



City Council Memorandum

To: Mayor Fasbender & City Council Members

From: John Caven, Assistant City Engineer

Date: August 12, 2024

Item: Consider Resolution of Support – CSAH 42 Corridor Study Recommended Scope of Improvements

Council Action Requested:

The Council is requested to consider the attached resolution indicating support of the recommended project scope for improvements to CSAH 42, tentatively scheduled for construction in 2028.

Background Information:

In 2021, Dakota County performed a pedestrian crossing assessment to evaluate pedestrian safety crossings along its corridors. The Mississippi River Greenway (MRG) trail crossing on CSAH 42 between Pleasant Dr and Madison St was evaluated. The study concluded this location would benefit from a median refuge island to reduce the pedestrian crossing length. However, it also recommended the network of crossings on CSAH 42 from Lock Blvd to Pine St be evaluated in the near future.

In 2023, Dakota County partnered with HR Green to evaluate the corridor. An open house was conducted on January 23, 2024 to gather input from area residents to identify difficult crossings and understand general usage patterns. The project team subsequently developed four alternatives ranging from short term (low cost) solutions to long term (high cost) solutions. An open house was conducted on May 6, 2024 to gather additional input from area residents on these possible solutions.

Feedback from the open houses and corridor data collection emphasized the need for vehicle speed reduction, trail connectivity, and reduced pedestrian crossing lengths along the corridor. Elimination of vehicle bypass lanes and reduction of underused left turn/right turn lanes would create a safer corridor and reduce vehicle/pedestrian conflict points. The recommended solution includes (see attached Corridor Study Report):

Bypass Lanes

- Eliminate unsafe bypass lanes at 1st St, Hospital, Pleasant Dr, Madison St and Monroe St

Turn Lanes

- Remove low volume right turn lanes at Monroe St and Madison St
- Add left turn lanes at 1st St and Pleasant Dr to accommodate high turning movements

Crosswalks

- Evaluate need for painted crosswalks on Monroe St, Madison St, Pleasant Dr and at bump out locations.

Trail

- Extend trail on south side of CSAH 42 from Monroe St to Lock Blvd
- Convert existing sidewalk on south side of CSAH 42 from Pleasant Dr to River St to a wider multi-use trail.
- Extend trail on south side of CSAH 42 from River St to Pine St

Install Bump Outs

- Riverdale Dr (west side of intersection)
 - Establish safe crossing location
 - Reduce pedestrian crossing length
 - Evaluate need for pedestrian crossing signage and painted crosswalk.

- MRG Trail (midblock between Madison St and Pleasant Dr)
 - Remove trail on north side of CSAH 42 to eliminate unnecessary redundant crossing at Pleasant Dr.
 - Evaluate need for pedestrian crossing signage and painted crosswalk.

- Between 1st St and 2nd St & along west side of River St
 - Provide reduced crossing length on west side of horizontal curve with poor site lines.
 - Provide safe crossing for neighborhoods to the south.
 - Evaluate need for pedestrian crossing signage and painted crosswalk.

Financial Impact:

The City is responsible for 15% of the costs associated with the corridor study. Any future project will be budgeted through the normal budgetary process and likely subject to the 85/15 cost share split. Design is scheduled for 2025 with construction tentatively scheduled for 2028. City portion of the design is expected to be approximately \$25,000 and construction to be approximately \$200,000.

Staff Recommendation:

Staff recommends the City Council adopts the attached resolution in support of the recommended scope and features for CSAH 42.

Attachments:

- County Road 42 (Nininger Road) Corridor Study Report

CITY OF HASTINGS

DAKOTA COUNTY, MINNESOTA

RESOLUTION NO. _____

**RESOLUTION IN SUPPORT OF THE RECOMMENDED SCOPE AND FEATURES FOR THE CSAH 42
CORRIDOR STUDY**

WHEREAS, Dakota County performed a pedestrian crossing assessment at Mississippi River Greenway (MRG) trail between Pleasant Dr and Madison St in 2021. It was recommended the entire corridor be evaluated between Lock Blvd and Pine St; and

WHEREAS, Dakota County partnered with HR Green to evaluate the corridor in 2023; and

WHEREAS, A public open house was held January 23, 2024 to gather input from area residents to identify difficult crossings and understand general usage patterns; and

WHEREAS, A public open house was held May 6, 2024 to gather input from area residents on four alternatives ranging from short term (low cost) solutions to long term (high cost) solutions; and

WHEREAS, Public feedback emphasized the need for vehicle speed reduction, trail connectivity, and reduced pedestrian crossing lengths along the corridor; and

WHEREAS, the recommended concept design addresses the aforementioned concerns to a significant and reasonable extent.

**NOW, THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF HASTINGS AS
FOLLOWS;**

1. The City of Hastings hereby supports the implementation of the recommended project scope and features for improvements along CSAH 42 from Lock Blvd to Pine St.
2. The City of Hastings will work in partnership with Dakota County to participate in the Dakota County cost share to complete this scope of work.

ADOPTED BY THE CITY COUNCIL OF HASTINGS, MINNESOTA, THIS 19TH DAY OF AUGUST, 2024.

Ayes:

Nays:

Mary Fasbender, Mayor

ATTEST: _____

Kelly Murtaugh, City Clerk

SEAL



COUNTY ROAD 42 (NININGER ROAD) CORRIDOR STUDY REPORT

JUNE 2024

Hastings – Lock Boulevard to Pine Street



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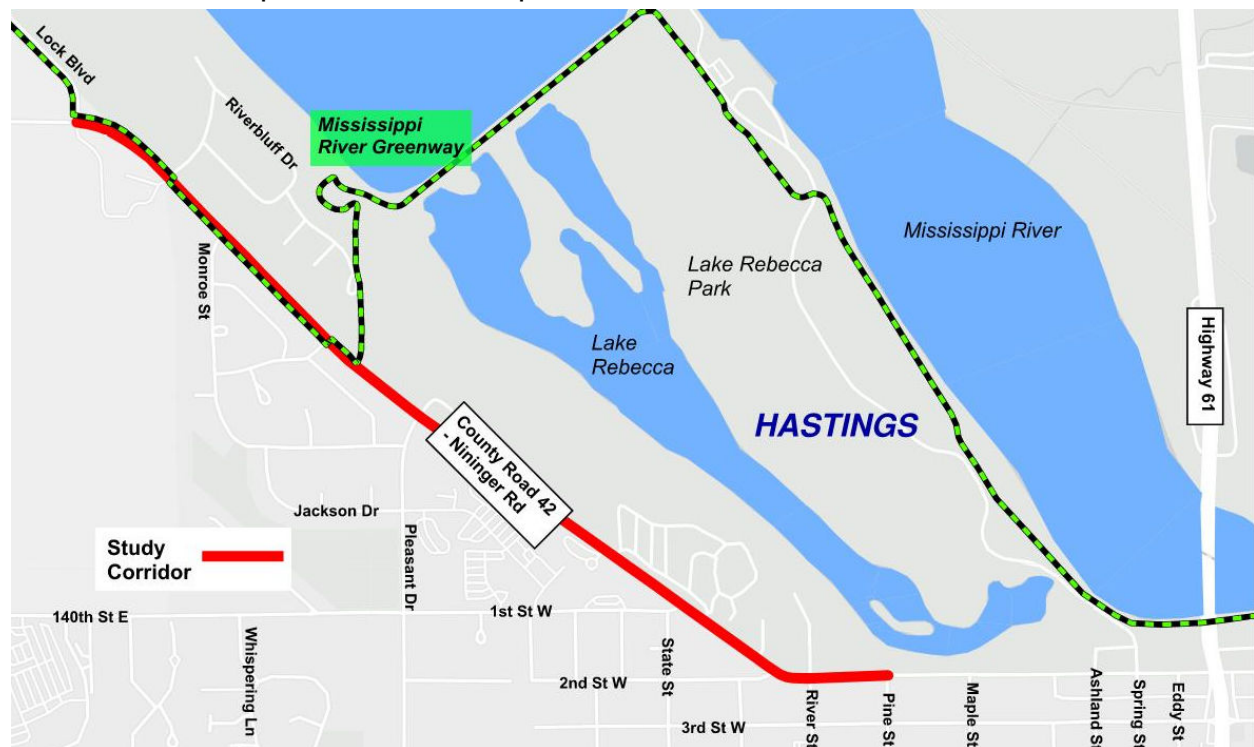
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County Road 42 (Nininger Road) Corridor Study

Project Introduction

Dakota County has collaborated with the City of Hastings to conduct a corridor study for the 1.5-mile segment of County Road 42 (also referred to as Nininger Road or 2nd Street West) from Lock Road to Pine Street. Locally, County Road 42 provides connections between Highway 61 to Highway 55 and continues westward as a major east-west arterial through Dakota County.

This portion of County Road 42 serves as a gateway corridor into Hastings, and as such, features a transition of speed limits from 55 mph on the west end to 30 mph at the east end of the corridor. Average Annual Daily Traffic (AADT) in the corridor ranges between 2,200 (on the west) and 5,200 (on the east). This portion of Hastings is relatively stable in terms of development, with well-established residential areas and features Allina Health United Hospital in the middle of the corridor. There is potential for additional development growth at the west end of the corridor, but new large-scale residential development is not anticipated to occur in this decade.



This subject segment of County Road 42 is a continuous two-lane corridor which features multiple bypass lanes in the westbound direction, allowing motorists to pass by left-turning vehicles at key intersections or access points along the corridor. West of

Pleasant Drive, there are several direct access driveways along the north side of County Road 42

Trails and sidewalks along County Road 42 provide travel paths for pedestrians and bicyclists. However, some gaps in the sidewalk/trail system do exist, most notably on the north side of County Road 42 between approximately 2nd Street and Riverdale Boulevard. These gaps in the pedestrian network become magnified due to the presence of a valued regional trail resource in this corridor – the Mississippi River Greenway (MRG). The MRG includes over 25 miles of paved trail running from St. Paul to Hastings, a portion of which runs concurrent with the study corridor from Lock Boulevard to just west of Pleasant Drive, where the trail turns toward the Mississippi River and the Lock and Dam. The MRG supports more than 400,000 annual trail users. This segment of the MRG in our study corridor requires two crossings of County Road 42 and is representative of the issues that have created a need for this study.



The purpose of the study is to identify solutions that will improve pedestrian and bicyclist safety while helping to create a multi-modal corridor vision that can accommodate long-term development and changing mobility demands in Hastings and on County Road 42.

Study Process

The CSAH 42 Corridor study began with data collection to evaluate the existing conditions. Data collection activities included traffic counts for turning movements, daily volume, and speed. Additional studies were conducted for contaminated properties, wetlands, and geotechnical conditions. The information gathered was used to identify existing issues and concerns of the road and shoulders, drainage and environmental features, traffic safety and operations, and pedestrian and bicyclist accommodations.

The context of the corridor is urban/suburban residential and institutional, with roadway frontage consisting of single occupancy homes and apartments, as well as the Allina Health – Regina Hospital and the Benedictine Living Community – Regina assisted living facilities.

Existing Traffic Conditions

Traffic counts were conducted over the 13-hour period of 6:00AM to 7:00PM on Thursday, September 28, 2023. Findings from the count included the following observations:

- Daily traffic volumes in the corridor range from just over 2,000 vehicles per day (vpd) on the west end at Lock Boulevard, to over 5,000 on the east end near River Street.
- First Street and Pleasant Drive are relatively high-volume local streets connecting to County Road 42, with over 1,600 and almost 1,500 vpd respectively.
- Peak hours of traffic operations were identified for the morning (7:00-8:00AM) and afternoon (4:15-5:15PM); the afternoon peak hour shows slightly higher volumes than the morning peak.
- Analysis of turning movements through the corridor reveals the importance of westbound left-turn movements at both First Street and Pleasant Drive. While counts were not collected for the access locations for the health care facilities along County Road 42, these locations can be interpreted as key destinations as well.
- Some of the local residential roads like Madison show small numbers of left turn movements on to or from County Road 42, with turns often in the low single digits during the peak hour.

Speed Study

This corridor's position at the edge of Hastings presents an opportunity to evaluate traffic speed conditions for potential safety and operations concerns. From west to east through the corridor, the posted speed limit transitions from 55 miles per hour (mph) west of Lock Boulevard, to 45 mph east of Lock Boulevard, and then to 30 mph just west of 1st Street.

A common measure for traffic speed performance on a roadway is to count the speed at which 85% of all vehicles driving through the location are at or below that speed. The following observations for traffic speed were made for 85th percentile and average (mean) speed at three locations in the corridor:

- Between Lock Boulevard and Riverdale Drive: 85th percentile speed = 51 mph; Average speed = 45 mph
- West of Pleasant Drive at the MRG Trail intersection: 85th percentile speed = 49 mph; Average speed = 42 mph

- Between 1st and 2nd Streets: 85th percentile speed = 39 mph; Average speed = 34 mph

The observed speeds for this one day of data collection indicate that average speeds are generally close to the posted speed limits but that there may be a tendency to travel at speeds slightly above the posted limits. Several factors may contribute to these conditions, and it would be difficult to pinpoint specific reasons for this performance. However, given the interest for safe and comfortable pedestrian accommodations, the speed data suggest improvements that help calm traffic through the corridor may be appropriate.

Safety

Historical crash data from the most recently available 10 years (2014-2023) was gathered. Analysis of crash severity was completed to determine the intersections with high safety concerns. In this period there were 14 crashes along the corridor, 70% of which resulted in no apparent injury. The majority of crashes were clustered between 1st St and River St, including the lone serious injury crash that occurred in the corridor. This cluster of crashes is near a curve in County Road 42. One other crash had a “non-incapacitating” injury, and two other crashes identified a “possible injury.” The remaining ten crashes over this ten-year period did not involve an injury.

Public Engagement – Initial Input

In the first phase of engagement, community members were presented with existing conditions data and a blank corridor layout created by the study team. The intent was for the Project management Team (PMT) to collect feedback from the community and users that frequent the corridor and the recreational assets from Lock Boulevard to Pine Street. The feedback directly impacted the concept development in the next phase of the project.

Open House #1

The first open house for this project took place on January 23rd, 2024, from 5:00-7:00 PM. The meeting was held at the Hastings YMCA, in the multi-purpose room. Approximately 30 people attended the open house. 9 participants completed the project survey, participants also submitted 18 comments on the concept roll plot map as well



as in-person feedback that was then documented by the PMT. Following the open house an online survey and comment map was made available from January 22nd – February 15th for participants to provide feedback.

City Council Meeting

Following the open house, Dakota County gave a presentation on the project and public engagement efforts to date at the April 15th, 2024 Hastings City Council meeting. Dakota County provided information on the project background, purpose and need, summarized the data collection and work to date, and stood for questions on the project. Preliminary project alternatives were also shared and discussed with the Council and City staff. Follow-up questions and reactions to the presentation were generally positive, with some clarification requested on turn lane evaluations, potential project costs, and timelines.

Key Issues and Concerns

Whether it was during the in-person open house or through online engagement the prevailing feedback was that speed should be reduced throughout the corridor, particularly in the west half of the CSAH 42/Nininger Road from Pleasant St to Lock Blvd. There was a general concern about the lack of visible and obvious pedestrian and bicycle crossings on CSAH 42. The presence of curves on both ends of the corridor, in addition to the downhill grade on the east end (shown below), created concerns about line of sight and visibility for all road users. The lack of comfortable crossings has further



augmented the sense of disconnect for the trail and sidewalk network that is a valuable resource for the community.

Evaluation Criteria

At the conclusion of the data collection and initial stakeholder engagement, the PMT established key criteria to develop and evaluate alternatives. The evaluation criteria were used to compare each corridor alternative and ensure that proposed improvements address the corridor needs. The following evaluation criteria were developed:

- Trail Continuity, Gaps, and Design – considerations about an overall concern with the availability of trails in the corridor, the need for crossing County Road 42, width of sidewalks or trails as an indicator of user experience
- Speed Reduction and Motorist Experience – evaluate the potential for proposed improvements to reduce speed in the corridor, while also creating a comfortable driving environment with visibility of corridor users
- Social and Natural Environment – general concern for maintaining natural resources and valuable community connections
- Constructability, Maintenance, and Cost – considerations for ability to construct cost-effective improvements that will have long-lasting value and can be maintained effectively through all seasons

Alternatives Development

Following the 1st Open House, the project team conducted an internal workshop to generate an initial range of alternatives for consideration. The alternatives were evaluated during PMT meetings and refined prior to the second Open House in May 2024. The evaluation criteria and stakeholder engagement feedback shaped the concept development for the corridor and were instrumental in forming a set of four alternatives. This set of alternatives collectively represented a range of timeframes for potential implementation and associated construction costs. The corridor concepts were evaluated against the established criteria. Each of the alternatives built on elements of the last, until the 4th represented the most complete alternative that could be implemented as part of the long-term vision for the corridor. All four alternatives were later presented at the second public open house to gather feedback on the design elements that were determined to be variable through the evaluation process.

Public Engagement – Feedback on Alternatives

In the second phase of engagement, community members were presented with four recommended alternatives, developed with the comments and feedback received in the first phase of public engagement. The intent was for the PMT to collect feedback from the community on the developed alternatives. The feedback directly impacted the development of these alternatives in the next phase of the project.

Open House #2 (May 2024)

The second open house for this project took place on Monday May 6th, 2024, from 4:30–6:30 PM. The public meeting was held in the Hastings YMCA Multi-Purpose Room, approximately 30 people attended the open house. Following the open house an online comment map was made available from May 5th – May 17th on the project website for participants to provide additional feedback.



Recommended Alternatives

Following the second open house meeting the recommended alternatives were reviewed in light of feedback received from the public, the evaluation criteria, and also the ability to implement each alternative, with a priority focus on determining an option that is available for short-term implementation (for example, it could be built with minimal obstacles within the next 3-5 years). A key early determination during this evaluation was to no longer consider Alternative 2 – Pedestrian Medians as a viable short-term option. This was in response to concerns surrounding the long-term developmental impact of the medians, in favor of the pedestrian bump outs shown in Alternative 1 which were seen as more in line with the long-term goals for the corridor and more easily implemented without foregoing other potential improvements throughout the corridor and on adjacent city streets.

Priority (Short-Term) Improvements

Alternative 1 represents the short-term vision for priority improvements to this corridor. The main emphasis of this alternative is the implementation of four Bump Outs along the corridor to ensure pedestrian safety at existing gaps between trail infrastructure. Current conditions lead to pedestrians and bicyclists taking risky, dangerous crossings but the Bump Outs would create infrastructure designed to allow them to cross safely. Alternative 1 received positive feedback during Open House #2 given it is easy, cost-effective and timely to implement, as well as fitting into the Long-Term vision for the corridor.

Alternative 1 - Pedestrian Bump Outs

County Road 42 - Dakota County Public Meeting



- Alternative 1 Features**
- Eliminate all bypass lanes
 - Bump outs at four sites
 - Riverdale, MRS, 1st/2nd Mid-block, River Street

- Legend**
- Existing multi-use trail
 - Existing sidewalk
 - Mississippi Place Overlay
 - Asphalt turn lane
 - Median right turn lane
 - Queue protection strip
 - Pedestrian bump out

See Appendix A for depictions of the Recommended Priority Improvements for County Road 42

Opportunistic Improvements

Opportunistic improvements to Alternative 1 offer potential low cost and/or minimal design and approval concepts that further augment the study corridor objectives. Notable features with these opportunistic improvements include the westward extension of trail along the south side of County Road 42 to Lock Blvd and the conversion of existing sidewalk east of Pleasant Drive into a wider multi-use trail. Along with extending the trail east of River Street to Pine Street, these changes would effectively create a continuous trail along the south side of County Road 42 through the entire study corridor.

Mid-Term Improvements

Alternative 3 expands upon the proposed improvements in Alternative 1, representing Mid-Term opportunistic improvements to the corridor. The main proposed improvements are the proposed on-street dedicated bike lanes along CSAH 42 where trail gaps are evident. Proposed bike lanes would take the place of existing bypass lanes that pose potential risk to multimodal transit users along the corridor. Other features dedicated to pedestrian and bicyclist safety include speed control curb extensions, new sidewalks, pedestrian bump outs, concrete medians for speed control, as well as re-routing sections of the multi-use trail.

Long-Term Corridor Vision Potential

Alternative 4 represents a potential Long-Term vision for the corridor, incorporating elements from the other alternatives and expanding to incorporate new features that may be appropriate as corridor travel demands changes. While this alternative attempts represent a holistic vision for pedestrian and bike safety improvements and mobility along the corridor, it would require several years of project development and approvals

in order to be fully built. Most notably this alternative includes 2 roundabouts, one at Lock Boulevard and one at Pleasant Drive. This vision includes the incorporation of medians that act as traffic calming devices in place of the curb bump outs that have been shown in short-term improvement recommendations.

Perhaps more importantly for this longer-term vision, the corridor is envisioned has having multi-use trails on both sides of County Road 42. This ultimate build out would most effectively address the demand for continuous trails and minimizing the need for crossing County Road 42. A substantial obstacle to this sort of build out is the presence of cemeteries on either side of County Road 42. With property lines adjacent to the corridor, the risk of impact to cemeteries means any such construction project would need to clearly avoid those parcels.

A combination of improvements such as these depicted in Alternative 4 would require substantial public engagement and agency coordination and approvals before being built. Such a process would likely result in variations from the improvements shown as more design considerations, operational impacts, maintenance needs, and public feedback are weighed.

Recommended Preliminary Design for Corridor Improvements

Within the design decisions and refinements described above, Dakota County and the City of Hastings accept the preliminary geometric proposal for the County Road 42 corridor improvement project. This layout will be the culmination of planning and engagement efforts between Dakota County and the City of Hastings.

Implementation Plan

Corridor Improvements Timeline

Dakota County is currently drafting its five-year construction program to identify when improvements to this corridor may be implemented. The alternatives represent a range of potential implementation timelines, where Alternative 1 could be implemented in the near term whereas Alternative 4 would require several years of project development and approvals (including further public engagement) to be fully built.

The project is being incorporated into the 2025 Dakota County Transportation CIP for advancement of final design and right of way acquisition for construction in 2027 in advance of a pavement preservation project on the corridor in 2028. The final design will incorporate the improvements identified in the recommended alternative, as well as other requisite ADA infrastructure improvements along CSAH 42. Implementation of the opportunistic improvements will be predicated on the availability of funding and right of way needs in the corridor.

Mississippi River Greenway (MRG) Improvements & Timeline

As part of this study, Dakota County has evaluated options for Mississippi River Greenway improvements off of the CSAH 42 right of way. A preliminary design assessment of the trail north of CSAH 42 down to the Lock and Dam #2 embankment was carried out in conjunction with the corridor study to assess the ability for improvements to this critical non-motorized trail connection which traverses the Mississippi River valley. The current alignment and profile of the trail segment poses safety and accessibility concerns for trail users due to tight curves, awkward trail intersections, narrow width, poor pavement condition, and slopes in excess of the desired 5% maximum running slope on the Dakota County Greenway system. The preliminary design found that improvements sufficient to bring the trail segment up to Dakota County Greenway standards are feasible within land currently controlled by the City of Hastings and Dakota County with no need for property acquisition.

A full reconstruction of the trail alignment and profile from just north of CSAH 42 down to the Lock and Dam #2 embankment is proposed, along with a resurfacing of the trail segments not fully reconstructed on the embankment and up to the trail connection with CSAH 42. This reconstruction will address concerns about pavement condition, improve curves, sight lines, and trail intersections, and reduce the maximum running slope of the trail to 5% or less. This will fulfill the goals of improving rideability and accessibility of the trail segment. A reconstruction and pavement management project will be immediately advanced to final design and incorporated into the 2025 Dakota County Parks CIP for construction as early as 2025.

Supporting Documents

Alternative 1 - Pedestrian Bump Outs

County Road 42 - Dakota County Public Meeting



Alternative 1 Features

- Eliminate all bypass lanes
- Bump outs at four sites:
 - Riverdale, MRG, 1st/2nd Mid-block, River Street

Legend

- Existing multi-use trail
- Existing sidewalk
- Mississippi River Greenway
- Add left turn lane
- Narrow right turn lane
- Close position ramps
- Pedestrian bump out

Alternative 2 - Pedestrian Medians

County Road 42 - Dakota County Public Meeting



Alternative 2 Features

- Eliminate all bypass lanes
- Pedestrian medians:
 - Pleasant Drive through Mississippi River Greenway
 - 2nd Street intersection
- SCCE option: curb extension to remove bypass lane, right turn lane, or shoulder - does not include pedestrian crossing

Legend

- Existing multi-use trail
- Existing sidewalk
- Mississippi River Greenway
- Median with pedestrian refuge
- Concrete median for speed control
- Speed control curb extends on
- Add left turn lane
- Narrow right turn lane
- Close position ramps
- Pedestrian bump out

Alternative 3 - Bike Lanes

County Road 42 - Dakota County Public Meeting



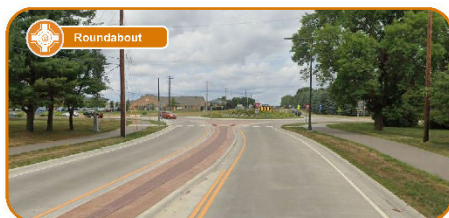
- Alternative 3 Features**
- Eliminate all bypass lanes
 - On-street dedicated bike lanes
 - Proposed sidewalk from River Street to Pine Street
 - Proposed multi-use trail Lock Boulevard to Riverdale Drive

Legend

- Existing multi-use trail
- Existing sidewalk
- On-street dedicated bike lane
- Mississippi River Greenway
- Proposed multi-use trail
- Proposed sidewalk
- Concrete median for speed control
- Add left turn lane
- Remove right turn lane
- Close pedestrian ramps
- Speed control curb extension
- Pedestrian bump out

Alternative 4 - Multi-use Trails

County Road 42 - Dakota County Public Meeting



- Alternative 4 Features**
- Eliminate all bypass lanes
 - Single lane roundabout intersection
 - Pedestrian medians:
 - Pleasant Drive through Mississippi River Greenway
 - 2nd Street intersection
 - New trail on north side: Pleasant Drive to Pine Street
 - Widen sidewalk to multi-use trail on the south side from Pleasant Drive to Pine Street

Legend

- Existing multi-use trail
- Existing sidewalk
- Mississippi River Greenway
- Proposed multi-use trail
- Median with pedestrian refuge
- Concrete median for speed control
- Speed control curb extension
- Add left turn lane
- Narrow right turn lane
- Close pedestrian ramps
- Roundabout
- Pedestrian bump out

Speed Control Features

County Road 42 - Dakota County Public Meeting



Raised crosswalks are ramped speed tables spanning the entire width of the roadway. The crosswalk is demarcated with paint and/or special paving materials. These crosswalks act as traffic-calming measures that allow the pedestrian to cross at grade with the sidewalk. Raised crosswalks are flush with the height of the sidewalk.



Curb extension to remove bypass lane, right turn lane, or shoulder - does not include pedestrian crossing.

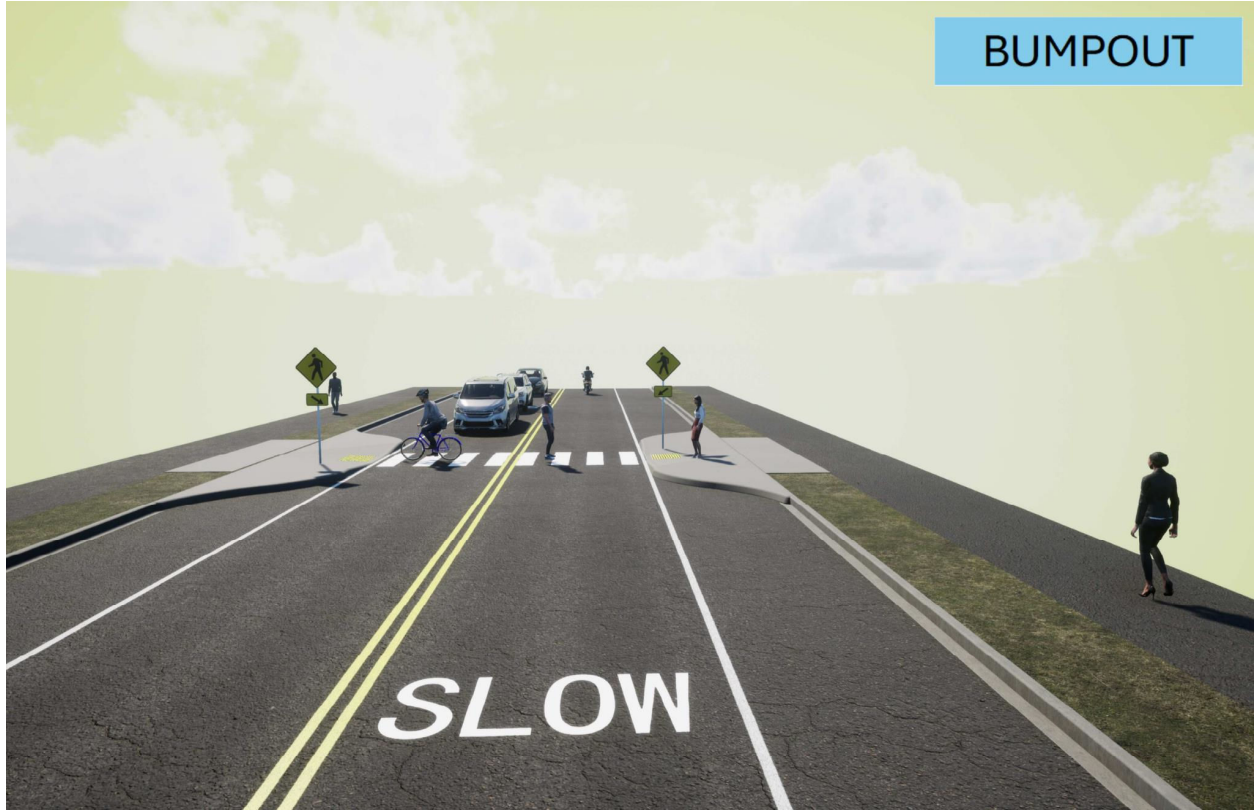
- Remove bypass lanes at the following intersections:
 - United Hospital entrance (between 1st Street and Pleasant Street)
 - Madison Street and Monroe Street



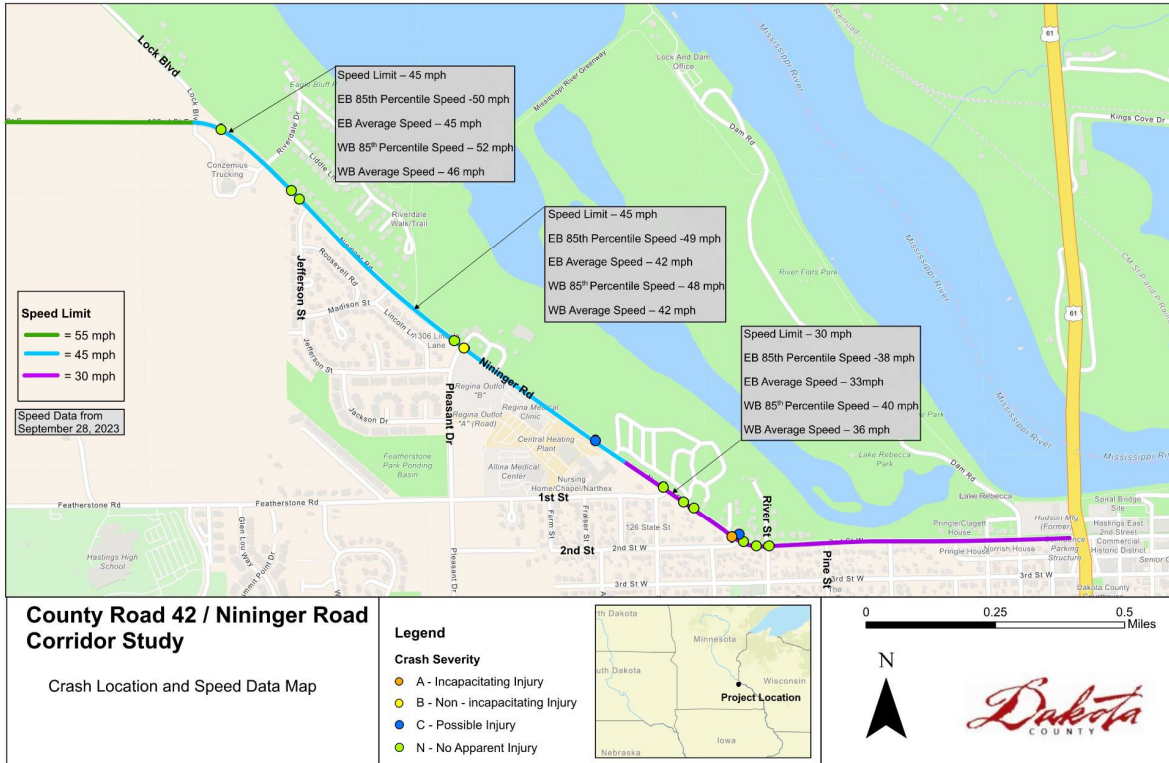
Table 16. Other Key Data – Nininger Road / Madison Street

Other Data Results	Weekday	Weekend
Percentage of pedestrians that waited for a gap in traffic to cross.	16%	15%
Use of various crossings:		
<i>West crosswalk (existing)</i>	72%	20%
<i>East crosswalk (no crosswalk markings)</i>	21%	63%
<i>Did not cross in the crosswalk (both crossings)</i>	4%	11%
<i>Crossed mid-block between Madison Street and Pleasant Drive</i>	3%	6%

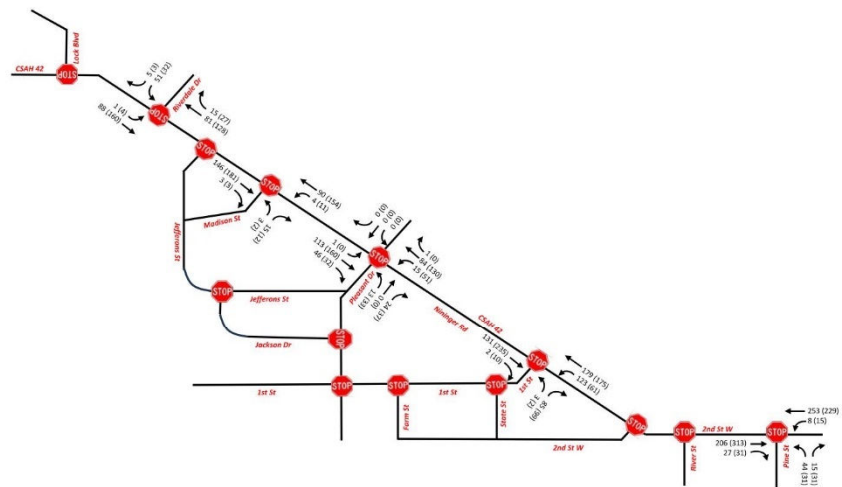
Source: SRF Consulting Group, 2021







Hastings, MN - Nininger Road/2nd Street (CSAH 42) Corridor Volume Map



2023 Existing Volumes - Weekday AM/PM







Rectangular Rapid Flashing Beacon (RRFB)



A crossing enhancement that is activated by a pedestrian and uses two rapid and alternate flashing yellow rectangular beacons. RRFBs are applicable on roadways with higher pedestrian demand, traffic volumes, and traffic speeds. It is a proven safety strategy for reducing crashes per the FHWA with a typical crash reduction of 47 percent. Average cost is \$15,000 to \$50,000 per crossing or \$80,000 to \$100,000 for an overhead system.

Source: Minnesota Department of Transportation

Table 1. Research, Studies, and Guidance Synthesis

Report Name	Author	Background	Relevance
Federal			
Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (2018)	Federal Highway Administration	Organizes an analysis approach of pedestrian crossings which includes: 1) collect data and perform public engagement, 2) inventory existing conditions and prioritize locations, 3) analyze crash history, types, and safety issues, 4) select crossing countermeasures, 5) consult design and installation resources, and 6) identify opportunities and monitor outcomes. The report also includes guidance, definitions of crossing infrastructure treatments, and helpful background on data collection and inventorying best practices.	The guidance document includes a countermeasure table with suggested crossing treatment improvements per the roadway configuration, speed, and traffic volume at the point of crossing. This table formulates the foundation of crossing guidance nationwide and was used as a key reference for this assessment.
Application for Pedestrian Crossing Treatments for Streets and Highways (2016)	National Cooperative Highway Research Program	Provides a synthesis of crossing guidance for cities, counties, and state departments of transportation to identify synergies between them. Though six years old, a thorough description of crossing infrastructure treatments, background, and summary of the impacts of each are provided and still relevant.	Foundational information for crossing treatment guidance and the quantitative safety impact of each.
Human Factors Assessment of Pedestrian Behavior (2014)	Federal Highway Administration	A total of 20 locations were studied across the United States and modeled using results from the analysis. It showed that drivers were more likely to yield to pedestrians in a marked crosswalk versus an unmarked location where the yielding was split between vehicle-for-pedestrian and pedestrian-for-vehicle. Research also showed that the design of the crossing and presence of barriers, even low plantings, can significantly alter how and where pedestrians cross within the intersection (unmarked), a marked crossing, or mid-block.	Provides quantitative support for marked crosswalks within strategic locations as a key infrastructure enhancement for the guidance described in Chapter 3. Engineering considerations for vertical and horizontal crossing design to properly channelize pedestrians is also highlighted in Chapter 3 and supported by this assessment.
Effects of Yellow Rapid-Flashing Beacons on Yielding at Multilane Uncontrolled Crossings (2010)	Federal Highway Administration	A total of 22 locations were studied over a two-year period in three cities. Findings showed that RRFBs increased yield compliance up to 88% as compared to the previous condition without which was zero to 16%. Reductions in yield compliance following the "novelty effect" of drivers becoming used to the infrastructure was found to not exist and yield compliance remained high after two years.	Provides quantitative support for RRFBs, specifically with analysis over a multiyear period to understand how compliance is retained. RRFBs are a key infrastructure enhancement for the guidance described in Chapter 3.
Safety Effects of Marked Versus Unmarked Crosswalks (2002)	Federal Highway Administration	A total of 1,000 marked and 1,000 unmarked locations were studied across the United States. The presence of only a marked crosswalk at an uncontrolled location of a two-lane roadway had no difference in the pedestrian crash rate versus an unmarked crossing. On multi-lane roads with traffic volumes above 12,000 vehicles per day, having a marked crosswalk alone resulted in a higher pedestrian crash rate compared to an unmarked crossing. Crossing infrastructure enhancements reduced the rate overall.	Provides quantitative support for strategic implementation of marked crosswalks when appropriately vetted and combined with other infrastructure as appropriate.

PP.21 Minnesota Data Practices Act

Make available to the public all policies, guidelines and plans concerning highways consistent with the Minnesota Data Practices Act.

PP.22 Capital Improvement Program - Agency Involvement

Involve affected units of government, transit providers and other partners in the annual development of the CIP.

PP.23 Multi-Disciplinary Work Teams

Solicit input from and involve all interested parties in the planning and design of transportation projects to properly reflect community and environmental values.

PP.24 Manage the Adopt-a-Highway Program

Manage a program whereby the public can adopt segments of the county highway system to assist in keeping the highway right-of-way clean.

Implementation of the Public and Agency Involvement principle is supported by the following policies identified in later document chapters: F.1, F.2, F.3, F.4, F.5, F.6, F.7, F.8, F.9, F.10, F.11, F.12, F.13, F.14, F.15, F.16, F.17, M.5, M.6, M.7, M.8, and M.10.

Context-Sensitive Design and Complete Streets

The context-sensitive design principle refers to roadway standards and development practices that are flexible and sensitive to community values and allows roadway design decisions to better balance economic, social and environmental objectives.

In recent years, the importance of transportation design that is sensitive to the surrounding environment and the needs of all roadway users has become a priority. The growing emphasis on community-supportive, environmentally sensitive and multi-modal roadway projects has been exhibited at the federal and state level through funding and design policies. Local governments also have asked for transportation systems that are less disruptive to the adjacent area and are welcoming to all users. Local government input and cooperation will be a major component in the development of context-sensitive design and complete streets.

Complete streets is an approach to road planning and design that evaluates and balances the needs, safety, accessibility and usability of all transportation users to preserve safety and efficiency for all modes. Minnesota Statutes §174.75 identifies complete streets as the planning, scoping, design, implementation, operation and maintenance of roads in order to reasonably address the safety and accessibility needs of motorists, pedestrians, transit users and vehicles, bicyclists and commercial and emergency vehicles moving along and across roads, intersections and crossings in a manner that is sensitive to the local context and recognizes that the needs vary in urban, suburban and rural settings.

The county will implement the complete streets approach during transportation project planning, project development, operation and maintenance activities. This approach helps to maximize the use of county highways and right-of-way to provide a safe, comprehensive and connected multimodal transportation system. Complete streets implementation is based on,

but not limited to, the following: community context, topography, road function, traffic volumes and speed, transit service, freight volumes and pedestrian and bicyclist demand.

Complete streets implementation options are selected depending on each project's unique characteristics. The county will implement the complete streets approach in compliance with State Statutes, State Aid Rules and applicable Minnesota Department of Transportation Policy.

The following **strategies** support the context-sensitive design and complete streets principle:

- **Minimum Urban, Low-Speed, Highway Widths**
Consider use of reduced widths for two-lane, low-speed highways in urban areas to help meet economic, social and environmental objectives. Depending on the context, the county may be required to meet certain minimum width standards to meet safety objectives and funding requirements.
- **Aesthetics**
Consider aesthetic needs on projects to complement context-sensitive design and complete streets philosophies.
- **Context Consideration**
Prioritize transportation projects through a process that considers economic development, local environments and environmental sustainability.
- **Transit, Pedestrian and Bicycle Facility Preservation within County Road Right-of-Way**
Consider transit, pedestrian and bicycle facility preservation needs including ADA requirements. Priority will be given to preservation and rehabilitation projects that increase effective multi-modal and ADA accessibility.
- **Vegetation in Right-of-Way**
Where practical, plant native or appropriate vegetation in county right-of-way to help sequester carbon; shade pedestrians; manage runoff; and provide for bird, animal and pollinator habitat. Participate in pilot projects that have the opportunity to improve roadside habitat when appropriate.
- **Safety Improvements**
Design for safety of pedestrians and bicyclists on the road and trail system, including provision of clear zones for all users including enhanced pedestrian crossings, street lighting, attention to bikeway geometrics, consideration of pedestrian bridges and tunnel crossings along high-speed and high-volume highways where pedestrian destinations are present and incorporation and alignment of curb cuts and signage when appropriate.

Implementation of the Context-Sensitive Design and Complete Streets principle is supported by the following policies identified in later document chapters: F.2, F.3, F.8, F.9, F.13, F.17, T.2, M.10.

