schools.
  - Several state funded grant opportunities ranging from planning and engineering grants to grants for construction of eligible and selected projects.
  - County Road 34, for example, is just south of the Ulen-Hitterdal School District's K-12 building in Ulen, MN.

- Local Road Improvement Program (LRIP)
  - Intended for eligible local road construction, reconstruction, or rehabilitation as specified by the State
  - Clay County received LRIP funding in 2018.
  - LRIP has been funded through state bonding efforts dating back to 2005

Historic Spending

Figure 5.21 reflects the historic spending breakdown by project typology for all Clay County Construction Program projects between 2012 and 2021. It should also be noted that between 2012 and 2025 (last year of the construction program) the total investment in Clay County's transportation system, including operations and maintenance costs, will be approximately $130,000,000 however, a majority of funding is from the State of Minnesota and includes Federal and Municipal funds as applicable.

Operations & Maintenance

Operations and maintenance (O&M) costs were developed for Clay County as part of the 2045 Metropolitan Transportation Plan (MTP) update, the region's guiding long-range transportation plan. Although the plan was completed in 2019, O&M costs for subsequent years have been calculated assuming a 4% annual inflationary rate, unless specified otherwise by Clay County Highway Department staff. For 2021, O&M costs for the Highway Department are estimated to be $3,024,102.

O&M costs reflect the investment needed to keep the Clay County Highway Department running including but not limited to routine maintenance projects not listed in the Capital Improvement Program (CIP), staff payroll, fleet maintenance, snow removal, and other basic overhead costs that keep the Highway Department running. It is essential that O&M costs are calculated for future years to ensure financial responsibility of a safe and effective Clay County transportation system.

Future Transportation Needs

Future Spending

Clay County may consider tracking future transportation spending closely to ensure investments are forwarding the goals and objectives of the Comprehensive and Transportation Plan. By setting investment targets for projects such as safety, bicycle and pedestrian, or pavement management projects the County should start to achieve more goals and objectives as related to the plan. The tool may also be important information to update the Clay County Board of Commissioners and the general public about the progress being made on the Transportation System.

Clay County should continue to participate and collaborate with Metro COG and MnDOT to pursue discretionary funds. Competitive funding sources may help sustain the high quality transportation system of the County and supplement regular funding sources for major investments or other critical transportation projects.

County State Aid Highway 40 in Hagen Township

Agassiz Recreational Trail near Ulen