

# VETERANS BOULEVARD CORRIDOR

EXTENSION STUDY

*January 2022*

## TABLE OF CONTENTS

Chapter 1. Existing Conditions .....	1
Chapter 2. Public Input Summary .....	32
Chapter 3. Traffic Forecast Summary .....	49
Chapter 4. Alternative Intersection Capacity Evaluation.....	58
Chapter 5. Purpose and Need.....	67
Chapter 6. Alternatives Development .....	72
Appendix A. Implementation Memorandum.....	92

## LIST OF FIGURES

Figure 1: Study Area.....	3
Figure 2: Future Land Use Plan from Horace 2045.....	4
Figure 3: All Season Trail Alignment.....	4
Figure 4: Fargo Stormwater Alignment.....	6
Figure 5: Functional Classification Relationship to Access and Mobility.....	7
Figure 6: Cross-Section Between 40th Avenue and 52nd Avenue.....	7
Figure 7: Functional Classification.....	8
Figure 8: Access Locations.....	11
Figure 9: Existing and Future Land Use.....	13
Figure 10: Water Resources.....	15
Figure 11: Sensitive Land Uses.....	19
Figure 12: Cyclist Types and Their Behavior.....	20
Figure 13: Pedestrian, Bicycle, and Transit Facilities in the Study Area.....	21
Figure 14: Pedestrian, Bicycle, and Transit Facilities.....	22
Figure 15: Area Historical Daily Traffic Volumes.....	23
Figure 16: Veterans Boulevard Hourly Traffic Volume Profiles.....	25
Figure 17: Existing Traffic Volumes.....	26
Figure 18: Crash Type and Severity.....	29
Figure 19: Northbound Traffic View at the 40th Avenue Intersection.....	30
Figure 20: Value Profile Results, Veterans Boulevard between 40th Avenue and 76th Avenue.....	34
Figure 21: Value Profile Results, Veterans Boulevard between 76 <sup>th</sup> Avenue and 100 <sup>th</sup> Avenue.....	34
Figure 22: Form and Function Survey Results, Bicycle and Pedestrian Facilities.....	35
Figure 23: Form and Function Survey Results, Cross Sections and Traffic Control.....	36
Figure 24: Form and Function Survey Results, Street Features.....	36
Figure 25: Focus Group Participants.....	37
Figure 26: Visitors to the Virtual Open House.....	40
Figure 27: Public's Value Profile.....	41
Figure 28: Visioning Survey Responses, Cross Sections and Traffic Control.....	42
Figure 29: Visioning Survey Responses, Bike and Pedestrian Facilities.....	43
Figure 30: Visioning Survey Responses, Street Features.....	43
Figure 31: Comparison of Preference Responses for Corridor Extension Alternatives.....	45
Figure 32: Comparison of Preference Responses for Deer Creek Connection Alternatives.....	46
Figure 33: Comment Type by Location.....	47
Figure 34: Preliminary Scenarios - Roadway Network Assumptions.....	51
Figure 35: Preliminary Scenarios - Traffic Forecasts.....	52
Figure 36: Additional Scenarios - Roadway Network Assumptions (Scenarios 1 thru 4).....	55
Figure 37: Additional Scenarios - Traffic Forecasts (Scenarios 1 thru 4).....	56
Figure 38: Deer Creek Connection Forecasted Traffic Volumes.....	66
Figure 39: Veterans Boulevard Southbound Transition at 40 <sup>th</sup> Avenue South.....	74
Figure 40: 180-Foot Roundabout Concept for Veterans Boulevard and 44 <sup>th</sup> Avenue South.....	75

Figure 41: 150-Foot Roundabout Concept for Veterans Boulevard and 44 <sup>th</sup> Avenue South .....	75
Figure 42: Veterans Boulevard Extension Corridor Alignment Alternatives .....	77
Figure 43: Standard Intersection Alternative Typical Section (Facing North) .....	78
Figure 44: Intersection Location and Type for the Standard Intersection Alternative.....	78
Figure 45: Veterans Boulevard and 64 <sup>th</sup> Avenue South .....	79
Figure 46: Veterans Boulevard and 76 <sup>th</sup> Avenue South .....	79
Figure 47: Veterans Boulevard and 88 <sup>th</sup> Avenue South .....	79
Figure 48: Roundabout Intersection Alternative Typical Section (Facing North) .....	80
Figure 49: Intersection Location and Type for the Roundabout Intersection Alternative .....	80
Figure 50: Intersection of Veterans Boulevard and 64 <sup>th</sup> Avenue South .....	81
Figure 51: Intersection of Veterans Boulevard and 76 <sup>th</sup> Avenue South .....	81
Figure 52: Intersection of Veterans Boulevard and 88 <sup>th</sup> Avenue South .....	81
Figure 53: Typical Section A (Facing North) .....	82
Figure 54: Typical Section B (Facing North) .....	83
Figure 55: Typical Section C (Facing North) .....	83
Figure 56: Intersection Location and Type for the Modified/Variable Alternative .....	83
Figure 57: Location and Design of Minor Intersections by Typical Section .....	84
Figure 58: Intersection of Veterans Boulevard and 64 <sup>th</sup> Avenue South .....	85
Figure 59: Intersection of Veterans Boulevard and 76 <sup>th</sup> Avenue South .....	85
Figure 60: Intersection of Veterans Boulevard and 88 <sup>th</sup> Avenue South .....	85
Figure 61, Future Bicycle and Pedestrian System Considerations.....	86
Figure 62: Location of Deer Creek Connection Alternatives.....	88
Figure 63: Deer Creek Connection Alternatives Detail .....	89

## LIST OF TABLES

Table 1: Available Right-of-Way.....	9
Table 2: PCI Quality and Ranges .....	10
Table 3: Turning Movement Count / StreetLight Data Comparison.....	24
Table 4: Intersection Capacity Level of Service Thresholds .....	27
Table 5: Existing Intersection Capacity Analysis .....	27
Table 6: Existing Crash and Severity Rate Comparison.....	28
Table 7: Focus Group Responses .....	38
Table 11: Veterans Boulevard Traffic Forecasts .....	57
Table 8: Future Build Year Scenario 3B A.M. Peak Hour Capacity Analysis .....	62
Table 9: Future Build Year Scenario 3B P.M. Peak Hour Capacity Analysis .....	62
Table 10: Future Build Year Scenario 3B Results Comparison .....	63
Table 12. Veterans Boulevard Traffic Forecasts .....	69
Table 13. Existing Crash and Severity Rate Comparison.....	71
Table 14: Planning-Level Cost Estimates .....	90

## **CHAPTER 1. EXISTING CONDITIONS**

## INTRODUCTION

As growth and development continues in the Fargo-Moorhead area's southwest metro, a continuous mile line corridor along Veterans Boulevard will be necessary to meet future transportation needs. Historically, major arterials like Veterans Boulevard attract vehicle-oriented development and thus prioritize moving vehicles quickly and efficiently. However, recent planning efforts across the metro have identified the desire and need to bring a multimodal approach to developing future corridors. Decisions regarding the form and function of the Veterans Boulevard corridor will influence investments on a series of adjacent corridors that are programmed for improvement over the next five to 10 years. These include mid-term improvements along Sheyenne Street and 45<sup>th</sup> Street and longer-term improvements along both 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South. Significant additional local, state, and federal funds are anticipated to be allocated to these corridors and have the potential to rebalance projected system-wide needs.

## STUDY AREA AND BACKGROUND

This study will evaluate the existing segment of Veterans Boulevard between 40<sup>th</sup> Avenue and 52<sup>nd</sup> Avenue South, and the potential for a phased extension from 52<sup>nd</sup> Avenue to 100<sup>th</sup> Avenue South. A map of the study area can be seen in Figure 1. The study will also evaluate five existing intersections along the corridor:

- » Veterans Boulevard and 40<sup>th</sup> Avenue South
- » Veterans Boulevard and 44<sup>th</sup> Avenue South
- » Veterans Boulevard and 48<sup>th</sup> Avenue South
- » Veterans Boulevard and 51<sup>st</sup> Avenue South
- » Veterans Boulevard and 52<sup>nd</sup> Avenue South

## Previous Studies

Several planning efforts are underway or have been completed that interact with the Veterans Boulevard study area. This section highlights relevant background information and existing plans for land use and the transportation network along the corridor. These planning efforts provide a basis to ensure that the Veterans Boulevard corridor is consistent with existing plans for the surrounding area.

### *2045 Fargo-Moorhead Metropolitan Transportation Plan*

Adopted in 2019, the 2045 Fargo-Moorhead Metropolitan Transportation Plan is a collaborative effort of the Fargo-Moorhead Council of Governments (COG) and its member jurisdictions. The plan is a performance-based document that used systems information to inform investment and policy decisions towards national performance goals. Extensive public engagement was conducted to build community awareness and develop a community vision for the future transportation system. The plan identifies Veterans Boulevard as one of two primary future corridor studies, and recognizes the need to determine items like constructability, cost, access, and bicycle and pedestrian treatments in the corridor. As of 2019, the cost estimate for the Veterans Boulevard roadway extension from 52<sup>nd</sup> Avenue to 64<sup>th</sup> Avenue was estimated around \$7.5 million with a proposed three-lane roadway. Beyond explicit mentions of Veterans Boulevard, this document provides regional transportation goals and performance measurement requirements that will inform the Veterans Boulevard planning process.

Figure 1: Study Area

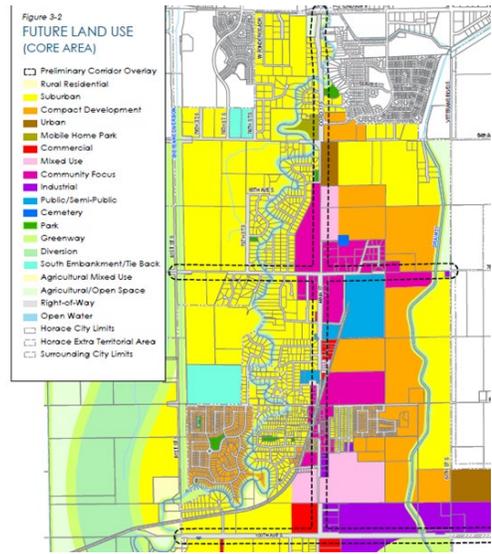


## Horace 2045

The Horace Comprehensive and Transportation Plan (Horace 2045) presents a long-range vision for future zoning, transportation, infrastructure, and land use related decisions in Horace. The City’s jurisdiction on the eastern edge is bordered by Veterans Boulevard between 64<sup>th</sup> Avenue and 100<sup>th</sup> Avenue. Between those cross streets, the existing land use to the west of Veterans Boulevard is Agricultural/Open Space. While an implementation timeline was not provided, the plan illustrates a vision for future land use along the corridor, listed below.

- » Agricultural/Open Space between 64<sup>th</sup> Avenue and 76<sup>th</sup> Avenue
- » Suburban Residential from 76<sup>th</sup> Avenue to half a mile south of 88<sup>th</sup> Avenue (one to three units per acre)
- » Compact Residential Development from half a mile south of 88<sup>th</sup> Avenue to three-quarters of a mile south of 88<sup>th</sup> Avenue (three to five units per acre)
- » Urban Residential from half a mile south of 88<sup>th</sup> Avenue to three-quarters of a mile south of 88<sup>th</sup> Avenue (five to 14 units per acre)
- » Industrial from a quarter mile north of 100<sup>th</sup> Avenue to 100<sup>th</sup> Avenue

Figure 2: Future Land Use Plan from Horace 2045

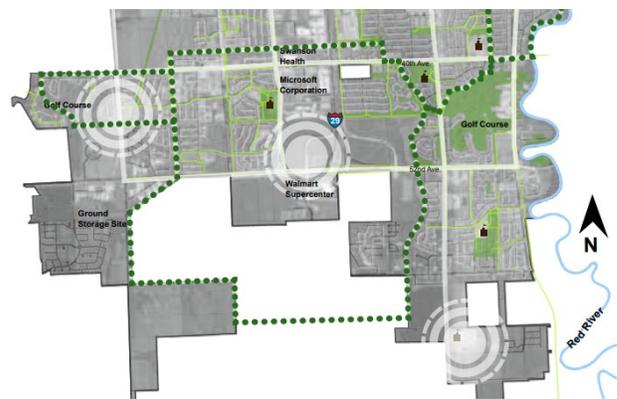


The plan recommends classifying the future Veterans Boulevard between 64<sup>th</sup> Avenue and 100<sup>th</sup> Avenue as a “mixed-use arterial”. This road type carries higher levels of vehicular traffic, has a 35 mile per hour maximum speed limit, on-street parking, pedestrian crossings at signals or median-protected locations, and driveways spaced 300 to 400 feet apart.

## Fargo’s Go 2030 Comprehensive Plan

Fargo’s comprehensive plan, published in 2012, aims to represent the community’s vision for the future of Fargo. Within that vision, community input was used to establish a list of priorities for different topics. For transportation, the top three priorities for improvements were Bicycle/Pedestrian Infrastructure, Complete Streets, and Transit Improvements. This plan also identified the stretch of Veterans Boulevard between 40<sup>th</sup> Avenue and 52<sup>nd</sup> Avenue as a future Active Living Street, which includes infrastructure to support pedestrians, cyclists of all abilities, transit, and automobiles. Along 40<sup>th</sup> Avenue, the map shows an All-Season City-Wide Trail Loop crossing over Veterans Boulevard and running along Drain 27.

Figure 3: All Season Trail Alignment



### *Southwest Metro Transportation Plan*

The Southwest Metro Transportation Plan assessed future right-of-way and capacity needs of the roadway system where Fargo and Horace will grow together, south of 52<sup>nd</sup> Avenue. The Veterans Boulevard extension to 100<sup>th</sup> Avenue was studied under two scenarios, and found not to be a critical improvement, as north/south volumes could be accommodated on other roadways. This plan evaluated two scenarios:

- » The first scenario assumed aggressive population growth in the City of Horace requiring Veterans Boulevard to be a four-lane arterial between 52<sup>nd</sup> Avenue and 76<sup>th</sup> Avenue and a two-lane arterial between 76<sup>th</sup> Avenue and 100<sup>th</sup> Avenue. It was found that the Veterans Boulevard extension under these conditions would reduce congestion on several adjacent linkages.
- » The second scenario would take the corridor off the section line and place it at approximately the quarter section line. Under this alignment, the roadway would intersect with 52<sup>nd</sup> Avenue South between Drain 27 and 45<sup>th</sup> Street South and would not allow for connectivity with Veterans Boulevard north of 52<sup>nd</sup> Avenue South. Ultimately, the report indicates that congestion relief as a result of the extension would not offset the need and cost of constructing capacity improvements to other corridors.

### *Fargo/West Fargo Parking and Access Study*

The purpose of this Parking and Access study was to analyze how parking and access management plays a role in site development and transportation network efficiency, and how modifications to both access and parking regulations can achieve the goals of Metro COG, Fargo, and West Fargo. This study aimed to develop guidelines that encourage a comfortable walking and biking experience, complement land use form, reduce the need for excess off-street parking, and enable sustainable development patterns. This study recommended classifying Veterans Boulevard between 40<sup>th</sup> Avenue and 52<sup>nd</sup> Avenue as a “residential collector”. This road type carries a moderate level of vehicular traffic, has a 25 mile per hour maximum speed limit, on street parking, crosswalks, roundabout intersections, and driveways spaced 50 to 100 feet apart.

### *Fargo Public Art Master Plan*

In 2015, the City of Fargo established the Arts and Culture Commission to make recommendations to the City Commission regarding public art investments and encourage participation in public art by citizens, developers, and property owners. The Fargo Public Art Master Plan developed a framework for a sustainable public art program and a vision of Fargo as a cultural hub and destination. While Veterans Boulevard is not directly referenced in the plan, Drain 27 is identified as an opportunity to create an identity for the developing Osgood neighborhood. The plan recommended planting wetland and prairie plants in stormwater ditches.

### *76<sup>th</sup> Avenue South Corridor Study*

The purpose of this study is to identify transportation improvement projects that consider all transportation aspects for all modes of transportation. Two alternative designs were explored for 76<sup>th</sup> Avenue South between 81<sup>st</sup> Street South and Orchard Park Drive: a Regional Arterial and a Commercial Arterial corridor.

- » The Regional Arterial vision has an undetermined intersection control type at the corner of 76<sup>th</sup> and Veterans Boulevard.
- » The Commercial Arterial would include a signalized light at the same corner.

In addition to considering future roadway capacity needs, functional classification, and access management along the corridor, this project aims to phase transportation improvements such that future growth is accommodated as it occurs.

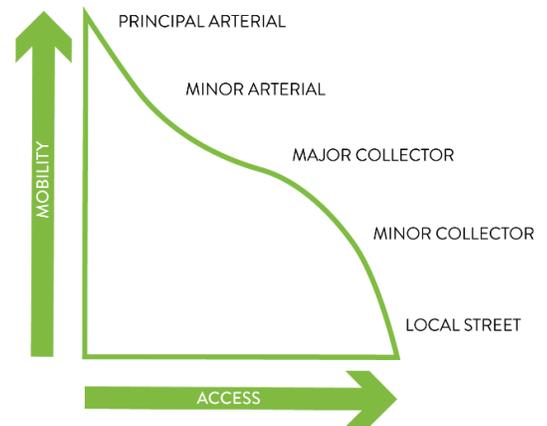


## INFRASTRUCTURE CONDITION

### Functional Classification

Roadways must balance access and mobility. The function of the roadway is dependent on its classification; an interstate or freeway prioritizes mobility and has very strict access controls allowing for high speed, while a local road prioritizes access over mobility, as shown in Figure 5. Most travel involves movement through a network of roads and the functional classification system defines the role that any road or street plays in serving the flow of trips through an entire network. Additionally, roadways that have a functional classification are tied to the Federal Aid and State Aid highway system, making them eligible for funding from federal and state governments. Figure 7 shows the functional classification of the roadways around the corridor.

Figure 5: Functional Classification Relationship to Access and Mobility



### Corridor Function and Connecting Roadways

The Veterans Boulevard corridor between 40<sup>th</sup> Avenue and 52<sup>nd</sup> Avenue is currently unclassified as Metro COG and NDDOT have not updated their functional classification maps since 2007. However, an update is in progress and Veterans Boulevard is anticipated to be classified as a minor arterial. Different planning documents have identified the corridor’s function differently with the Horace Comprehensive and Transportation Plan and Southwest Metro Transportation Plan identifying the corridor as an arterial, while the Parking and Access Study and Go 2030 prioritized bicycle and pedestrian amenities on this corridor. Through the technical analysis and public engagement, the corridor’s vision will ultimately be determined. This vision will guide the alternatives analysis and prioritization process.

### Typical Sections

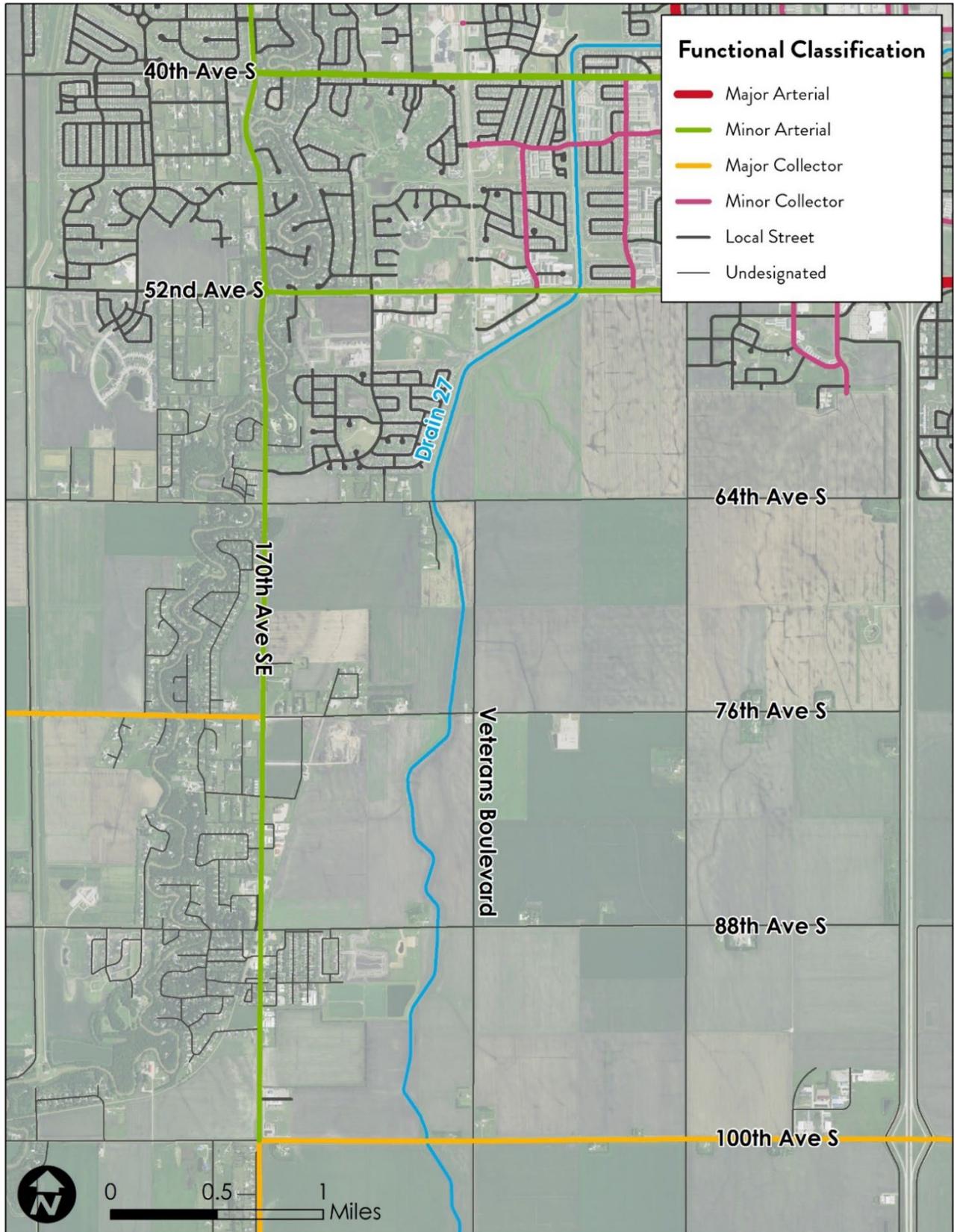
The Veterans Boulevard Corridor study area has two distinct cross-sections.

- » Veterans Boulevard between 40<sup>th</sup> Avenue and 52<sup>nd</sup> Avenue is a divided two-lane roadway with turn lanes in both directions, a median, and separated shared-use paths running parallel to the road in both directions. Roundabouts control the intersections at 44<sup>th</sup> Avenue South, 47<sup>th</sup> Avenue South, and 51<sup>st</sup> Avenue South.
- » Veterans Boulevard between 52<sup>nd</sup> Avenue South and 100<sup>th</sup> Avenue South is an unpaved rural road with no markings and no pedestrian/bicycle infrastructure.

Figure 6: Cross-Section Between 40th Avenue and 52nd Avenue



Figure 7: Functional Classification



## Right-of-Way

Right-of-way (ROW) is the available space owned by the jurisdiction on which the roadway and associated utilities reside. ROW is often a constraining factor in developing alternatives, because acquiring additional ROW can be costly, increase project delivery deadlines, or stop a project altogether. ROW widths vary along the corridor, depending on the location as shown in Table 1. Areas south of Drain 27 see less ROW because the parcels have not gone through the platting process where the ROW dedication would occur. Instead, they are subject to the North Dakota Century Code’s statutory right-of-way, which dedicates 33 feet from a section line in both directions as the statutory right-of-way. Determining the Veterans Boulevard corridor’s ROW needs and alignment will occur during this planning process and will be applied as parcels undergo the subdivision process.

Table 1: Available Right-of-Way

Segment of Veterans Boulevard	Right-of-Way (feet)
40 <sup>th</sup> Avenue South to 52 <sup>nd</sup> Avenue South	151
52 <sup>nd</sup> Avenue South to Drain 27	133
Drain 27 to 64 <sup>th</sup> Avenue South	66*
64 <sup>th</sup> Avenue South to 94 <sup>th</sup> Avenue South	66*
94 <sup>th</sup> Avenue South to 100 <sup>th</sup> Avenue South	66*

\*Indicates no dedicated ROW, but the minimum statutory ROW applies.

## Utilities

There are a variety of City of Fargo public utilities, including water, sanitary sewer, storm sewer, and fiber optic cable, along and across the Veterans Boulevard corridor between 40<sup>th</sup> Avenue and Drain 27. South of Drain 27, there are no identified public utilities. There are private overhead utilities along the west side of Veterans Boulevard to Drain 27 and continues to follow the section line south of the drain. Further discussion with the City of Fargo and City of Horace will be required to determine potential future utility needs. As any project is programmed additional coordination with any private utilities should be considered.

## Lighting

Roadway lighting is a proven safety improvement. Research has found roadway lighting can reduce all crashes up to 30 percent, fatal crashes by 43 percent and nighttime crashes by 50 percent. NDDOT has a lighting warrant policy that provides six criteria to justify roadway lighting. The most relevant criteria include sections where curb and gutter are present on at least one side of the roadway and sections where there is substantial development present on both sides and daily traffic exceeds 1,000 vehicles per day.

- » The current segment of Veterans Boulevard has high pressure sodium lighting in the raised median.
- » The lighting of the future segment of Veterans Boulevard will meet lighting criteria, with specific lighting to be determined during project development.

Meeting these criteria does not require the City of Fargo or NDDOT to install roadway lighting. A full roadway lighting analysis would be required during project development phases.

## Pavement Conditions

Timely pavement rehabilitation has the potential to be six to 14 times more cost-effective than rebuilding a deteriorated road. Poor pavement conditions add nearly \$600 to the annual cost of car ownership due to damaged tires, suspension, reduced fuel efficiency, and accelerated vehicle depreciation.

The City of Fargo maintains a Pavement Condition Index (PCI) database for all major roads in the city. PCI considers multiple factors, including pavement distress and smoothness of the ride. Table 2 shows the PCI ranges and the estimated time to improvements. The Veterans Boulevard corridor from 40<sup>th</sup> Avenue to 52<sup>nd</sup>

Avenue was most recently constructed in 2009 and sees PCIs of 95 and above. This segment of roadway is unlikely to need pavement maintenance in the near future, unless roadway conditions deteriorate more quickly than anticipated.

Table 2: PCI Quality and Ranges

PCI Quality	PCI Range	Time Until Improvement Needed
Good	86 to 100	No improvements needed in near future.
Satisfactory	71 to 85	6 to 10 years.
Fair	56 to 70	1 to 5 years.
Poor	41 to 55	Rehabilitate as soon as possible.
Very Poor	25 to 40	Reconstruct as soon as possible.
Serious	10 to 24	Reconstruct as soon as possible.
Failed	Less than 10	Reconstruct as soon as possible.

## Access Management

Access management is the process of balancing the competing needs of traffic movement and land access. Access points introduce conflict and friction into the traffic stream. Allowing dense, uncontrolled access spacing results in safety and operational deficiencies for vehicles and can reduce bicycle and pedestrian comfort and safety.

- » Every unsignalized driveway increases the corridor crash rate by approximately two percent.
- » Roadway speeds are reduced an average of 2.5 miles per hour for every ten access points per mile.

The Fargo Land Development Code provides roadway access and driveway guidelines based on a roadway classification. For minor arterials, driveways must be shared wherever possible and there must be a minimum spacing of 600 feet between driveways and intersections. These guidelines are less stringent for collector roadways, permitting driveways every 150 feet to 300 feet.

Veterans Boulevard is highly access controlled, with only one uncontrolled driveway between 40<sup>th</sup> Avenue and 52<sup>nd</sup> Avenue. South of 52<sup>nd</sup> Avenue, there are two uncontrolled driveways. Figure 8 shows the existing access points.

Figure 8: Access Locations



## ENVIRONMENTAL CONDITIONS

The existing environmental conditions, or affected environment, are the baseline conditions in a given area. Environmental conditions have the potential to constrain the development of build alternatives and/or be impacted by build alternatives. Development of build alternatives for a project is based on the purpose and need for the project and environmental constraints associated with the area. This section contains an overview of pertinent environmental conditions that could affect alternatives development for the Veterans Boulevard study area between 40<sup>th</sup> Avenue and 100<sup>th</sup> Avenue. A desktop assessment of the corridor was completed using a variety of federal, state, and local resources to identify potential environmental constraints and impacts that projects along the corridor could encounter. Alternatives developed at the planning level could be transitioned into an environmental document pursuant to the National Environmental Policy Act (NEPA) (42 U.S.C. §4321 et seq.). As project alternatives are developed and refined, this assessment of impacts will also become more refined.

### Land Use

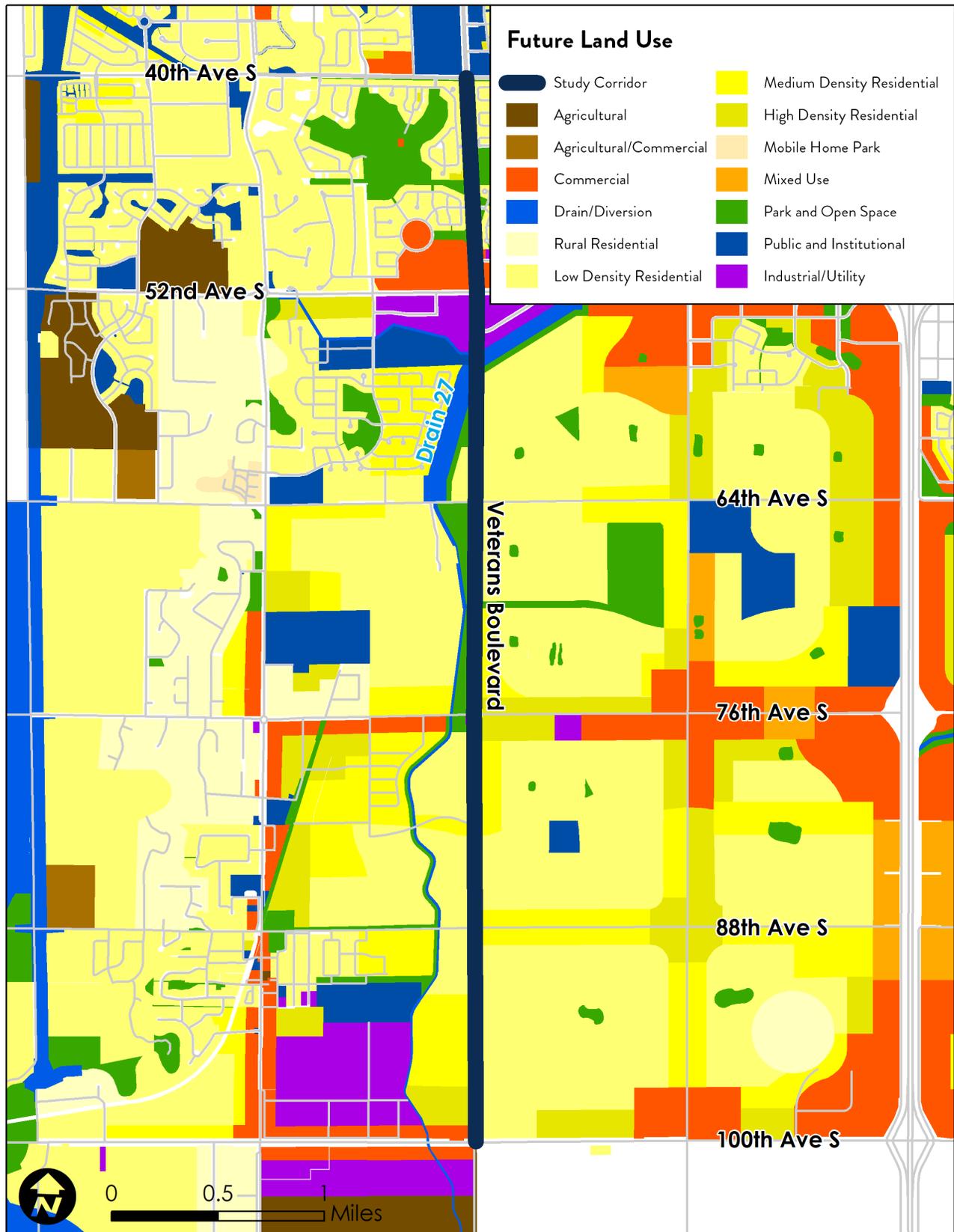
Land use can have many implications on the characteristics of a neighborhood and the efficiency of its transportation network. For example, a primarily industrial neighborhood will have peak traffic flows often associated with shift work and must accommodate heavy truck movements whereas a residential neighborhood will have strong peaking and directional characteristics as people leave to and return from work.

The northern portion of the corridor is developed, primarily characterized by single-family dwellings and commercial space with some public areas and agricultural land. The southern portion of the corridor is primarily agricultural/vacant, with a few rural residential parcels and one industrial parcel (electrical substation). Horace 2045 identifies future land uses along the corridor in their jurisdiction as agricultural/open space, industrial, suburban, compact development, and urban. Fargo's Go 2030 Comprehensive Plan identifies the corridor as an active living street (multi-modal transportation corridors with attractive streetscapes that connect major activity centers) from north of the study area to 52<sup>nd</sup> Avenue with a neighborhood center (walkable housing mixture with services, schools, and parks) between 40<sup>th</sup> Avenue and 52<sup>nd</sup> Avenue. Zoning along the corridor south of Drain 27 is primarily low density residential with higher density and commercial/mixed-use nodes around major intersections. Travel modeling completed for this study was based on a future land use plan for the City of Fargo which varies slightly from that shown in Figure 9. This deviation is considered inconsequential from a long-range planning perspective.

### Hazardous Waste Sites

The Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation, and Liability Act regulate hazardous waste sites. A review of North Dakota Department of Environmental Quality General Environmental Incidents revealed four Environmental Incident Reports within the sections that the project corridor intersects. However, based on reported addresses, none of the incidents occur within 200 feet of the corridor. Unreported contamination or other hazardous materials/waste (e.g., lead, asbestos) could still be present along the assessment corridor. Surveys should be conducted to identify contaminated materials or other hazardous materials/waste in structures that would be impacted so that any identified regulated materials/waste can be handled and disposed of according to state and federal law.

Figure 9: Existing and Future Land Use



Prior to right-of-way (ROW) acquisition, large scale earthwork, groundwater dewatering, or work in commercial or industrial areas, surveys (e.g., Phase I and/or Phase II Environmental Site Assessment) should be conducted to identify contaminated properties so that liability and cost risk can be assessed.

### Social/Economic

All transportation projects have some level of associated social and economic impacts. In general, projects aimed at improving transportation corridors have beneficial overall social and economic impacts. Temporary social and economic impacts could occur during construction activities as a result of reduced mobility through construction zones. Existing roadway ROW varies along the corridor and constrained by existing development in some areas. Improvements along the corridor may require acquisition of ROW and/or temporary easements. Coordination with landowners and/or residents would be required for any acquisitions, access changes, or relocations in accordance with state and federal law, including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

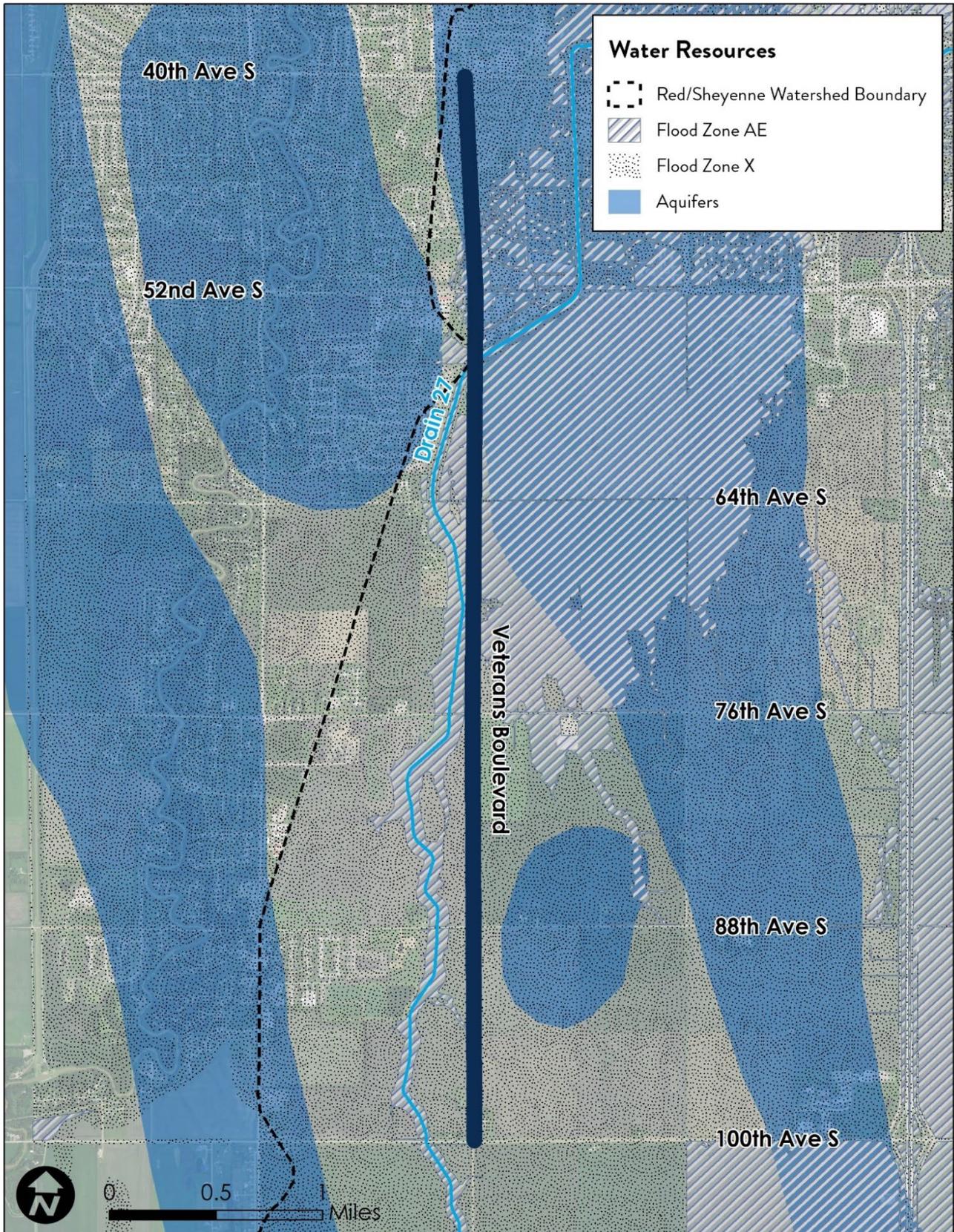
### Environmental Justice

Measures must be taken to avoid disproportionately high, adverse impacts on minority or low-income communities in accordance with Executive Order (EO) 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Minority populations, as defined in Metro COG's Title VI Non-Discrimination Plan, are census blocks with minority populations (i.e., American Indian or Alaskan Native; Asian; Black, or African American; Hispanic, or Latino; Native Hawaiian or Other Pacific Islander) equal or greater than 25 percent of the total block population. The Plan utilizes a \$23,403 annual median household income as the threshold for low income block groups based on the US Department of Health and Human Service poverty guidelines. As defined, there are no minority or low-income populations along the corridor that constitute environmental justice populations.

### Water Resources

Water resources generally include lakes, rivers, streams, wetlands, floodplains, and groundwater. The corridor occurs on the west edge of the City of Fargo – Red River Watershed, except for a narrow point where the City of West Fargo – Sheyenne River Watershed extends into the corridor between Drain 27 and the existing southern terminus of Veterans Boulevard. According to the US Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI), surface water in and around the corridor consists of Drain 27 and connecting agricultural drainages, and a few palustrine emergent wetland basins. Given the proximity and/or connection to Drain 27, a tributary of the Red River and Sheyenne Rivers, it is likely that all aquatic resources along the corridor are under the jurisdiction of the US Army Corps of Engineers. Therefore, projects affecting these resources would require a Section 404 Clean Water Act Permit. A field aquatic resources delineation should be conducted prior to any project along the corridor to identify the exact boundary and nature of all such resources so direct impacts can be avoided and minimized to the extent practicable. Potential indirect impacts on surface water during any project construction activities should be minimized by implementing erosion and stormwater best management practices.

Figure 10: Water Resources



Floodplains constitute land situated along rivers and their tributaries that are subject to periodic flooding with a one percent chance of being flooded in any given year, on the average interval of 100 years or less. The entire corridor between 48<sup>th</sup> Avenue and 76<sup>th</sup> Avenue occurs within such a special flood hazard area (Zone AE) or other flood area (Zone X – shaded<sup>1</sup>). The special flood hazard area would be significantly reduced upon completion of the Fargo-Moorhead Area Diversion Project but would still be present along Drain 27 and connecting drainages. EO 11988 - Floodplain Management requires federal agencies to take actions to reduce the risk of flood losses and flood impacts on human safety, health, and welfare, whenever possible. Pursuant to EO 11988, potential effects on floodplains must be evaluated and alternatives that avoid adverse effects and incompatible development in floodplains must be evaluated. If it is found that the only practicable alternatives require siting in a floodplain, it is necessary to design or modify the project to minimize potential harm to or within the floodplain. The North Dakota Floodplain Management Act of 1981 stipulates that the 100-year base flood elevations cannot be increased because of the proposed project. These flood protection measures are to be applied to new construction or rehabilitation. Projects within Floodways or Special Flood Hazard Areas identified on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) are required to obtain permits from local floodplain administrators.

Sole-source aquifers are groundwater supplies that provide the only source of drinking water for a particular area. These aquifers are protected under the Safe Drinking Water Act of 1974 (Public Law 93-523, 42 U.S.C. 300 et. seq). There are no sole-source aquifers designated in North Dakota. Wellhead protection areas are delineated by the North Dakota Department of Environmental Quality to define and assess the source waters of public water systems in accordance with the Safe Drinking Water Act. There are no active wellhead protection areas along the corridor. The entire corridor is located above the West Fargo Aquifer, a shallow aquifer with a medium monitoring score on the State's Geographic Targeting System, indicating a moderate groundwater pollution potential. Roadway construction and operation along the corridor are not likely to directly or indirectly (e.g., alteration of groundwater recharge, contamination) impact groundwater resources, though care should be taken to avoid, minimize, and clean up spills of hazardous materials.

### Threatened and Endangered Species

Wildlife and their habitat are protected by several laws, including the Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act and the Endangered Species Act. Plant species are also afforded protection under the federal and state Endangered Species laws. Most birds in North Dakota are protected as migratory species and the corridor occurs within the range of the bald eagle. The following resources protected by the Endangered Species Act occur within Cass County: whooping crane and the northern long-eared bat.

Developed portions of the corridor are unlikely to provide suitable habitat for the whooping crane or northern long-eared bat. Rural cropland and wetlands may provide stopover habitat for the whooping cranes; however, the species is known to avoid human development and activity. Trees and structures provide roosting habitat for the northern long-eared bat. Trees are scarce along the corridor, making it unlikely habitat for the northern long-eared bat. Coordination with the North Dakota Game and Fish Department, North Dakota Parks and Recreation Department (Natural Heritage Inventory), and US Fish and Wildlife Service for projects along the corridor should occur to ensure compliance with applicable regulations.

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<sup>1</sup> Area with a 0.2% annual chance flood; areas with 1% annual chance of flood with average depths of less than 1 foot or with drainage less than 1 square mile; and areas protected by levees from 1% annual chance of flood.

## Noise

Noise is generally defined as unwanted sound, and can be intermittent or continuous, steady or impulsive, stationary or transient. Noise levels discernible by humans and animals are dependent on several variables, including distance and ground cover between the source and receiver and atmospheric conditions. Perception of noise is affected by intensity, frequency, pitch, and duration. Noise levels corresponding to human hearing are quantified by A-weighted decibels (dBA).

Transportation projects having Federal Highway Administration (FHWA) involvement may require a noise analysis in accordance with Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR 772) for “Type 1” projects. Such projects include new construction, substantial alteration of horizontal and/or vertical alignment, addition of through-traffic lanes (including restriping). The first step in a noise analysis is assessing activity categories within 500 feet of a project to identify sensitive noise receptors (i.e., areas of frequent human use). A computer model is then used to determine whether traffic noise impacts are anticipated and if noise abatement (e.g., implementation of noise barriers) is necessary.

Sensitive noise receptors include land uses such as houses, apartments, recreation areas, offices, schools, medical facilities, libraries, places of worship, restaurants, and other areas where quiet is important. Several sensitive noise receptors presently occur along the corridor, such as residences, Sheyenne High School, Osgood Elementary, Veterans Park, Osgood Golf Course, and recreational shared-use paths. Future development and areas permitted for development at the time of the noise analysis should also be assessed for sensitive noise receptors.

## Historic and Archeological Preservation

Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) requires that federal agencies consider the effects of their undertakings on historic properties. A historic property is any prehistoric or historic district, site, building, structure, or object included on, or eligible for inclusion on, the National Register of Historic Places (NRHP). The Section 106 review process is defined in regulations promulgated by the Advisory Council on Historic Preservation (ACHP), “Protection of Historic Properties” (36 CFR Part 800). There are no publicly listed historic properties on the NRHP along the corridor; however, confidential historic properties or historic properties that have yet to be identified may be present. Any project along the corridor should include a review of State Historic Preservation Office (SHPO) records, field cultural resources inventory, and coordination with the SHPO to ensure all historic properties are identified and properly handled.

## Section 4(f) Resources

Section 4(f) of the Department of Transportation Act (23 U.S.C. 138) prohibits federal transportation agencies from approving the use of significant public parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless no feasible and practicable avoidance alternative exists. If such an avoidance alternative is not available, only the alternative with the least harm, including all possible planning to minimize harm, can be approved. Section 4(f) may be applicable to existing properties along the corridor, such as Sheyenne High School, Osgood Elementary, Veterans Park, and recreational shared-use paths. In addition, sites determined to be on or eligible for listing on the NRHP that may be identified during project-specific surveys and coordination would be protected by Section 4(f).

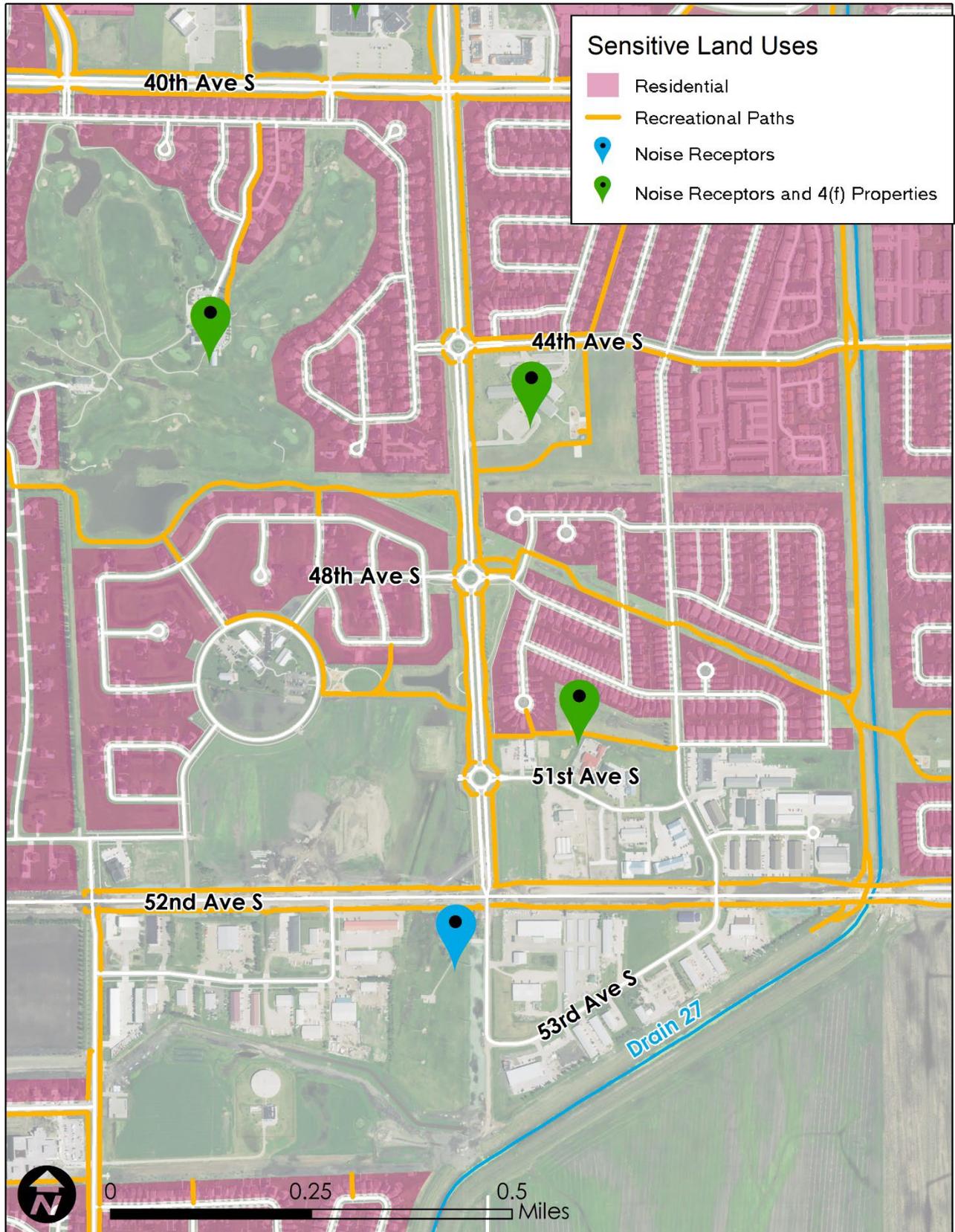
Should projects along the corridor include FHWA involvement, the FHWA would need to determine which properties Section 4(f) applies to and can only approve the project alternative(s) that avoid Section 4(f) resources if any such alternatives exist. If no feasible and prudent avoidance alternative exists, coordination with

the official(s) with jurisdiction over the affected Section 4(f) resource(s) would be required to minimize and mitigate for impacts and identify the alternative(s) with least harm. Any Section 4(f) approval by the FHWA would require the appropriate coordination and documentation (e.g., Section 4(f) evaluation) efforts.

### Section 6(f) Resources

Section 6(f) of the Land and Water Conservation Act requires that the conversion of lands or facilities acquired with Land and Water Conservation Funds (LWCF) be coordinated with the Department of Interior through the North Dakota Parks and Recreation Department (NDPRD). When such a conversion occurs, replacement in-kind is typically required. According to the NDPRD's North Dakota LWCF Project and Grant Listing (1965-2015), several projects within Fargo, West Fargo, and Horace have received LWCF funding. To date, is not anticipated that any of these facilities are along the corridor. However, NDPRD should be consulted to identify any recently funded facilities that may be present.

Figure 11: Sensitive Land Uses



## MULTIMODAL CONDITIONS

### Benefits to Complete Streets

Enhancing the ability of people to walk and bike involves providing adequate infrastructure and linking urban design, streetscapes, and land use to encourage walking and biking. Designing roadways to accommodate all types of users is commonly termed “complete streets” which come with many benefits:

- » Streets designed with sidewalks, raised medians, traffic-calming measures and treatments for travelers with disabilities improves pedestrian safety. Sidewalks alone reduce vehicle-pedestrian crashes by 88 percent.
- » Multiple studies have found a direct correlation between the availability of walking and biking options and obesity rates. The Centers for Disease Control and Prevention recently named adoption of complete streets policies as a recommended strategy to prevent obesity.
- » Complete streets offer inexpensive transportation alternatives. A recent study found that most families spend far more on transportation than food. In 2010, Metro COG adopted a Complete Streets Policy Statement which encourages and guides local jurisdictions in considering all modes of transportation during planning, design, construction, and operation of local roadways.
- » Research has found that people who live in walkable communities are more likely to be socially engaged and trusting than residents living in less walkable communities.

Complete streets does not mean that all modes should be accommodated on all roads. Instead, communities should look to create a comprehensive network of facilities that similarly serve all modes of transportation. In 2010, Metro COG adopted a Complete Streets Policy Statement which encourages and guides local jurisdictions in considering all modes of transportation during planning, design, construction, and operation phases of local roadway corridors.

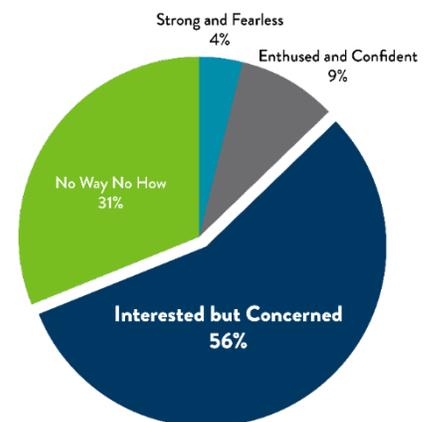
### Types of Cyclists

National research has found that there are generally four levels of interests/abilities when it comes to cycling.

- » Strong and Fearless riders are those that are very comfortable without bike lanes. They will ride under most roadway and traffic conditions.
- » Enthused and Confident riders will ride their bikes with appropriate infrastructure.
- » Interested but Concerned riders are interested in biking more but are not comfortable with the infrastructure or have other barriers to biking.
- » No Way No How are unable or uninterested in bicycling and no change to the environment or infrastructure is likely to encourage them to cycle more.

Nearly three-quarters of Strong and Fearless, Enthused and Confident, and Interested but Concerned cyclists had ridden at least once in the last 30 days for transportation or recreation. Improving infrastructure and the environment can help encourage these three types of cyclists to choose bicycling more.

Figure 12: Cyclist Types and Their Behavior



### Generators

Multimodal generators are places that people would walk or bike to. Along Veterans Boulevard, there are a variety of generators, where high-quality bicycle, pedestrian, and transit amenities should be considered.

- » Schools and Parks like Sheyenne High School, Osgood Elementary, Veterans Park
- » Restaurants, retail, and job centers including Papa Murphy’s, Dominos, and Dakota Boys Ranch
- » Fitness facilities like CrossFit, Dynasty Performance, and Edge Fitness

## Existing Facilities

### *Bicycle and Pedestrian Facilities*

Along the existing Veterans Boulevard corridor, there is a shared-use path on the east side of the corridor and a sidewalk on the west side from 40<sup>th</sup> Avenue to 52<sup>nd</sup> Avenue. There are no facilities south of 52<sup>nd</sup> Avenue.

There are marked crosswalks at 40<sup>th</sup> Avenue, 44<sup>th</sup> Avenue, 48<sup>th</sup> Avenue, and 52<sup>nd</sup> Avenue. Many of these crossings also include a refuge island so pedestrians only need to cross one direction of traffic at a time.

In addition to the facilities that run alongside Veterans Boulevard, there are east-west shared-use paths that connect to the Veterans Boulevard facilities between 44<sup>th</sup> Avenue and 48<sup>th</sup> Avenue. There are no crossing facilities at this location, but it was identified in the Safe Routes to School as a location for improved crossing facilities, given its proximity to Osgood Elementary.

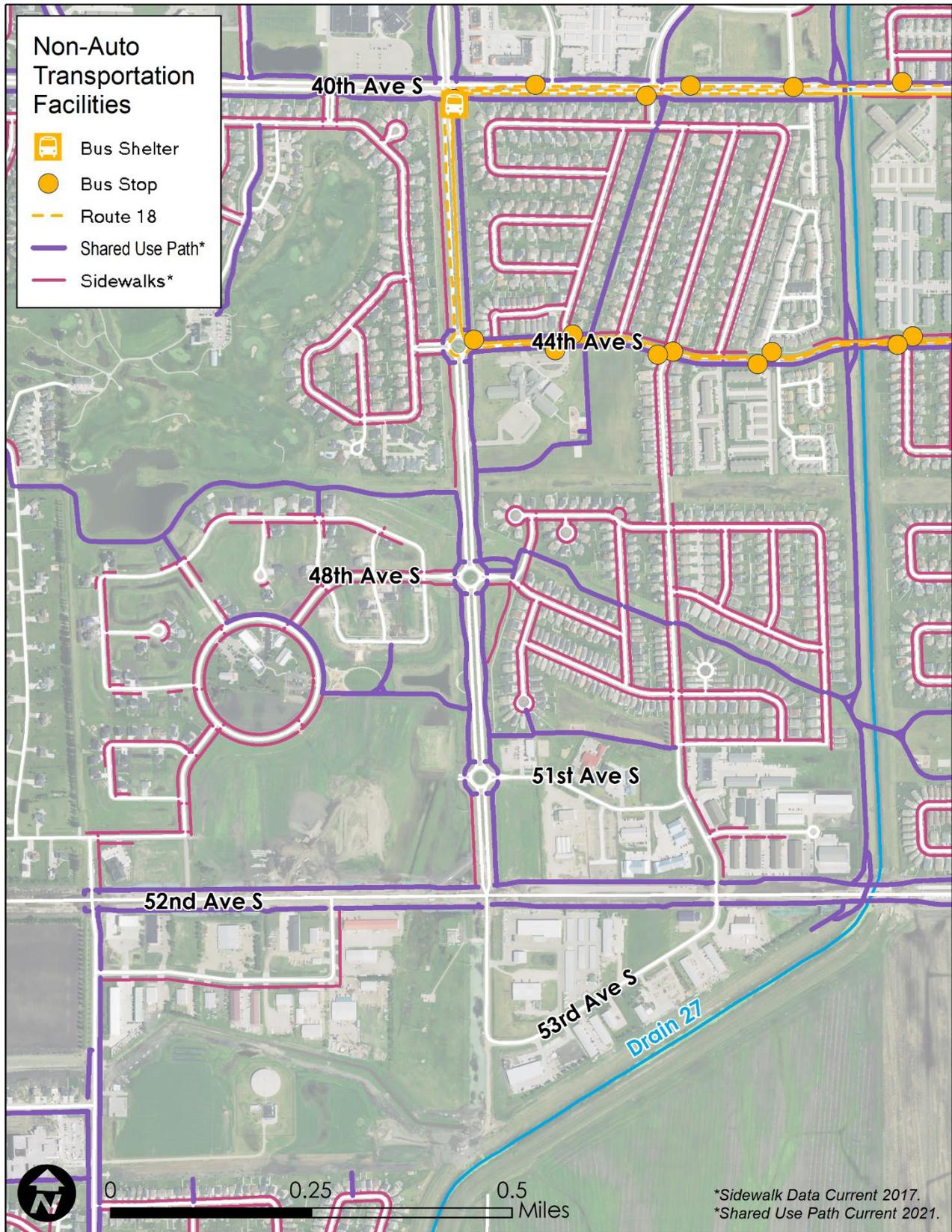
### *Transit Facilities*

The Fargo-Moorhead area, including Fargo, West Fargo, Moorhead, and Dilworth, is served by Metro Area Transit of Fargo-Moorhead (MATBUS). Currently, 16 fixed routes serve the metro area, with Route 18 serving the study area. Route 18 runs on an hourly schedule between 6 AM to 10:15 PM with dedicated stops at the corner of 40<sup>th</sup> Avenue and 44<sup>th</sup> Avenue.

Figure 13: Pedestrian, Bicycle, and Transit Facilities in the Study Area



Figure 14: Pedestrian, Bicycle, and Transit Facilities



## VEHICLE TRAFFIC CONDITIONS

### Data Collection

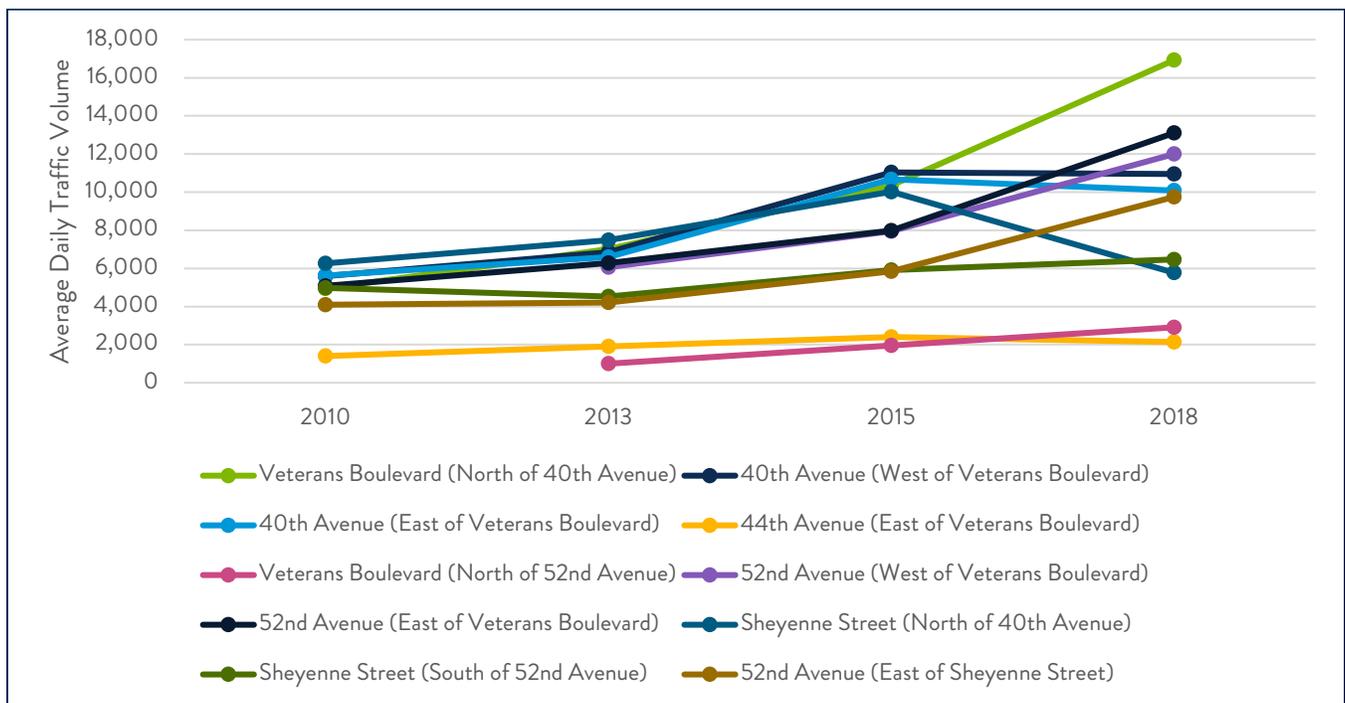
Typically, data collection for a corridor study would involve collecting the most recent traffic data, including daily traffic volumes and turning movement counts. However, this corridor study is being conducted during the COVID-19 pandemic, which has impacted normal travel patterns. Additionally, there has been a significant amount of construction within the area, including 52<sup>nd</sup> Avenue in 2019 and portions of Sheyenne Street in 2018 and 2019. To ensure the most accurate data possible, a combination of data sources was reviewed:

- » Historical average daily traffic (ADT) volumes provided by the NDDOT.
- » 2018 intersection (Miovision) turning movement counts collected by the NDDOT (at three non-study intersections).
- » StreetLight user data, which includes navigation-GPS data and location-based services (LBS) data. This data was used to calibrate the existing conditions and ensure typical (non-COVID-19) conditions are represented.

### Daily Volumes

Based on an initial review of area historical ADT volumes, as shown in Figure 15, there was a significant increase in traffic volumes along Veterans Boulevard (north of 40<sup>th</sup> Avenue), as well as along 52<sup>nd</sup> Avenue. In conjunction, there was a significant decrease in 2018 ADT volumes along Sheyenne Street. These travel pattern shifts are most likely related to the roadway construction along Sheyenne Street that occurred in 2018 and appear to have changed travel patterns within the study area. Therefore, ADT traffic volumes were modified based on historical growth trends to identify year 2020 non-COVID-19 conditions.

Figure 15: Area Historical Daily Traffic Volumes



## Intersection Turning Movements

To develop intersection turning movement counts, historical counts from the NDDOT and StreetLight data was used. The following information provides an overview of the validation process and subsequent data, which is consistent with guidance from the Institute of Transportation Engineers (ITE) regarding data collection during a pandemic.

- » StreetLight data was pulled for Tuesdays, Wednesdays, and Thursdays from November 2019 through February 2020. This allows for a direct comparison against NDDOT intersection turning movement counts. This comparison data is summarized in Table 3.
- This data was chosen since the 52<sup>nd</sup> Avenue project was substantially completed by this time and travel patterns had normalized.
- The single day comparison indicates that validating turning movement count proportions to a single day is not ideal for StreetLight, although relatively similar.
- The larger dataset (November 2019 through February 2020) falls more in line with the observed turning movement count proportions (+/- five percent for most movements).

Table 3: Turning Movement Count / StreetLight Data Comparison

45th Street and 40th Avenue	45th Street (Southbound)			40th Avenue (Westbound)			45th Street (Northbound)			40th Avenue (Eastbound)		
	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
NDDOT: 10/23/2018	29%	59%	12%	20%	60%	20%	10%	79%	10%	12%	40%	48%
SL: 10/23/2018	39%	47%	14%	5%	82%	13%	58%	9%	33%	19%	76%	5%
SL: 11/2019 – 2/2020	33%	51%	16%	21%	64%	15%	11%	74%	14%	12%	45%	43%
Percentage Point Difference*	-4%	8%	-3%	-1%	-4%	5%	-1%	5%	-4%	0%	-5%	5%
42 <sup>nd</sup> Street and 40 <sup>th</sup> Avenue	42nd Street (Southbound)			40th Avenue (Westbound)			42nd Street (Northbound)			40th Avenue (Eastbound)		
	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
NDDOT: 10/23/2018	25%	51%	24%	26%	60%	14%	19%	69%	12%	9%	66%	25%
SL: 10/23/2018	25%	42%	34%	30%	67%	2%	16%	84%	0%	10%	30%	60%
SL: 11/2019 – 2/2020	25%	44%	31%	27%	63%	10%	17%	62%	21%	13%	66%	22%
Percentage Point Difference*	-1%	7%	-7%	-2%	-3%	4%	2%	7%	-9%	-4%	1%	3%
45 <sup>th</sup> Street and 52 <sup>nd</sup> Avenue	45th Street (Southbound)			52nd Avenue (Westbound)			45th Street (Northbound)*			52nd Avenue (Eastbound)		
	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
NDDOT: 10/23/2018	30%	0%	70%	35%	65%	0%	0%	100%	0%	0%	83%	17%
SL: 10/23/2018	31%	3%	66%	48%	48%	3%	40%	46%	14%	0%	72%	28%
SL: 11/2019 – 2/2020	24%	2%	73%	39%	60%	1%	38%	46%	16%	0%	80%	20%
Percentage Point Difference*	6%	-2%	-4%	-4%	5%	-1%	-38%	54%	-16%	0%	3%	-3%

\*Compares NDDOT data to StreetLight data from 11/19 to 2/20.

\*\*Under 100 vehicles per day.

LOW VOLUME  
APPROACH\*\*

StreetLight’s 24-hour intersection turning movement counts were pulled for the five study intersections along Veterans Boulevard from November 2019 thru February 2020, which focused only on data for Tuesdays,

Wednesdays, and Thursdays. This data was then compared to the modified ADT volumes developed for each intersection, which is summarized in the Appendix.

- » This data indicates that on a daily basis, the StreetLight ADT volumes were about 10 to 15 percent below the modified ADT volumes, although each approach varies.
- » StreetLight Data is broken down by hour, not 15-minute bins. Typical peak hour conditions within the region occur from 7:15 to 8:15 a.m. and 4:45 to 5:45 p.m.
- » The StreetLight 24-hour intersection turning movement counts were increased by approximately 10 percent to account for the actual peak hours.
- » The traffic volumes were balanced between intersections to reflect any access locations along the corridor, as well as any variations within the data.
- » Balanced a.m. and p.m. peak hour turning movement counts and modified ADT volumes are shown in Figure 17.

For quality control, the a.m. and p.m. peak hour intersection turning movement counts were then compared to the modified ADT volumes to ensure the peak hour to ADT volume ratios were in-line with typical metro area conditions.

- » Based on other area counts, the a.m. peak hour represents approximately eight to 10 percent of the ADT volume, while the p.m. peak hour represents approximately 10 to 12 percent of the ADT volume.
- » The intersection turning movement count data using this approach falls within these parameters, with the a.m. peak hour ratio at approximately 9 percent and the p.m. peak hour ratio at approximately 11 percent of the modified ADT volumes.

Based on the data provided, hourly traffic volume profiles were developed, as shown in Figure 16, to illustrate how travel patterns vary along the corridor. In general, there is a distinct a.m. and p.m. peak hour along the corridor. However, during the afternoon, there is a second p.m. peak hour that occurs around 3 p.m., which coincides with the adjacent high school and elementary school along the corridor.

Figure 16: Veterans Boulevard Hourly Traffic Volume Profiles

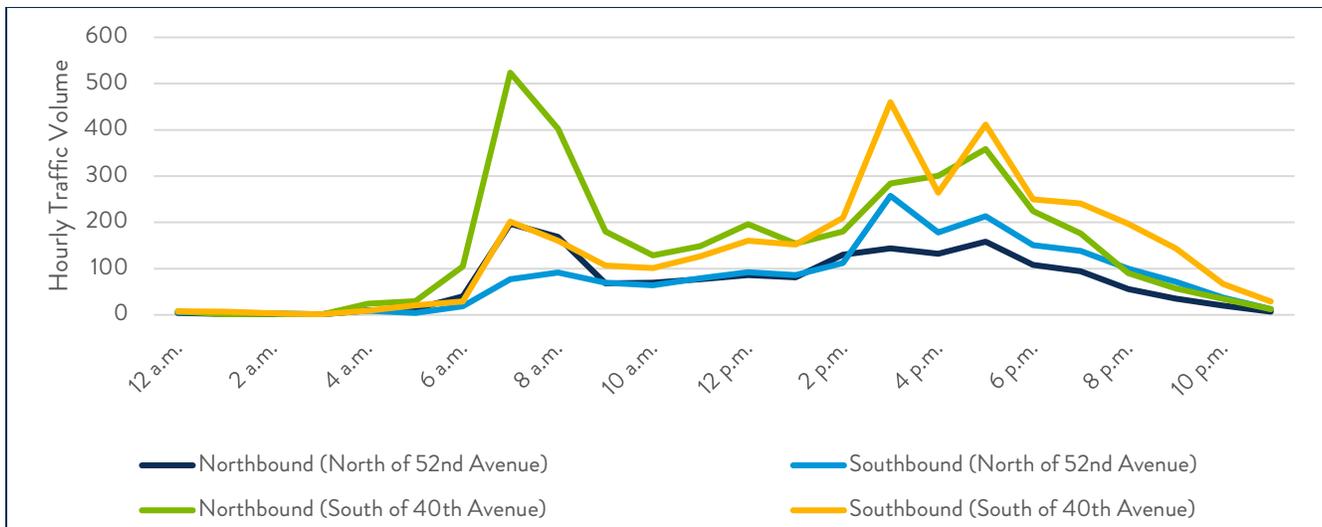
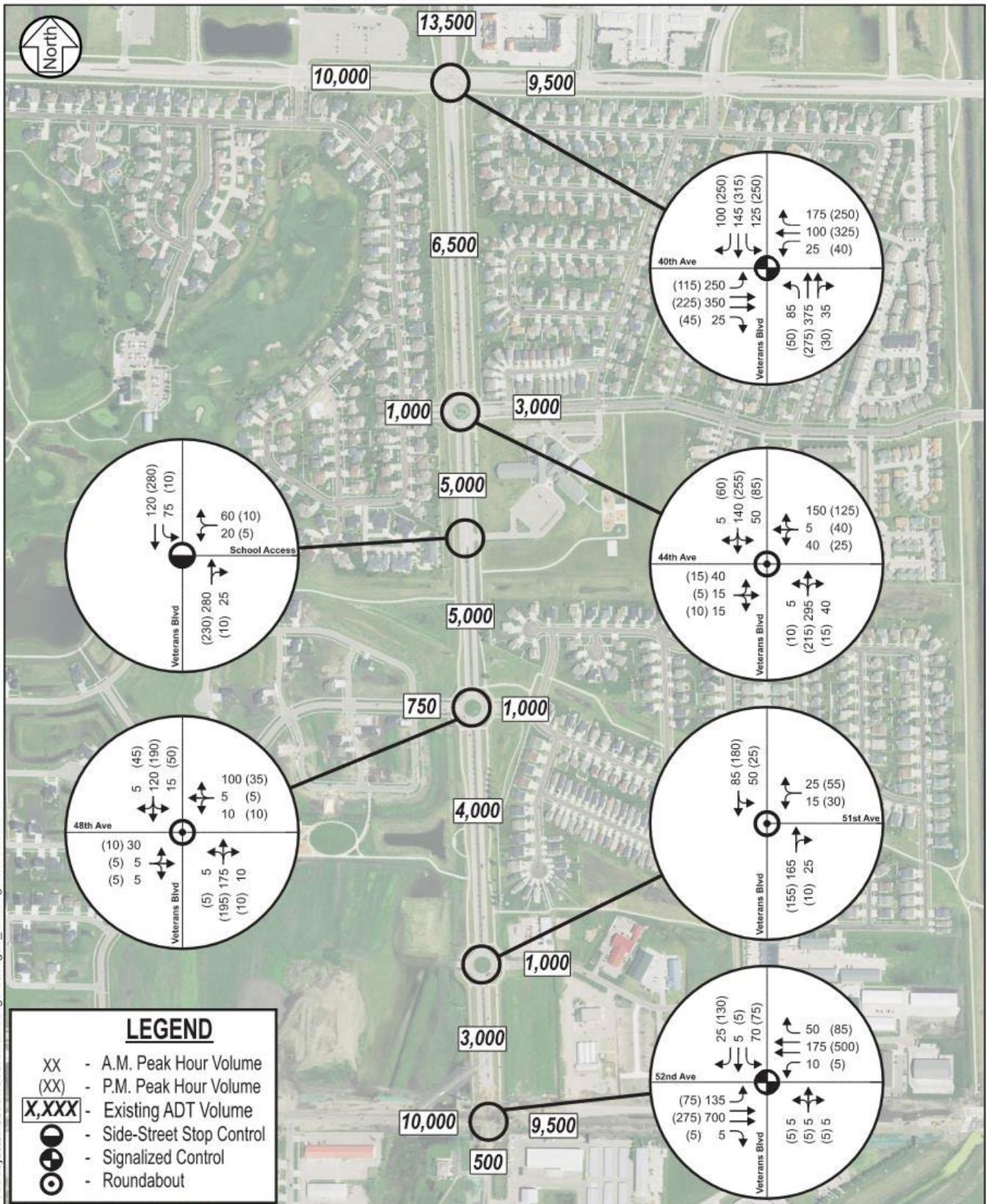


Figure 17: Existing Traffic Volumes



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## Traffic Operations

To quantify current operations at the existing Veterans Boulevard study intersections, a detailed peak hour intersection capacity analysis was conducted using a combination of Synchro/SimTraffic and the Highway Capacity Software (HCS). Capacity analysis results identify a Level of Service (LOS). LOS is a term used to describe the operational performance of transportation infrastructure elements; it assigns a letter grade value that corresponds to specific traffic characteristics within a given system, as shown in Table 4. At intersections, LOS is a function of average vehicle delay, whereas LOS for a roadway section is defined by the average travel speed. LOS A represents free flow traffic whereas LOS F represents gridlock. LOS E and F is considered deficient, in accordance with the NDDOT *Traffic Operations Manual* published in June 2015.

Table 4: Intersection Capacity Level of Service Thresholds

LOS Designation	Signalized Intersection Average Delay / Vehicle (Seconds)	Unsignalized Intersection Average Delay / Vehicle (Seconds)
A	≤ 10	≤ 10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

For side-street stop/yield-controlled intersections, special emphasis is given to providing an estimate for the level of service of the side-street approach. Traffic operations at an unsignalized intersection with side-street stop/yield control can be described in two ways.

1. First, consideration is given to the overall intersection level of service. This takes into account the total number of vehicles entering the intersection and the capability of the intersection to support these volumes.
2. Second, it is important to consider the delay on the minor approach. Since the mainline does not have to stop, the majority of delay is attributed to the side-street approaches. It is typical of intersections with higher mainline traffic volumes to experience high-levels of delay on the side-street approaches, but an acceptable overall intersection level of service during peak hour conditions.

Results of the existing intersection capacity analysis shown in Table 5 indicate that all study intersections and approaches currently operate at LOS C or better during the a.m. and p.m. peak hours. Even with the acceptable LOS, there were some queuing issues at the Veterans Boulevard and 40<sup>th</sup> Avenue intersection:

- » The westbound through movement’s 95<sup>th</sup> percentile queue extends approximately 315 feet and blocks access to the existing left- and right-turn lanes during the p.m. peak hour.
- » The southbound left-turn movement’s 95<sup>th</sup> percentile queue extends outside of the turn lane during the p.m. peak hour.

Detailed intersection capacity analysis results are included in the Appendix.

Table 5: Existing Intersection Capacity Analysis

Intersection	Traffic Control	A.M. Peak Hour		P.M. Peak Hour	
		LOS	Delay	LOS	Delay
Veterans Boulevard / 40 <sup>th</sup> Avenue	Signal	C	21 sec.	C	24 sec.

Veterans Boulevard / 44 <sup>th</sup> Avenue	Roundabout	A	5 sec.	A	6 sec.
Veterans Boulevard / School Access	Stop	A / B	12 sec.	A / B	11 sec.
Veterans Boulevard / 48 <sup>th</sup> Avenue	Roundabout	A	4 sec.	A	5 sec.
Veterans Boulevard / 51 <sup>st</sup> Avenue	Roundabout	A	4 sec.	A	4 sec.
Veterans Boulevard / 52 <sup>nd</sup> Avenue	Signal	B	15 sec.	B	14 sec.

## Corridor Safety

A crash analysis was completed for the existing Veterans Boulevard study corridor from 40th Avenue to 52nd Avenue to identify any trends, hotspots, or contributing factors. Three years of crash history was provided by the NDDOT, which includes data from January 1, 2017 through December 31, 2019. During the study period, there were a total of 36 crashes within the study area. Along the Veterans Boulevard corridor, the following overall trends were identified:

- » The majority of crashes (89 percent) occurred at the 40<sup>th</sup> Avenue or 44<sup>th</sup> Avenue intersections.
- » Angle and rear-end crashes were the predominant crash types (70 percent).
- » There were no fatal crashes, but there was one incapacitating injury crash.
- » There was one bicycle crash reported. There were no pedestrian involved crashes reported.

## Crash and Severity Rates

To identify overrepresented crash locations within the study corridor, the critical crash rate analysis method was used. The critical crash analysis method uses statistical analysis to help determine if differences between observed crash rates and typical crash rates are statistically significant and likely attributable to roadway design or traffic control. This method calculates location-specific crash rates and compares those rates against crash rates for similar facilities. MnDOT data was used for this critical crash analysis because it is the most comprehensive and highest quality data set currently available. Calculating severity rates uses a similar process using the injury statistics. Note that the severity rates represent the fatal and severe injury crash rate. Table 6 shows the crash and severity rates.

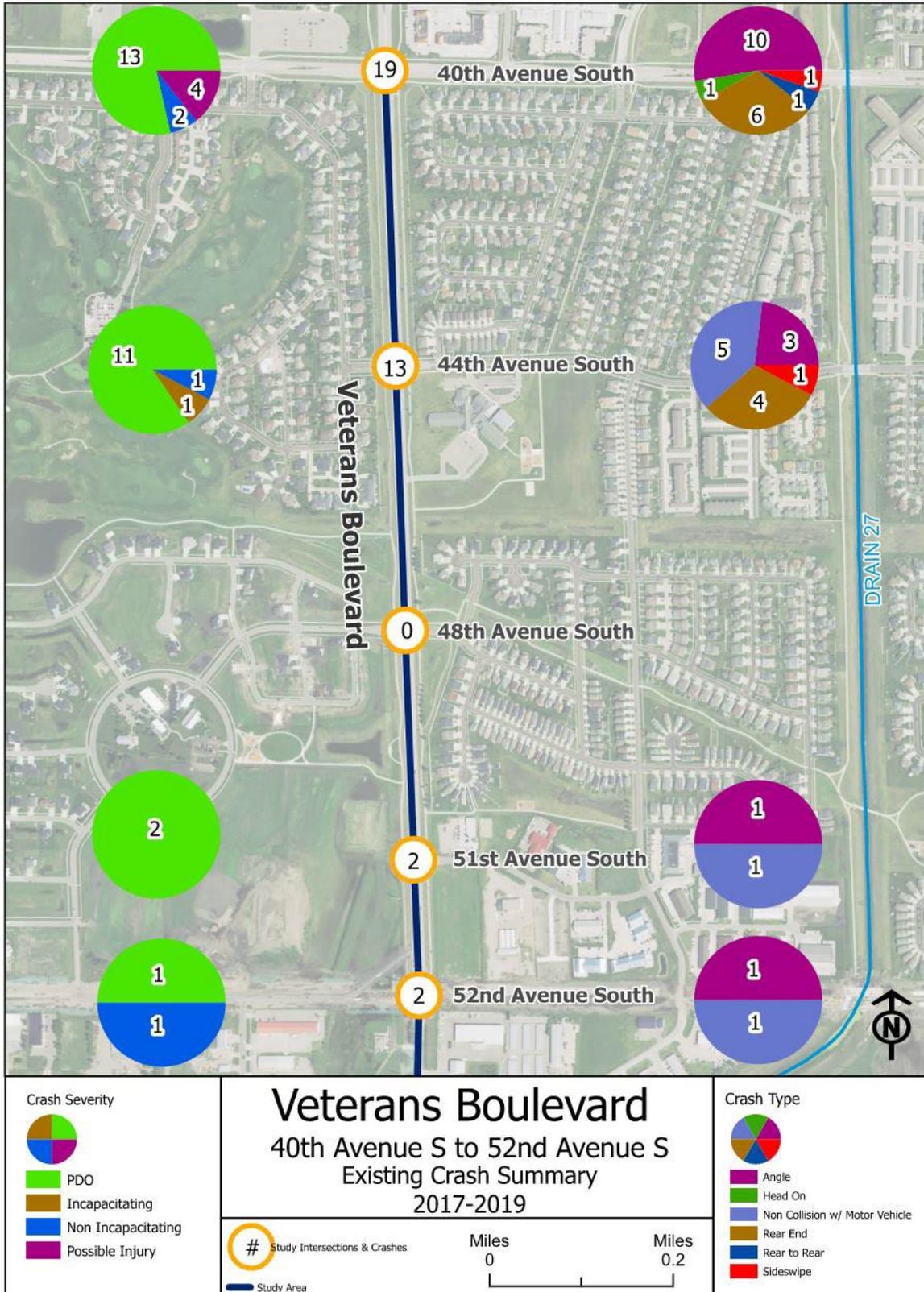
Table 6: Existing Crash and Severity Rate Comparison

Intersection	Traffic Control	Crash Rates			Severity Rates		
		Actual	Average*	Critical*	Actual	Average*	Critical*
Veterans Boulevard / 40 <sup>th</sup> Avenue	Signal	0.88	0.52	0.95	0.00	0.44	4.58
Veterans Boulevard / 44 <sup>th</sup> Avenue	Roundabout	1.53	0.32	0.88	11.78	0.31	8.65
Veterans Boulevard / School Access	Stop	0.00	0.19	0.73	0.00	0.36	12.10
Veterans Boulevard / 48 <sup>th</sup> Avenue	Roundabout	0.00	0.32	1.01	0.00	0.36	11.75
Veterans Boulevard / 51 <sup>st</sup> Avenue	Roundabout	0.46	0.32	1.13	0.00	0.31	15.14
Veterans Boulevard / 52 <sup>nd</sup> Avenue	Stop**	0.16	0.19	0.54	0.00	0.36	6.48

\*MnDOT values

\*\*Was a stop-controlled intersection for the majority of the crash analysis period.

Figure 18: Crash Type and Severity



Results of the crash rate analysis indicate that three intersections along the corridor have a crash rate above the average crash rate for intersections with similar characteristics. However, it should be noted that higher than average crash rates do not necessarily indicate a significant crash problem. Therefore, the critical crash rate was calculated to determine the statistical significance of the above average crash rates. If the calculated crash rates are below the critical crash rates, crashes that occurred are likely due to the random nature of crashes and not necessarily a geometric design or traffic control issue. If the calculated crash rates are above the critical crash rates, there is a significant number of crashes above normal to warrant further review or mitigation. Only the Veterans Boulevard and 44<sup>th</sup> Avenue intersection has a crash rate above the critical crash rate.

From an intersection severity rate perspective, only the Veterans Boulevard and 44<sup>th</sup> Avenue intersection has a severity rate above the average rate for intersections with similar characteristics. This intersection severity rate is also above the critical severity rate, which is because of the bicyclist injury crash at this location. If this crash did not occur, the 44<sup>th</sup> Avenue severity rate would be zero. Potential safety improvements will be identified later in this study process.

### *Crash Hot Spots*

Based on the critical crash and severity rate analysis, two locations justify a more in-depth evaluation of existing crash trends.

#### **Veterans Boulevard and 40<sup>th</sup> Avenue**

The Veterans Boulevard and 40<sup>th</sup> Avenue intersection experienced 19 crashes during the study period. Of these crashes, 10 were angle crashes (52 percent) and seven were rear-end crashes (37 percent).

Two trends emerge when reviewing the angle crashes. First, 60 percent of the angle crashes involved a vehicle going northbound. This intersection operates with protected (green arrow) and permissive (green ball) signal timing. The high-speed nature of the corridor and negative offset left-turn lanes may make it challenging for drivers to judge gaps in southbound traffic, resulting in angle crashes. Second, where crash time of day data is available (2018 and 2019), 67 percent of angle crashes are occurring during peak traffic hours (a.m. and p.m. peak hours and school release). As drivers wait through long queues, they may grow frustrated and accept smaller gaps.

*Figure 19: Northbound Traffic View at the 40th Avenue Intersection*



Rear-end crashes are common at signal-controlled intersections because they interfere with driver expectancy. At this location, six of the seven rear-end crashes occurred on the southbound approach. This could be attributed to the trap lane condition in the southbound direction.

### Veterans Boulevard and 44<sup>th</sup> Avenue

Despite the critical crash rate and critical severity rate, the trends at this intersection are less clear.

- » Four of 13 (31 percent) crashes were single-vehicle crashes that failed to negotiate the roundabout. The small footprint of the roundabout, combined with driver inexperience, may create driving challenges around this roundabout.
- » Four of 13 (31 percent) crashes were rear-end crashes. Two occurred during the a.m. peak hour going north. Unexpected queues may interfere with driver expectancy resulting in rear-end crashes.
- » There was one bicycle-involved crash that occurred around school release time, although the crash occurred during summer conditions. This location was identified in the Safe Routes to School Plan as having low yield behavior and in need of crossing improvements.

### EXISTING CONDITIONS SUMMARY

Within the Veterans Boulevard study area, there are a variety of existing conditions that will guide and constrain the corridor's extension and the alternatives which can be considered. Below is a summary of these conditions.

- » Right-of-Way. Most of the land surrounding the corridor has not been platted, resulting in a lack of right-of-way. The full build out of Veterans Boulevard will dictate these right-of-way needs and guide subdivision processes in the City of Horace and City of Fargo.
- » Utilities. Both public and private utilities are present along the corridor. Coordination with these utilities will be necessary during construction activities.
- » Environmental Conditions on the Existing Corridor. Several environmental constraints are present along the existing corridor of Veterans Boulevard including water resources and noise sensitive land uses. These constraints will require additional consultation during any construction project to minimize potential impacts.
- » Environmental Conditions will Constrain the Extension. Water resources and constraints, including Drain 27, and flood plains will be the primary environmental constraint when evaluating future alignments for the Veterans Boulevard corridor. The stormwater size and location will be a major determinant in future alignments.
- » Multimodal Facilities. The existing corridor has facilities on both sides of the roadway with marked crossings. Transit serves the north end of the study area with hourly service. The number of facilities combined with the nearby schools and other pedestrian generators should put a high priority on pedestrian and bicycle mobility. The corridor extension should seek to provide a similar or higher level of multimodal amenities.
- » Traffic Operations. All study intersections and approaches currently operate at LOS C or better during the a.m. and p.m. peak hours. Some queueing issues exist during the p.m. peak hour at the Veterans Boulevard and 40<sup>th</sup> Avenue intersection.
- » Corridor Safety. There was a total of 36 crashes within the study area, the majority of which occurred at intersections along Veterans Boulevard with 40<sup>th</sup> Avenue or 44<sup>th</sup> Avenue. There were no fatal crashes along the corridor, although there was one incapacitating injury crash that occurred at 44<sup>th</sup> Avenue (bicyclist crash). Only the Veterans Boulevard and 44<sup>th</sup> Avenue intersection has a crash rate and severity rate above the critical rates for intersections with similar characteristics.

## **CHAPTER 2. PUBLIC INPUT SUMMARY**

## INTRODUCTION

Building a future extension of the Veterans Boulevard corridor from scratch lets the community focus on what and needs to define the future land use and roadway network. This means engaging with property owners, developers, government entities, and the general public to understand key issues surrounding development of the future corridor. The purpose of the Visioning Report is to summarize all the different ways that the existing and projected needs and opportunities of the corridor were identified. To help guide the development of alternatives for the future corridor, this report summarizes the key stakeholder engagement, the community engagement, and the collective vision for the corridor that emerged.

## KEY STAKEHOLDER ENGAGEMENT

A study review committee (SRC) was assembled to review all project materials and provide guidance throughout the visioning phase. The committee consisted of 15 representatives from eight government entities, listed below.

- » City of Fargo
- » City of West Fargo
- » City of Horace
- » Cass County
- » Southeast Cass Water Resource District
- » Metro COG
- » North Dakota Department of Transportation
- » Federal Highway Administration – North Dakota

In addition to reviewing project materials, this committee participated in a series of direction-setting exercises during a visioning workshop. A description of each workshop item is described below with a summary of the results.

### Value Profile

The Value Profile was a worksheet distributed to each SRC member during the visioning workshop. Each member was asked to place a priority score on four values (Vehicle Efficiency, Safety, Livability, and Cost and Impacts) such that the sum of the scores across the four values was equal to 100. This priority scoring was done separately for two segments of the Veterans Boulevard Corridor: 40<sup>th</sup> Avenue to 76<sup>th</sup> Avenue and 76<sup>th</sup> Avenue to 100<sup>th</sup> Avenue.

For both segments of the Veterans Boulevard Corridor, twelve value profile sheets were completed. Figure 20 shows the average value scores for the corridor between 40<sup>th</sup> Avenue and 76<sup>th</sup> Avenue. Figure 21 shows the average value scores for the corridor between 76<sup>th</sup> Avenue and 100<sup>th</sup> Avenue.

Figure 20: Value Profile Results, Veterans Boulevard between 40th Avenue and 76th Avenue

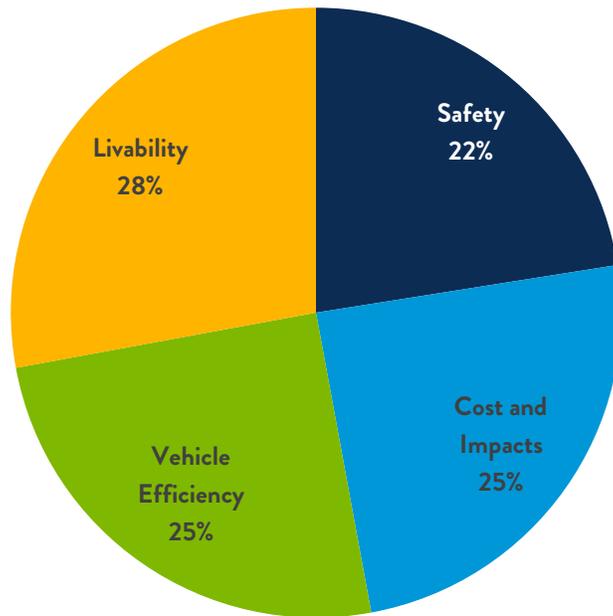
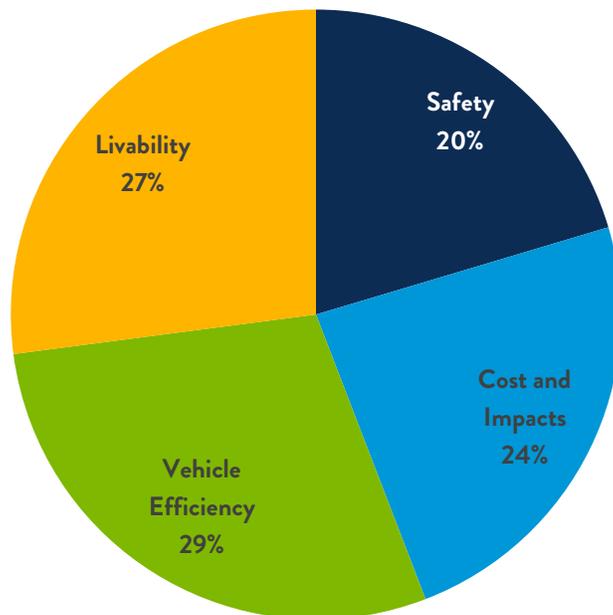


Figure 21: Value Profile Results, Veterans Boulevard between 76th Avenue and 100th Avenue



## Visual Preference Survey

At the visioning workshop, SRC members were given a Form and Function Survey that asked the question, “if you got to build a road from scratch, what would it look like?”. This question was asked for three different categories: Bike and Pedestrian Facilities, Cross Sections and Traffic Control, and Street Features. For each category, committee members could select as many pre-determined features as desired, and also had the option to add an “other” response. Figure 22, Figure 23, and Figure 24 show the results from the Form and Function Survey.

Generally, the committee preferred shared use path with boulevard for the bicycle and pedestrian facilities. Other considerations were to incorporate a shared use path on both sides of the roadway and to ensure connections to the future facilities along Drain 27.

For the cross-section and traffic control, the committee generally preferred the raised medians and roundabouts, similar to the Veterans Boulevard section between 40<sup>th</sup> Avenue and 52<sup>nd</sup> Avenue, as well as rectangular rapid flashing beacons (RRFBs) at high activity crossing locations (schools, recreation destinations, etc.). The committee suggested the use of grass medians with street trees and ensuring the roundabouts are more appropriately sized.

For the street features, decorative lighting, bus shelters, street furniture, bioswales, and refuge islands were the most popular features. The committee also suggested plantings and native plantings.

Figure 22: Form and Function Survey Results, Bicycle and Pedestrian Facilities

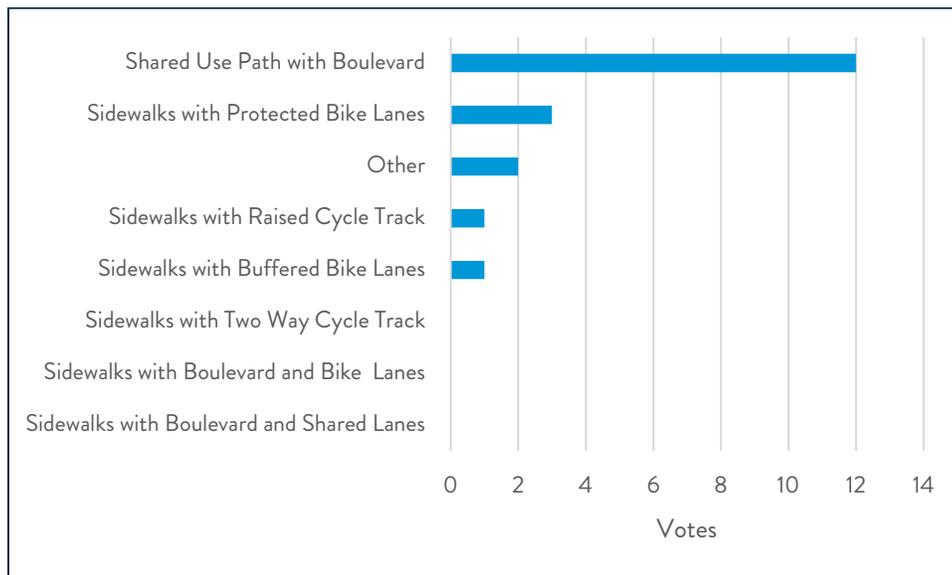


Figure 23: Form and Function Survey Results, Cross Sections and Traffic Control

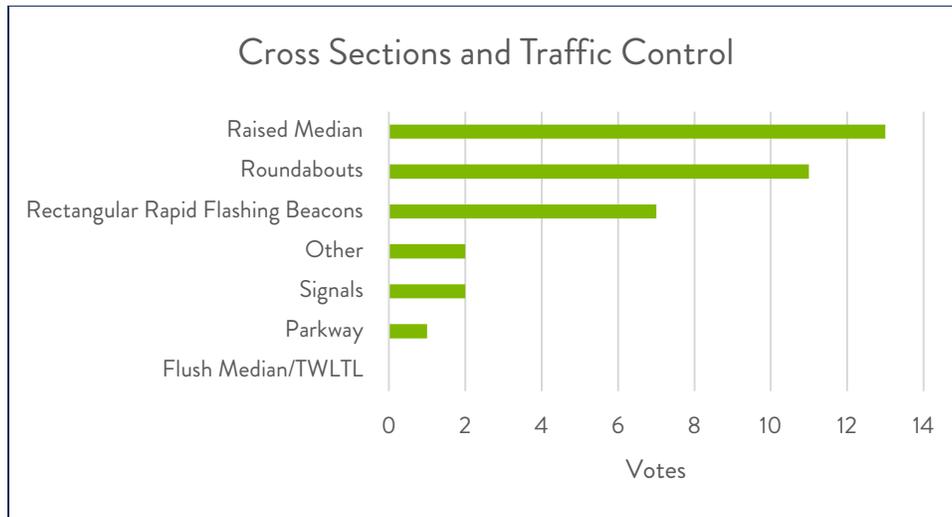
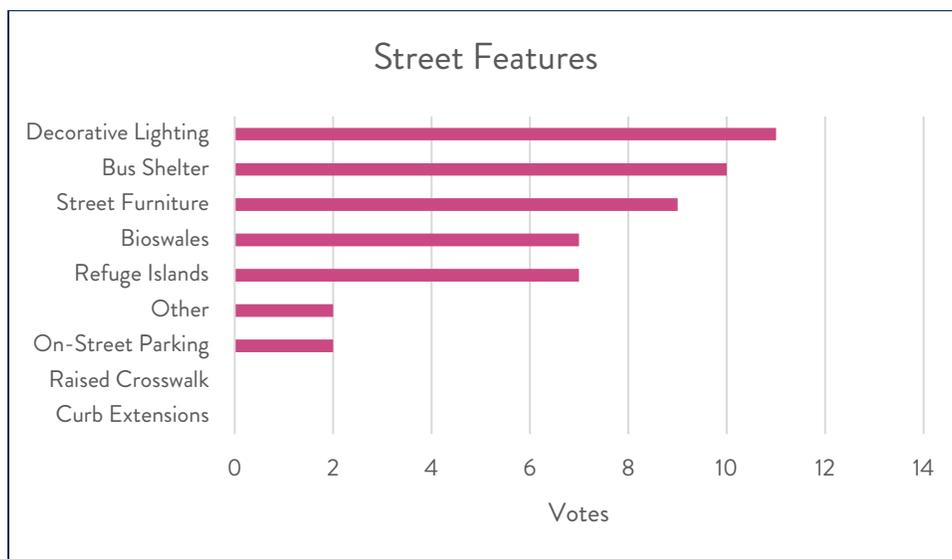


Figure 24: Form and Function Survey Results, Street Features



## Demographics and Growth

The visioning workshop concluded with a discussion of future land use and socioeconomic expectations used in Metro COG’s travel demand model. Members of the SRC agreed that residential density was likely to increase between 52<sup>nd</sup> Avenue and 76<sup>th</sup> Avenue within the 2045 planning horizon. It was also mentioned that the 2045 MTP demographic allocations for Horace are likely too low given certain developments that were unknown at the time. In addition the citing of new schools, including Horace High School and Heritage Middle School were unknown at the time. Ultimately, the SRC revised the socioeconomic data for the travel demand model based on these new land use expectations.

## COMMUNITY ENGAGEMENT

In addition to the study review committee’s feedback, the first round of public engagement focused on understanding the community’s primary issues, needs, and opportunities as related to the Veterans Boulevard corridor. This was done in two ways: focus groups and a virtual open house.

## Focus Groups

Listening sessions were held with some of the key stakeholders identified by the Study Review Committee for this project. Five listening sessions were held with representatives of governing bodies, emergency services, the business community, local partners, schools, parks, and residents.

Figure 25: Focus Group Participants



## Focus Group Discussion Summary

The purpose of the listening sessions was to provide an opportunity for the project team to listen and learn from those most directly impacted by the project regarding the public participant’s concerns, issues, and visions of the corridor. The following is a summary based on questions asked of the participants. Four general questions were prepared for the listening sessions. The summary of the sessions is discussed below.

### What do you love about your community?

Four major themes emerged when this question was asked at each focus group meeting. Below is a summary of the responses.

- » **Close-knit Community:** In each focus group meeting, at least one person described their love for the sense of community in the Fargo-Moorhead metro area. Some talked about small-town feel, others described it as a sense of belonging, and some talked about how well the communities work together.
- » **Recreational Amenities:** Many focus group members loved the parks, bike trails, walking trails, and open space throughout the metro area.
- » **Urban Vibrancy:** Many loved that Fargo-Moorhead balanced a small town feel with the amenities of a large metro area. A vibrant downtown area, shops, walkable residential and commercial areas, urban continuity, and extensive tree canopy were all identified as attractive features of the metro area.
- » **Connectivity and Accessibility:** Participants in several of the focus groups loved the ease of getting around the metro area. Particularly for emergency services, the road network is well connected and well maintained.

### What places do you enjoy walking, biking, or driving, and what places do you avoid?

This question received a wide range of responses. Some focus group members were specific about locations locally and nationally, while others described situations without one location in mind. Table 7 summarizes the responses to this question received from all focus groups.

Table 7: Focus Group Responses

Enjoyable places to walk, bike, or drive...	Avoided places...
<ul style="list-style-type: none"> <li>» Have good directional markings</li> <li>» Have green space and trails</li> <li>» Have good tree canopy, including evergreens to add color during the winter</li> <li>» Have shared-use paths connecting schools to neighborhoods</li> <li>» Are walkable</li> <li>» Have public art and landscaping</li> <li>» Have water features</li> <li>» Have transit stops that are well integrated into the street design</li> </ul>	<ul style="list-style-type: none"> <li>» Are inaccessible or difficult to navigate by emergency vehicles and buses</li> <li>» Have poor visibility</li> <li>» Have too much side street traffic (poor access spacing)</li> <li>» Have poor quality pavement</li> <li>» Have high vehicle speeds and heavy traffic</li> <li>» Have too many traffic signals</li> <li>» Have large parking lots</li> </ul>

### What aspects of Veterans Boulevard between 40<sup>th</sup> Avenue and 52<sup>nd</sup> Avenue do you like?

The points below summarize the responses to this question from all five focus groups.

- » The roundabouts were generally popular among focus group participants. Several mentioned that roundabouts help control traffic speeds, make the corridor safer, and allow vehicles to pass through without stopping.
- » Several participants approved of the clean and modern design of the corridor. In particular, the medians, shared-use paths, and limited access points contribute to the success of the corridor.
- » Other aspects that were popular include traffic speeds that are not too slow or too fast, separation between the road and shared-use paths, and the green spaces.

### What issues exist on Veterans Boulevard between 40<sup>th</sup> Avenue and 52<sup>nd</sup> Avenue?

The points below summarize the responses to this question from all five focus groups.

- » Focus group participants generally approved of roundabouts, but several voiced that the existing roundabouts are too small, becoming a challenge to navigate in winter. In particular, the roundabouts

cause issues for emergency vehicles and lengthen response time. One focus group member suggested that future roundabouts have a mountable curb that large vehicles can drive over.

- » Driver visibility is poor in winter. This is partially due to the open spaces creating a windy environment in which snow rapidly accumulates on the road.
- » The Osgood Elementary School was repeatedly mentioned as a cause for traffic congestion on Veterans Boulevard. Many described backups during pick up and drop off times, which sometimes impact the roundabouts.
- » A concern that was voiced by several participants was connectivity to and between residential developments adjacent to the corridor. Limited access points for vehicles were viewed as positive from a safety and traffic management perspective, but potentially problematic for residents living nearby for whom the limited access is inconvenient and challenging for emergency services.
- » The corridor lacks identity. Very little indicates being located in Fargo.
- » The corridor is not comfortable to walk along as the road is too busy and lacks a sense of enclosure.

#### What features are most important to include on the future Veterans Boulevard extension?

The points below summarize the responses to this question from all five focus groups.

- » A common concern among focus group members was the road width and setbacks. The future corridor extension should have large enough setbacks to avoid encroachments and sufficient road width for traffic demands and emergency response needs.
- » Many identified the need for green space, trees, public art, and landscaping along the corridor. One member suggested integrating public transit stops into the landscaping. Focus group members were particularly interested in artwork that reflected the community.
- » Good visibility, lighting, and clear signage are important to several focus group members.
- » While many agreed that limiting access points along the corridor improved operations, several focus group members also felt that east-west access into Deer Creek will be critical to the success of the corridor extension.
- » Several suggestions were provided for the roadway design, including points for vehicles to turn around and change direction, midblock pedestrian crossings between roundabouts, and dedicated turn lanes.

#### Are there connections to Veterans Boulevard you think should be evaluated?

The points below summarize the responses to this question from all five focus groups.

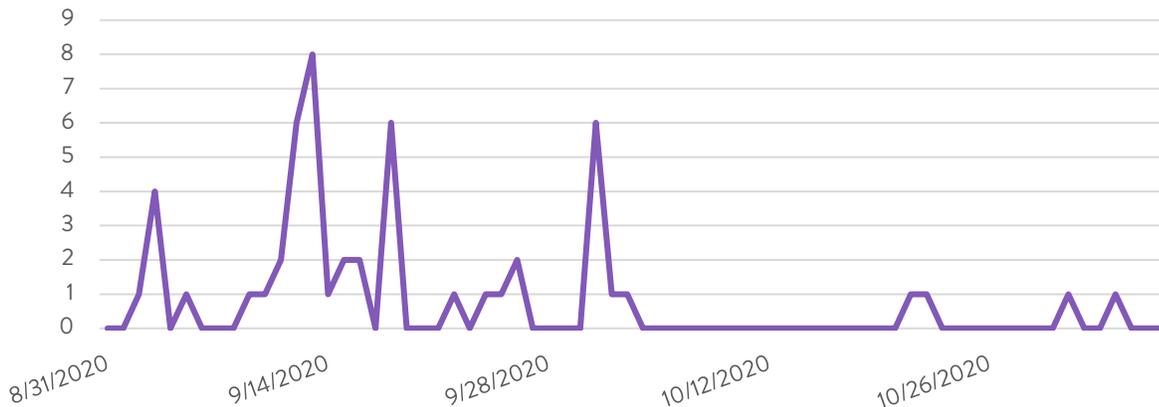
- » Connections to new housing developments are needed in general. For example, a Deer Creek access point around 58<sup>th</sup>/60<sup>th</sup> Avenue and between 64<sup>th</sup> and 76<sup>th</sup> Avenue.
- » Connections to parks and schools.
- » Connections to other major roads.

## Virtual Open House

Due to the COVID-19 pandemic, the first public input opportunity was held entirely online on a dedicated open house website, [www.vetsblvdextension.com](http://www.vetsblvdextension.com). At the virtual open house, visitors could review project documents, watch informational videos, complete a survey, and leave comments on an interactive map.

The open house ran from September 8<sup>th</sup> through October 4<sup>th</sup>. The open house was left open through October 31<sup>st</sup> to allow all focus group participants the opportunity to visit, if they hadn't already. Throughout this open house, there were 52 unique visitors. From these visitors, ten comments were left on the interactive map and 18 survey responses were recorded.

Figure 26: Visitors to the Virtual Open House



## Survey

The Veterans Boulevard extension survey contained three parts: a value profile, a series of questions regarding the vision for the future corridor extension, and demographic identification questions.

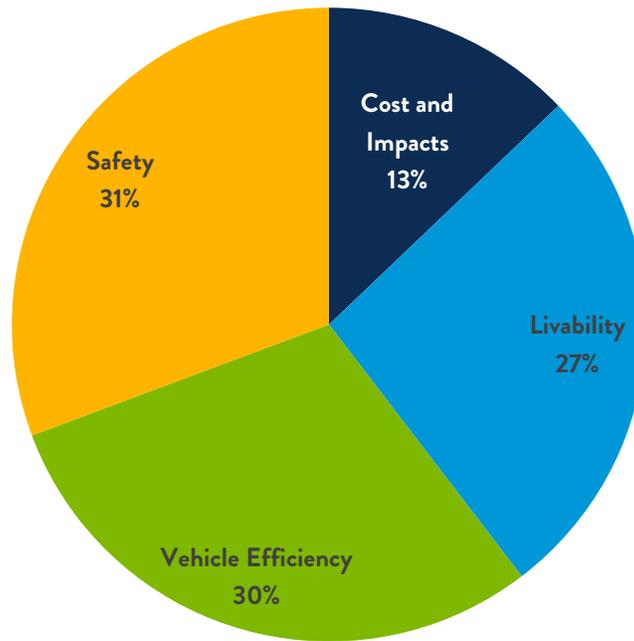
### Value Profile

Similar to the Study Review Committee, the value profile helps understand the community's priorities when developing and evaluating the alternatives. The public was asked to assign a value between 1 and 100 to each of the following categories:

- » **Vehicle Efficiency** - Maintaining a high level of vehicle operations through 2045.
- » **Safety** - Minimizing conflict potential for all modes of transportation.
- » **Livability** - Providing high quality multimodal facilities and safe and convenient crossings.
- » **Cost and Impacts** - Reducing the roadway footprint to minimize costs and environmental/property.

Figure 27 shows the average value scores from all survey responses. Safety and Vehicle Efficiency were the highest scoring values, followed closely by Livability. Cost and Impacts scored much lower than all other values.

Figure 27: Public's Value Profile



## Visioning Survey

In this section of the survey, the public was asked to identify elements desired on Veterans Boulevard in the future. Three questions were asked, one for each of the following categories: Cross Sections and Traffic Control, Bike and Pedestrian Facilities, and Street Features. Figure 28, Figure 29, Figure 30 show the question that were asked, and the responses received.

Figure 28: Visioning Survey Responses, Cross Sections and Traffic Control

Which of the cross-section and traffic control options would you like to see on Veterans Boulevard? Choose all that apply.

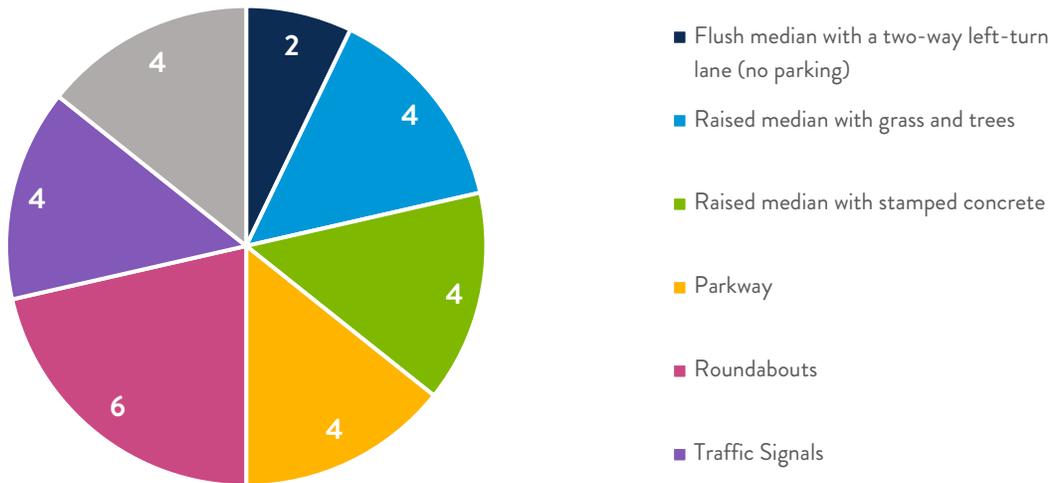


Figure 29: Visioning Survey Responses, Bike and Pedestrian Facilities

Which of the bike and pedestrian facility options would you like to see on Veterans Boulevard? Choose all that apply.

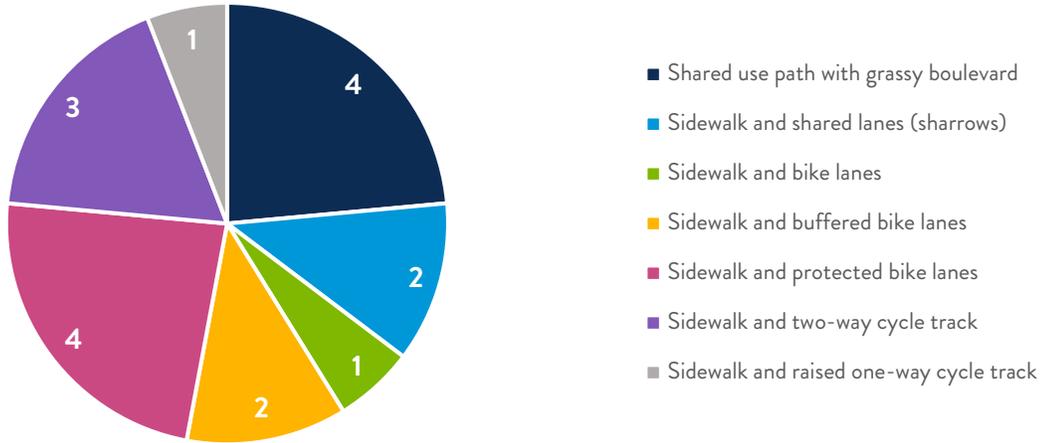
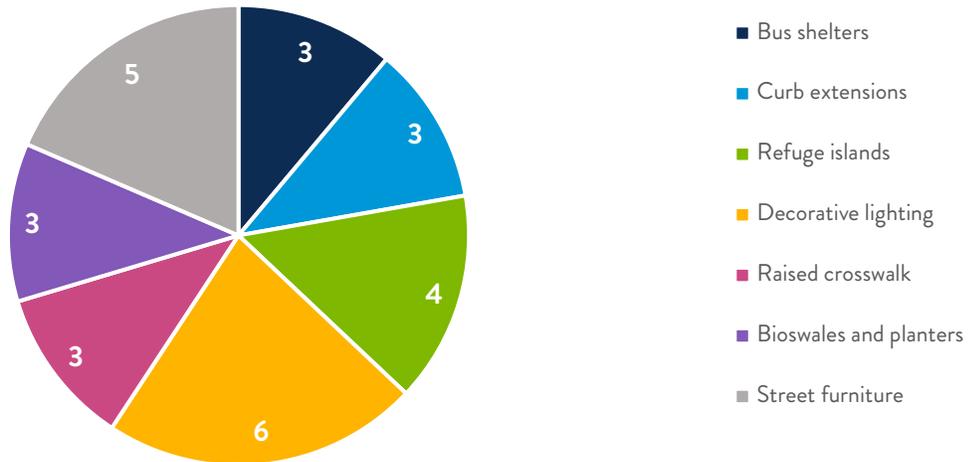


Figure 30: Visioning Survey Responses, Street Features

Which of the street features options would you like to see on Veterans Boulevard? Choose all that apply.



### *Interactive Issues Map*

The interactive issues map allowed participants to drop comments at specific locations around the issues and opportunities for five categories: Pedestrians, Bicyclists, Transit, Traffic, and Other. Ten comments were added to the map. Nine of the comments were related to traffic operations and safety, and one was related to roadway expansion. Below is a copy of all the comments that were added to the map, sorted from north to south along Veterans Boulevard.

#### 40<sup>th</sup> Avenue South to 52<sup>nd</sup> Avenue South

- » Consider adding some offset to the left turn lanes [on the northbound and southbound approaches to the intersection of Veterans Boulevard and 40<sup>th</sup> Avenue South]. It is difficult to see through traffic from the left turn lanes when there are vehicles occupying the turn lane opposite of one another.
- » It appears that the accesses at 38th Ave S and 58th St S for Sheyenne High School are not included in the scope of this study. However, [the intersection of Veterans Boulevard and 40<sup>th</sup> Avenue South] is. I think that reducing these accesses to right in/right out would improve safety for young drivers attending the high school. Can this intersection be modified to allow SB drivers to U-turn and head north on Veterans?
- » It would be good to look for methods to expand Veteran's Blvd between 40th and 52nd that doesn't involve an entire re-build in order to reduce cost and special assessments on neighboring properties.
- » If we decide to up Veterans Blvd to 4 lanes between 40th and 52nd, possibly further, what do we plan to do about [the three existing roundabouts]? Is there a way to expand them to keep them operational?

#### 52<sup>nd</sup> Avenue South to 76<sup>th</sup> Avenue South

- » Possible future intersection [between 52<sup>nd</sup> Avenue South and 64<sup>th</sup> Avenue South] providing connection to deer creek and additional connectivity.
- » Consider the possibility of adding a connection to the Deer Creek neighborhood to allow the neighborhood to have access to Veterans. Since this [connection to Veterans at 59<sup>th</sup> Avenue South] is not a direct route through the neighborhood cut through traffic should not be as much of a concern as allowing the neighborhood additional exit points.
- » Should consider preserving [the segment of the Veterans Boulevard extension between 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South] for a future intersection for connectivity between the major arterials.

#### 76<sup>th</sup> Avenue South to 100<sup>th</sup> Avenue South

- » Should consider preserving [the segment of the Veterans Boulevard extension between 76<sup>th</sup> Avenue South and 88<sup>th</sup> Avenue South] for a future intersection for connectivity between the major arterials.
- » Should consider preserving [the segment of the Veterans Boulevard extension between 88<sup>th</sup> Avenue South and 100<sup>th</sup> Avenue South] for a future intersection for connectivity between the major arterials.
- » What if we placed a roundabout at [Veterans Boulevard and 100<sup>th</sup> Avenue South] to keep traffic flowing smoothly on 100<sup>th</sup> Avenue?

## PUBLIC INPUT

As part of the study's public engagement effort, community members were asked to provide input on the Veterans Boulevard extension alternatives and the Deer Creek connection alternatives. This phase of public engagement was conducted from June through August 2021, and was hosted on the project website, where participants were able to access project information and respond to a survey regarding the alternatives. In total, 29 unique stakeholders completed the survey.

### Veterans Boulevard Extension Alternatives

For each corridor alternative, participants were asked to rate their degree of preference from "Strongly Oppose" to "Strongly Prefer." Participants were also invited to submit comments to express their opinions in more detail.

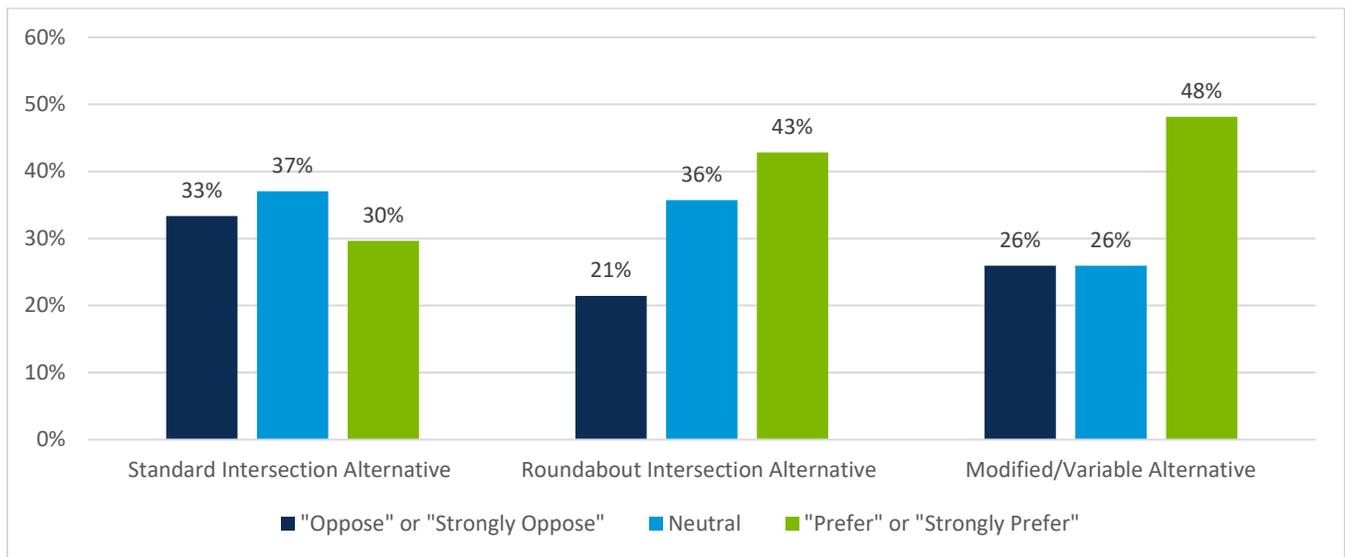
Survey results showed the Modified/Variable Alternative to have the most support among respondents, with 48 percent of participants preferring or strongly preferring this alternative. 43 percent of respondents prefer or strongly prefer the Roundabout Intersection Alternative, while less than a third of respondents prefer or strongly prefer the Standard Intersection Alternative.

Participants expressed the most opposition to the Standard Intersection Alternative, with 33 percent of respondents opposing or strongly opposing this alternative. Over a quarter of respondents oppose or strongly oppose the Modified/Variable Alternative, with just over a fifth of respondents opposing or strongly opposing the Roundabout Intersection Alternative. The Modified/Variable Alternative is the most polarizing option, with considerable degrees of both support and opposition, and the lowest relative portion of respondents having a neutral stance.

Comments submitted by respondents expressed a wide range of opinions on the corridor alternatives. One common theme was opposition to roundabouts due to the perception that they are difficult to use/maneuver and generally not appropriate for the corridor. However, some participants expressed the opinion that roundabouts are an effective choice. Several respondents praised the green space and bike/pedestrian facilities proposed for the Modified/Variable Alternative.

A summary of preference responses is provided in Figure 31.

Figure 31: Comparison of Preference Responses for Corridor Extension Alternatives



## Deer Creek Connection Alternatives

For each Deer Creek connection alternative, participants were asked to rate their degree of preference from “Strongly Oppose” to “Strongly Prefer.” Participants were also invited to submit comments to express their views in more detail.

Survey results showed the 59<sup>th</sup> Avenue Connection to have the most support among respondents, with 75 percent of responses expressing a preference or a strong preference for this alternative. In comparison, 52 percent of respondents indicated a preference or a strong preference for the 62nd Street Connection alternative.

Over 30 percent of respondents oppose or strongly oppose the 62<sup>nd</sup> Avenue Connection alternative. In contrast, 18 percent of participants oppose or strongly oppose the 59th Avenue Connection alternative.

Comments submitted by respondents expressed roughly even support for the two Deer Creek connection alternatives. Some respondents expressed support for implementing both alternatives. Comments in support of the 62<sup>nd</sup> Street Connection expressed that this would be the safer option because it would avoid direct traffic from Veterans Boulevard. Comments in support of the 59<sup>th</sup> Avenue Connection referenced more direct access to Veterans Boulevard and generally shorter travel times to and from the neighborhood.

Postcards soliciting input and survey results were mailed to 550 properties within the Deer Creek neighborhood. All residences east of 63rd Street received postcards, comprising roughly half of Deer Creek neighborhood properties. A summary of preference responses is provided in Figure 32.

Figure 32: Comparison of Preference Responses for Deer Creek Connection Alternatives

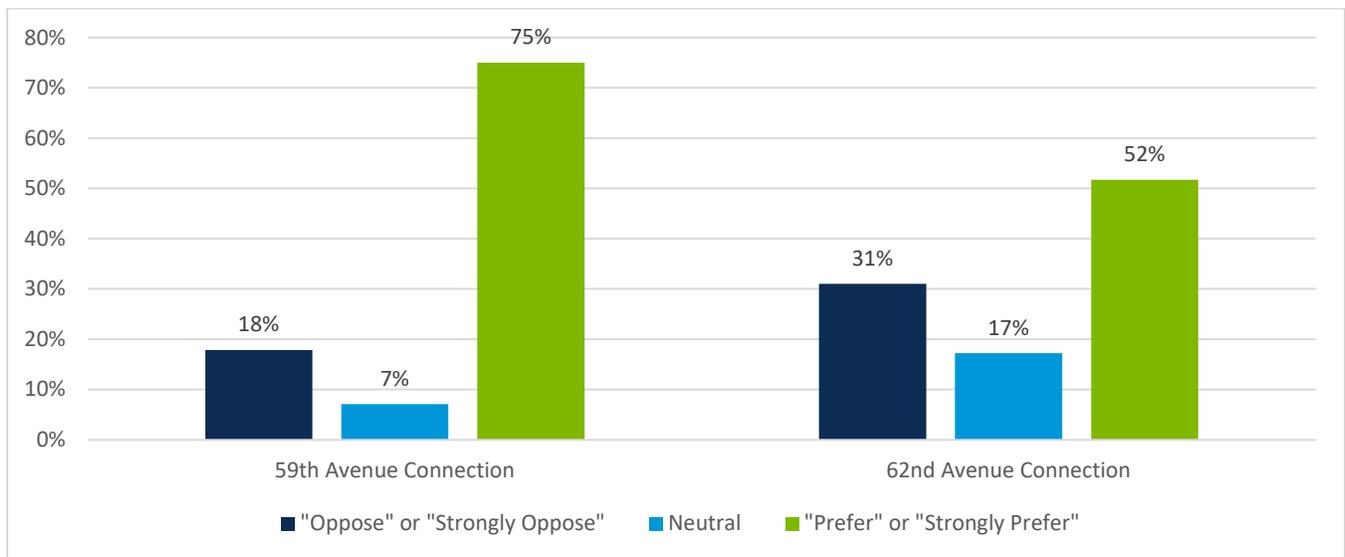


Figure 33: Comment Type by Location



## CORRIDOR VISION

The Veterans Boulevard Corridor Extension presents an opportunity for the community to shape the future road network of the southwest metro area. Neighbors, local business owners, city officials, emergency service workers, non-profit representatives, and city planners were all heard during this engagement process. Each brought a unique perspective to the issues and opportunities in the study area. The Corridor Vision, presented below, is a set of common interests and needs that emerged from the engagement process.

**The Veterans Boulevard Corridor will enhance livability and serve the whole community.** Creating a “sense of place” was a thread that ran through all the listening sessions. Community members felt that the corridor should be more than just a route through the southwest metro area, and should be a destination. Displays of public art that reflect the community, landscaping, green spaces, tree canopy, and recreational amenities will bring the community’s vision to life.

**The Veterans Boulevard Corridor will serve all modes.** Throughout the listening sessions, community members expressed the importance of the corridor serving pedestrians, bicyclists, and motorized traffic. The corridor was envisioned as a place where traffic flows smoothly and walking feels comfortable and safe. Beyond the needs of small vehicles, community members envisioned a corridor that was easily navigable by emergency vehicles and buses.

**The Veterans Boulevard Corridor will improve connectivity and remain flexible for future growth.** Veterans Boulevard is a critical connection between Horace and Fargo. As residential growth continues in the southwest metro area, connections from residential development and major east-west routes to the corridor will need to adapt to shifting demands. The Veterans Boulevard extension was envisioned as a roadway that can grow and change over time, with measures taken today to allow for the addition of intersections and roadway improvements in the future.

## **CHAPTER 3. TRAFFIC FORECAST SUMMARY**

## INTRODUCTION

Building a future extension of the Veterans Boulevard corridor from scratch lets the community focus on what and needs to define the future land use and roadway network. This means engaging with property owners, developers, government entities, and the general public to understand key issues surrounding development of the future corridor. The purpose of the Traffic Forecast Summary Report is to document key land use and roadway network assumptions associated with the development of traffic forecasts along Veterans Boulevard, as well as the adjacent transportation network. These forecasts are critical to understanding the short-, mid-, and long-term needs of the corridor, as well as the adjacent transportation system. The following information provides an overview of the methodology, assumptions, scenarios, and traffic forecasts.

## METHODOLOGY & ASSUMPTIONS

The focus area of the traffic forecast development process is generally bounded by Sheyenne Street/CR 17 to the west, I-29 to the east, 40<sup>th</sup> Avenue S to the north, and 100<sup>th</sup> Avenue S/CR 14 to the south. The purpose of looking at this study area was to understand how traffic volumes along Veterans Boulevard (and adjacent roadways) are impacted depending on changes to the transportation system, as well as to provide quality control through a screen line check to ensure the model is providing reasonably accurate forecasts. Based on discussion with the Study Review Committee (SRC), the following preliminary traffic forecast scenarios were reviewed.

- » 2035 Scenario
- » 2045 MTP Scenario
- » Full Build Scenario
- » Full Build with Transit Orientated Veterans Scenario

The first step in this process was to review the traffic analysis zone (TAZ) socio-economic data within the regional travel demand model. A summary of this process and key assumptions are outlined within the Veterans Blvd Corridor Extension Study TAZ Socioeconomic Memo prepared by MetroCOG and dated October 2020 (see Appendix). The second step in this process was for SRF to incorporate these socio-economic changes into the regional travel demand model and run each scenario. As part of this step, the MTP fiscally constrained transportation network was utilized. Note that minor updates to the model were incorporated to account for recent transportation network improvements, such as Sheyenne Street and Veterans Boulevard (north of 40<sup>th</sup> Avenue S), 52<sup>nd</sup> Avenue S, and 40<sup>th</sup> Avenue S (west of Veterans Boulevard), which did not reflect current conditions.

The assumed roadway network and associated traffic forecasts for these preliminary scenarios, which are shown in Figure 34 and Figure 35, respectively, were then shared with the SRC to determine the need for additional scenarios. Based on this discussion, additional scenarios were agreed upon by the SRC to provide further insight into the future transportation needs along Veterans Boulevard, as well as the adjacent transportation network. These additional scenarios focused on a realistic development and transportation network under year 2035 conditions, as well as a full-build out of the transportation network. Minor model adjustments were added for these additional scenarios.

Figure 34: Preliminary Scenarios - Roadway Network Assumptions

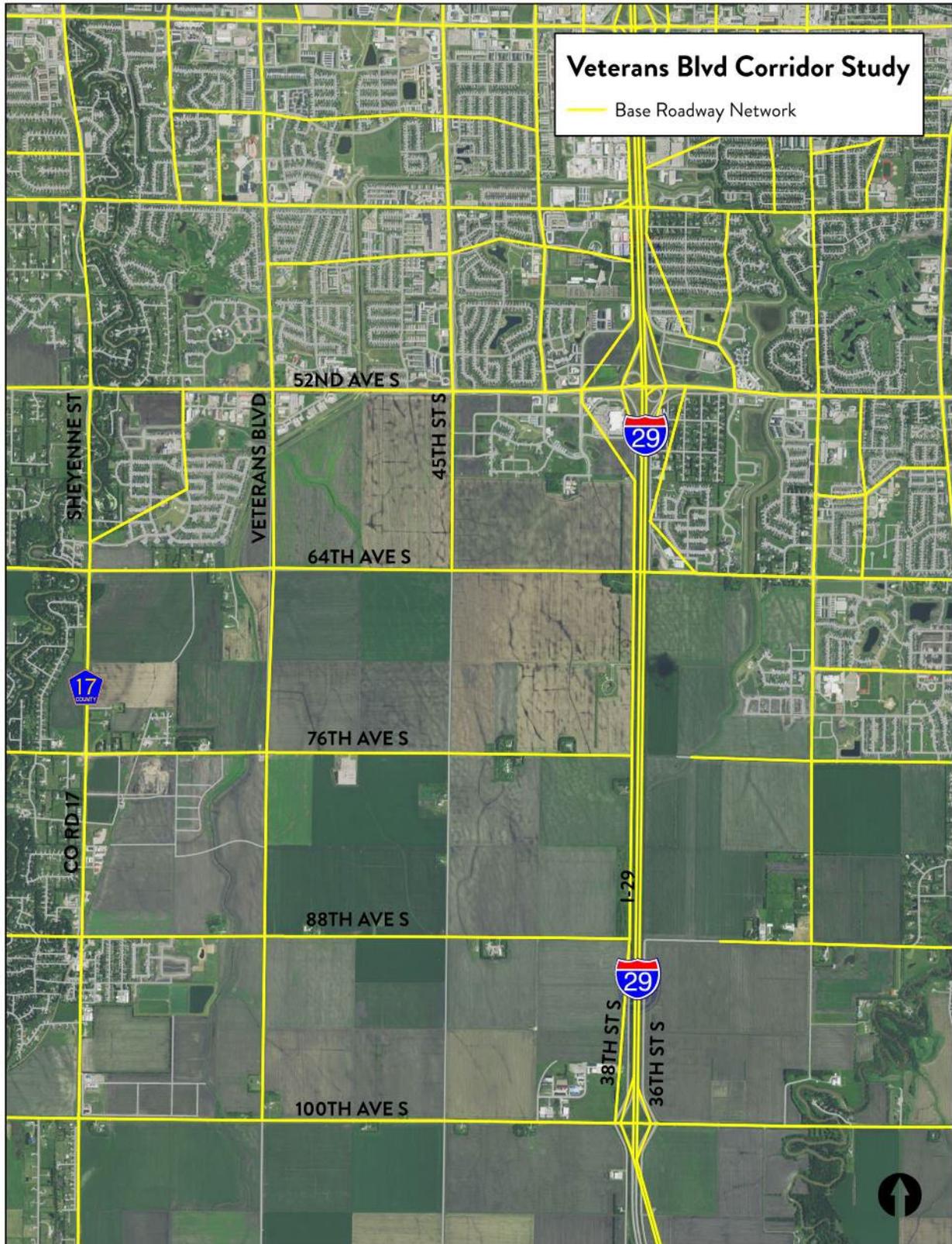
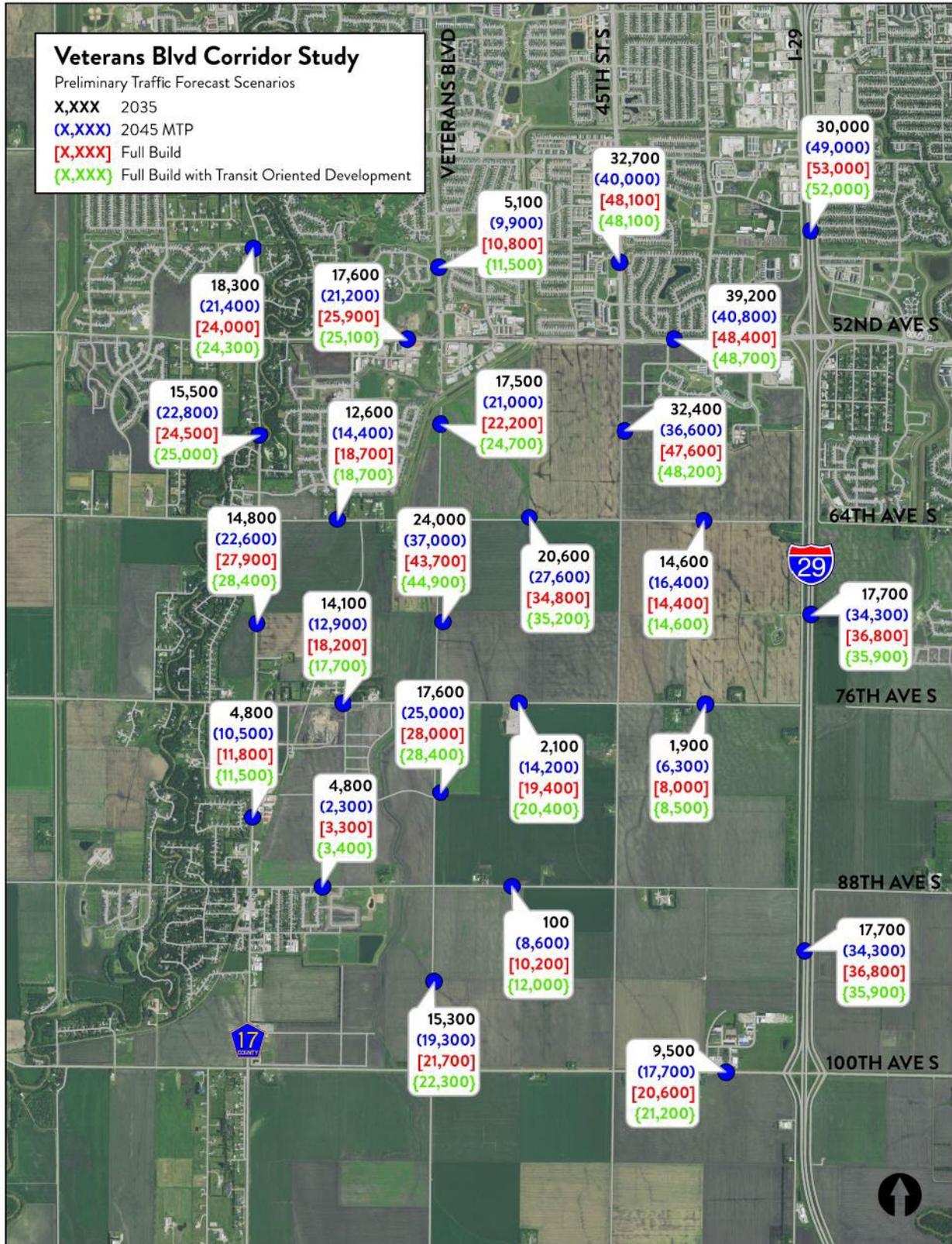


Figure 35: Preliminary Scenarios - Traffic Forecasts



The additional scenarios reviewed and key transportation network assumptions for each are outlined as follows:

- » 2035 Scenario 1
  - Extension of Veterans Boulevard to 76<sup>th</sup> Avenue S
  - Extension of 45<sup>th</sup> Street S to 76<sup>th</sup> Avenue S
  - Extension of 38<sup>th</sup> Street S to 64<sup>th</sup> Avenue S
  - Overpass at 64<sup>th</sup> Avenue S
  - Interchange at 76<sup>th</sup> Avenue S
  
- » 2035 Scenario 2
  - Same as Scenario 1, but “No” interchange at 76<sup>th</sup> Avenue S
  - Interchange at 64<sup>th</sup> Avenue S
  
- » Full Build Scenario 3A
  - Extension of Veterans Boulevard to 100<sup>th</sup> Avenue S
  - Extension of 45<sup>th</sup> Street S to 100<sup>th</sup> Avenue S
  - Extension of 38<sup>th</sup> Street S to 100<sup>th</sup> Avenue S
  - Overpass at 64<sup>th</sup> Avenue S
  - Interchange at 76<sup>th</sup> Avenue S
  - Expanded east-west corridors at 64<sup>th</sup> Avenue S, 76<sup>th</sup> Avenue S, and 88<sup>th</sup> Avenue S
  - “No” overpass at 88<sup>th</sup> Avenue S
  
- » Full Build Scenario 3B
  - Extension of Veterans Boulevard to 100<sup>th</sup> Avenue S
  - Extension of 45<sup>th</sup> Street S to 100<sup>th</sup> Avenue S
  - Extension of 38<sup>th</sup> Street S to 100<sup>th</sup> Avenue S
  - Interchange at 64<sup>th</sup> Avenue S
  - Interchange at 76<sup>th</sup> Avenue S
  - Expanded east-west corridors at 64<sup>th</sup> Avenue S, 76<sup>th</sup> Avenue S, and 88<sup>th</sup> Avenue S
  - “No” overpass at 88<sup>th</sup> Avenue S
  
- » Full Build Scenario 4
  - Same as Scenario 3, but “No” Veterans Boulevard connection between 52<sup>nd</sup> Avenue and 64<sup>th</sup> Avenue

A visual illustration of these additional scenarios is provided in Figure 36. Note that these additional scenarios (1 thru 4) represent the most realistic forecasts for the study area and include the most refined data. Therefore, more weight should be given towards these scenarios, as opposed to the preliminary scenarios investigated.

## TRAFFIC FORECASTS

A summary of the traffic forecasts for each of the additional scenarios are illustrated in Figure 37. The traffic forecasts specifically along Veterans Boulevard for these additional scenarios are also summarized in Table 8. Based on the traffic forecasts summarized in Table 8, future average daily traffic volumes along Veterans Boulevard are expected to range from approximately 5,600 vehicles per day (vpd) up to approximately 18,900 vpd, depending on the scenario. The transportation network and socio-economic assumptions associated with each scenario play a key role in the variation of the future traffic forecasts. However, it should be noted that 2035 Scenario 1 and 2035 Scenario 2 are the most reasonable near-term traffic forecasts, while the Full Build Scenario 3 forecasts are the most reasonable long-term forecasts. It is important to note that Full Build Scenario 4 was reviewed to determine the need and impacts associated without having a continuous Veterans Boulevard corridor. Under Scenario 4, volumes that would have been along Veterans Boulevard between 52<sup>nd</sup> Avenue S and 64<sup>th</sup> Avenue S generally go to Sheyenne Street or disperse along roadways to the east, such as 64<sup>th</sup> Avenue S, 76<sup>th</sup> Avenue S, and 45<sup>th</sup> Street S.

Figure 36: Additional Scenarios - Roadway Network Assumptions (Scenarios 1 thru 4)

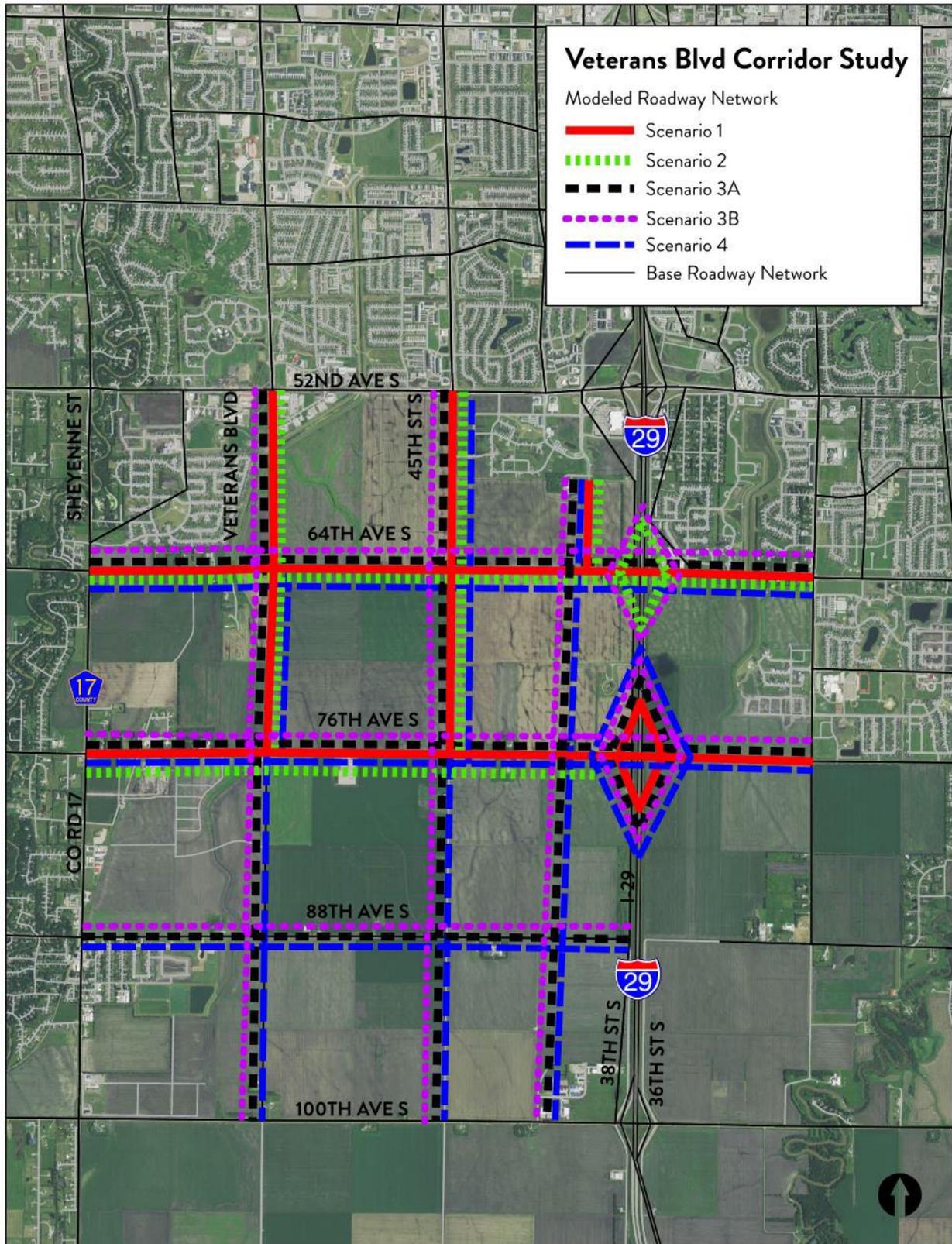


Figure 37: Additional Scenarios - Traffic Forecasts (Scenarios 1 thru 4)

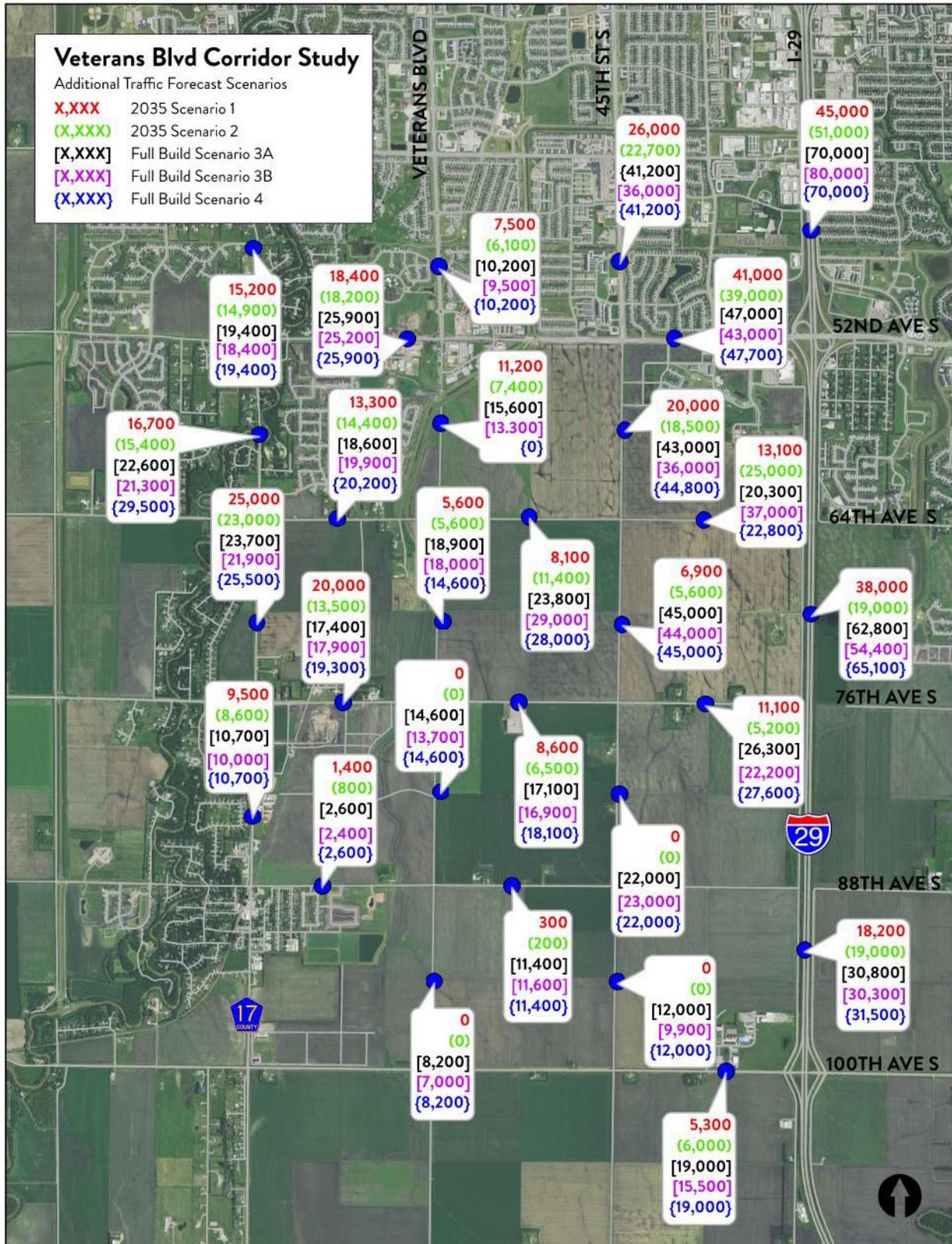


Table 8: Veterans Boulevard Traffic Forecasts

Segment of Veterans Boulevard	Average Daily Traffic Volumes by Scenario				
	2035 Scenario 1	2035 Scenario 2	Full Build Scenario 3A	Full Build Scenario 3B	Full Build Scenario 4
<b>40<sup>th</sup> Avenue to 52<sup>nd</sup> Avenue</b>	7,500	6,100	10,200	9,500	10,200
<b>52<sup>nd</sup> Avenue to 64<sup>th</sup> Avenue</b>	11,200	7,400	15,600	13,300	0
<b>64<sup>th</sup> Avenue to 76<sup>th</sup> Avenue</b>	5,600	5,600	18,900	18,000	14,600
<b>76<sup>th</sup> Avenue to 88<sup>th</sup> Avenue</b>	N/A	N/A	14,600	13,700	14,600
<b>88<sup>th</sup> Avenue to 100<sup>th</sup> Avenue</b>	N/A	N/A	8,200	7,000	8,200

## SUMMARY

Based on the traffic forecasts, a two-lane with turn lanes or a three-lane facility along Veterans Boulevard would be expected to provide adequate capacity for the foreseeable future and likely accommodate the full-build condition as the area is fully developed and the transportation network is built out. However, preservation of right-of-way for future expansion to a four- or five-lane facility should be considered depending on the future vision of the corridor and the street typology desired to serve adjacent land use. Furthermore, having a continuous north-south connection along Veterans Boulevard helps minimize any diversion to adjacent corridors and provides good roadway continuity in the area. Specific roadway geometry and traffic controls will be evaluated as part of the alternative intersection capacity evaluation.

## **CHAPTER 4. ALTERNATIVE INTERSECTION CAPACITY EVALUATION**

## INTRODUCTION

Future conditions were evaluated to determine the long-term traffic control and roadway geometry needs of Veterans Boulevard between 40th Avenue South to 100th Avenue South. Traffic forecasts along Veterans Boulevard were developed for multiple transportation network and socio-economic scenarios. The assumptions, methodology, and results of the traffic forecasts development process are summarized in the [\*Traffic Forecast Summary Report\*](#).

Key study locations include the existing intersections along Veterans Boulevard between 40<sup>th</sup> Avenue South and 52<sup>nd</sup> Avenue South, as well as future intersections expected between 52<sup>nd</sup> Avenue South and 100<sup>th</sup> Avenue South. The future intersections include 64th Avenue South, 76th Avenue South, 88th Avenue South, and 100th Avenue South. The following information provides an overview of the future intersection capacity analysis and the necessary traffic control and geometric recommendations for the corridor.

## INTERSECTION CAPACITY ANALYSIS

### Peak Hour Traffic Volumes

Based on discussions with the Study Review Committee (SRC), Full Build Scenario 3B traffic forecasts were used as the basis for the alternative intersection capacity analysis. These Average Daily Traffic (ADT) volume forecasts were used to develop the a.m. and p.m. peak hour turning movement counts. The development process is based on existing turning movement counts (where available), projected ADT volumes, and expected travel patterns derived from the regional travel demand model. A calibration process was then leveraged to ensure the peak hour to ADT volume ratios were in line with typical thresholds in the study area. This process is consistent with the existing conditions methodology used to verify the existing turning movement counts and StreetLight user data. The future Full Build Scenario 3B intersection turning movement counts and estimated ADT volumes are shown in Figure 36.

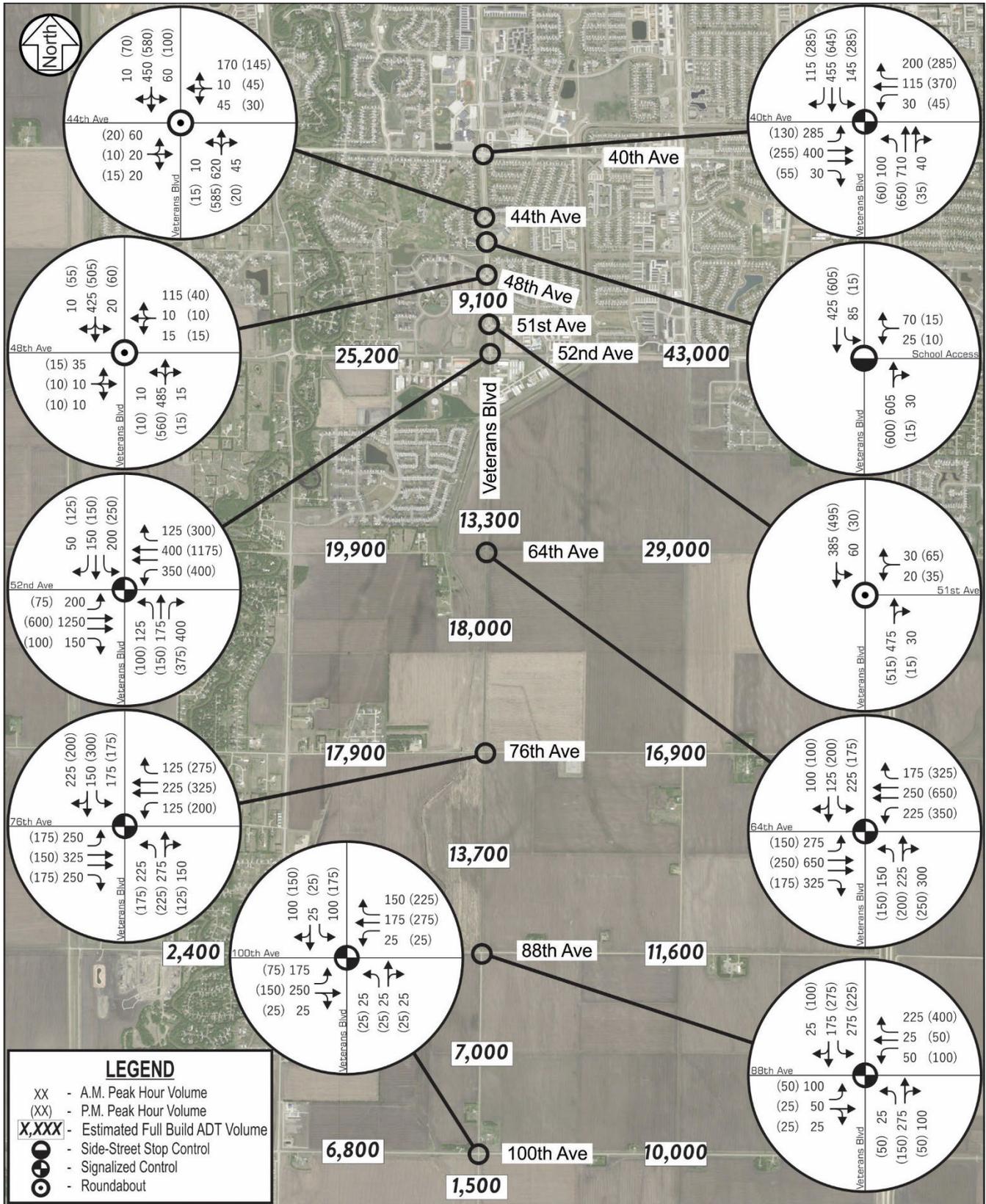
### Roadway Network Assumptions

In coordination with the SRC, the following general roadway network assumptions were identified and incorporated as part of the preliminary future alternative intersection capacity analysis.

- » Veterans Boulevard would be a three-lane facility (i.e. two-lane with left-turn lanes); no right-turn lanes were assumed along Veterans Boulevard to understand the need based on intersection capacity.
- » 40<sup>th</sup> Avenue South Intersection - two (2) southbound through lanes and a new southbound right-turn lane were included to address the existing safety issues tied to the existing southbound trap condition.
- » 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South are four-lane facilities with right- and left-turn lanes.
- » 88th Avenue South and 100<sup>th</sup> Avenue South are three-lane facilities with right- and left-turn lanes, except for an eastbound right turn lane in each of these locations.

These assumptions helped establish a baseline future condition to determine if additional geometric and/or traffic control infrastructure would be needed along the corridor.

Figure 36: Full Build Scenario 3B Traffic Volumes



## Alternatives

Three preliminary alternatives were developed by KLJ for the Veterans Boulevard corridor. These alternatives were reviewed, and a future intersection capacity analysis was completed to understand how each intersection within the study area would be expected to operate under different traffic controls. This approach was leveraged to allow for a quick comparison between intersection operations, traffic controls, and geometric needs. At each new intersection between 64<sup>th</sup> Avenue South and 100<sup>th</sup> Avenue South, the following traffic controls were reviewed.

- » Side Street Stop Control
- » All Way Stop Control
- » Traffic Signal
- » Roundabout

Since the three preliminary alternatives developed are generally related to traffic control variations or minor alignment changes, the project team reviewed each intersection independently. This allows for a better understanding of individual intersection operations, as well as preserves the ability to refine the alternatives to ensure safe and efficient operations. Note that the 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue roundabout analysis was completed assuming single lane approaches along Veterans Boulevard and two lane approaches along 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South. The roundabout analysis at 88<sup>th</sup> Avenue South and 100<sup>th</sup> Avenue South assumed single lane roundabouts.

## Traffic Operations

The intersection capacity analysis was once again conducted using a combination of Synchro/SimTraffic and the Highway Capacity Software (HCS). The capacity analysis focused on the future a.m. and p.m. peak hours. As noted in the existing conditions report, capacity analysis results identify a Level of Service (LOS), which is a term used to describe the operational performance of transportation infrastructure elements. LOS A represents free flow traffic whereas LOS F represents gridlock. LOS E and F are considered deficient, in accordance with the NDDOT *Traffic Operations Manual* published in June 2015.

Results of the future build scenario intersection capacity analysis for the a.m. and p.m. peak hours are shown in Table 9 and Table 10, respectively. The findings indicate that the existing intersections along Veterans Boulevard between 40<sup>th</sup> Avenue South and 52<sup>nd</sup> Avenue South are expected to operate at an acceptable overall LOS D or better. Therefore, no capacity improvements are needed at the existing intersections to support the future forecasts. However, as noted earlier, an additional southbound through lane and a new southbound right-turn lane should be added at 40<sup>th</sup> Avenue South to eliminate the right-turn trap condition, which is causing driver confusion and safety concerns.

At the future primary intersections along Veterans Boulevard between 64<sup>th</sup> Avenue South to 100<sup>th</sup> Avenue South, the capacity analysis results indicate a higher level of traffic control (i.e., beyond side-street stop control) is expected to be needed at the majority of the study intersections. The following section provides more detail regarding specific geometric and traffic control considerations and recommendations for the corridor. Detailed capacity analysis results are in the Appendix.

Table 9: Future Build Year Scenario 3B A.M. Peak Hour Capacity Analysis

Existing Intersections	North Leg (Southbound)		East Leg (Westbound)		South Leg (Northbound)		West Leg (Eastbound)		Overall	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Veterans Boulevard / 40 <sup>th</sup> Avenue	C	25 sec.	C	26 sec.	C	31 sec.	C	32 sec.	C	29 sec.
Veterans Boulevard / 44 <sup>th</sup> Avenue	A	7 sec.	B	11 sec.	B	11 sec.	A	6 sec.	B	10 sec.
Veterans Boulevard / School Access	A	2 sec.	C	22 sec.	A	0 sec.	-	-	A	2 sec.
Veterans Boulevard / 48 <sup>th</sup> Avenue	A	6 sec.	A	7 sec.	A	7 sec.	A	5 sec.	A	7 sec.
Veterans Boulevard / 51 <sup>st</sup> Avenue	A	6 sec.	A	5 sec.	A	7 sec.	-	-	A	7 sec.
Veterans Boulevard / 52 <sup>nd</sup> Avenue	D	53 sec.	D	45 sec.	D	37 sec.	D	49 sec.	D	46 sec.
New Intersections			Side Street Stop		All Way Stop		Traffic Signal		Roundabout	
Veterans Boulevard / 64 <sup>th</sup> Avenue			F/F	>3min.	F	>3min.	D	38 sec.	F	86 sec.
Veterans Boulevard / 76 <sup>th</sup> Avenue			A/F	>3min.	F	>3min.	C	21 sec.	D	29 sec.
Veterans Boulevard / 88 <sup>th</sup> Avenue			F/F	>3min.	D	34 sec.	B	19 sec.	A	9 sec.
Veterans Boulevard / 100 <sup>th</sup> Avenue*			B/D	30 sec.	B	14 sec.	B	15 sec.	A	7 sec.

\* Veterans Boulevard was assumed to be the stop condition at this location.

Table 10: Future Build Year Scenario 3B P.M. Peak Hour Capacity Analysis

Existing Intersections	North Leg (Southbound)		East Leg (Westbound)		South Leg (Northbound)		West Leg (Eastbound)		Overall	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Veterans Boulevard / 40 <sup>th</sup> Avenue	C	29 sec.	D	37 sec.	D	43 sec.	C	31 sec.	C	34 sec.
Veterans Boulevard / 44 <sup>th</sup> Avenue	B	12 sec.	B	10 sec.	B	10 sec.	A	6 sec.	B	11 sec.
Veterans Boulevard / School Access	A	1 sec.	C	19 sec.	A	0 sec.	-	-	A	1 sec.
Veterans Boulevard / 48 <sup>th</sup> Avenue	A	8 sec.	A	6 sec.	A	8 sec.	A	5 sec.	A	8 sec.
Veterans Boulevard / 51 <sup>st</sup> Avenue	A	7 sec.	A	6 sec.	A	7 sec.	-	-	A	7 sec.
Veterans Boulevard / 52 <sup>nd</sup> Avenue	C	34 sec.	D	37 sec.	C	20 sec.	C	31 sec.	C	34 sec.
New Intersections			Side Street Stop		All Way Stop		Traffic Signal		Roundabout	
Veterans Boulevard / 64 <sup>th</sup> Avenue			F/F	>3min.	F	>3min.	C	33 sec.	E	39 sec.
Veterans Boulevard / 76 <sup>th</sup> Avenue			A/F	>3min.	F	>3min.	C	26 sec.	D	28 sec.
Veterans Boulevard / 88 <sup>th</sup> Avenue			D/F	>3min.	E	39 sec.	B	16 sec.	B	11 sec.
Veterans Boulevard / 100 <sup>th</sup> Avenue*			B/D	27 sec.	C	16 sec.	B	11 sec.	A	8 sec.

\* Veterans Boulevard was assumed to be the stop condition at this location.

As previously noted, the roundabouts evaluated along Veterans Boulevard at 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue south were assumed to have single lane approaches along Veterans Boulevard and two-lane approaches along 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South. The results of the intersection capacity analysis shown in Table 9 and Table 10 indicate that the 64<sup>th</sup> Avenue South intersection is expected to operate at LOS F and LOS E during the a.m. and p.m. peak hours, respectively. The intersection at 76<sup>th</sup> Avenue South is expected to operate at LOS D during the peak hours, although the operations are approaching the LOS D/LOS E threshold and the north and south approaches are expected to operate at LOS F during the peak hours. Therefore, an additional analysis was conducted to understand the benefit of adding northbound and southbound right-turn bypass lanes along Veterans Boulevard at both 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South.

Results of the additional analysis, shown in Table 11, indicate that with the addition of the northbound and southbound right-turn bypass lanes along Veterans Boulevard at 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South, each of these intersections would be expected to operate at LOS D or better during the peak hours. Therefore, the northbound and southbound bypass lanes should be incorporated for consideration into the alternatives. Note that the bypass lanes could be added at a later date if needed, but the right-of-way and roundabout designs should be designed as to not preclude these lanes from being implemented.

Table 11: Future Build Year Scenario 3B Results Comparison

Veterans Boulevard Intersections	A.M. Peak Hour						P.M. Peak Hour					
	Traffic Signal		Roundabout		Roundabout with Bypass*		Traffic Signal		Roundabout		Roundabout with Bypass*	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
64 <sup>th</sup> Avenue S	D	38 sec	F	86 sec	D	27 sec	C	33 sec	E	39 sec	D	25 sec
76 <sup>th</sup> Avenue S	C	21 sec	D	29 sec	B	14 sec	C	26 sec	D	28 sec	B	13 sec

\* Assumes 2-lane east-west approaches and northbound-southbound right-turn bypass lanes.

## Geometric and Traffic Control Considerations

Based on the capacity analysis, there are multiple geometric and traffic control options that can support the future traffic forecasts. The following summary provides key findings, considerations, and recommendations.

- » 64th Avenue South – the intersection is not expected to operate acceptably under stop control or as a 2x1 hybrid multilane roundabout (i.e., 2-lanes east-west; 1-lane north-south). However, the traffic signal and multilane roundabout options (i.e., 2-lanes on each approach, with the additional lanes on the north and south approaches as right-turn bypass lanes) are expected to provide LOS D operations or better. Note that although not a significant operational benefit, northbound and southbound right-turn lanes should be considered for safety purposes under the signal alternative.

**Recommendation: Consider a traffic signal or multilane roundabout. If a signal option is selected, consider the addition of northbound and southbound right-turn lanes for safety. If a roundabout is selected, consider building as a 2x1 configuration, with the possibility to add northbound and southbound right-turn bypass lanes.**

- » 76<sup>th</sup> Avenue South – the intersection is not expected to operate acceptably under stop control. However, the traffic signal and multilane roundabout options (i.e. 2-lanes on each approach, with the additional lanes on the north and south approaches as right-turn bypass lanes) are expected to provide LOS C operations or better with no failing approaches. A complete 2x2 multilane roundabout is not needed from a capacity perspective.

**Recommendation: Consider a traffic signal or multilane roundabout. If a signal option is selected, consider the addition of northbound and southbound right-turn lanes for safety. If a roundabout is selected, consider building as a 2x1 configuration, with the possibility to add northbound and southbound right-turn bypass lanes.**

- » 88<sup>th</sup> Avenue South - the intersection is not expected to operate acceptably with side-street stop or all-way stop control during the peak hours; however, this intersection is expected to operate near the acceptable threshold during the peak hours with all-way stop control. A traffic signal or single lane roundabout would provide LOS B operations or better.

**Recommendation: Monitor intersection operations and volumes into the future and determine if/when a higher level of traffic control (i.e., an all-way stop, signal, or roundabout) is warranted. Consider preserving the necessary right-of-way to allow for a future roundabout.**

- » 100th Avenue South - the intersection is expected to operate acceptably with side-street stop control if the Veterans Boulevard approaches were stop controlled and 100th Avenue was uncontrolled.

**Recommendation: Monitor intersection operations and volumes into the future and determine if/when a higher level of traffic control (i.e., an all-way stop, signal, or roundabout) is warranted. Consider preserving the necessary right-of-way to allow for a future roundabout.**

## OTHER CONSIDERATIONS

### Veterans Boulevard Southbound Transition

With the potential changes at the 40<sup>th</sup> Avenue South intersection, the SRC discussed how best to transition Veterans Boulevard between 40<sup>th</sup> Avenue South and 44<sup>th</sup> Avenue South in the southbound direction. Two potential options were investigated, including:

- » Option 1 - transition southbound from 2-lanes to 1-lane approximately 500 feet south of 40th Avenue South. This would provide sufficient distance for motorists to safely complete the merge maneuver, while also effectively allowing better utilization of both southbound through lanes at 40th Avenue South.
- » Option 2 – utilize the roundabout at 44<sup>th</sup> Avenue South as the southbound transition from 2-lanes to 1-lane. This would result in two southbound lanes along Veterans Boulevard between 40<sup>th</sup> Avenue South and 44<sup>th</sup> Avenue South, while providing the transition at a more controlled and slower speed environment. However, the additional lane at the roundabout would increase the pedestrian crossing distance.
- If this option were to move forward, the southbound lane configuration that would best serve current travel patterns would be to have a dedicated left-turn lane and a shared through/right-turn lane for the southbound approach into this roundabout.

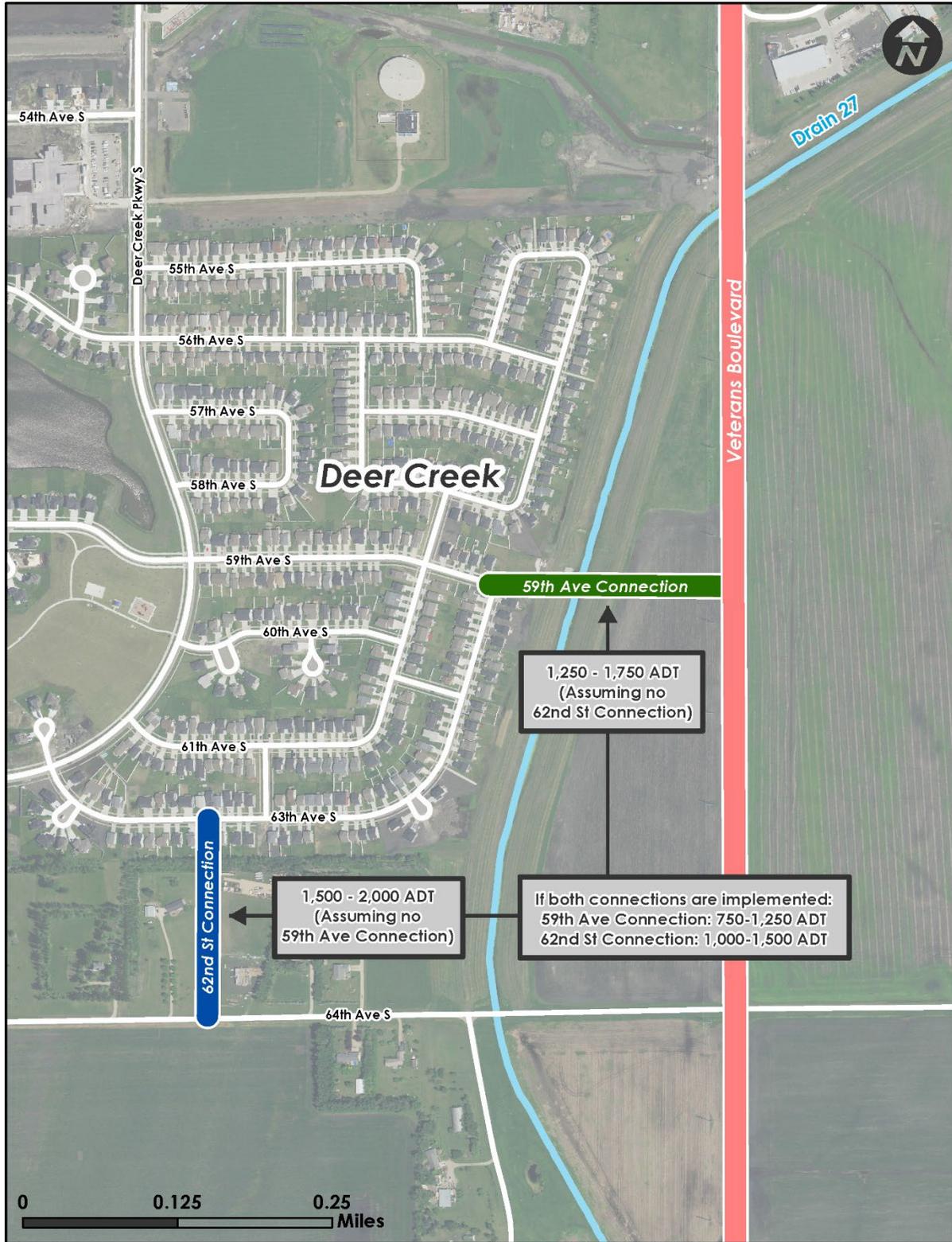
**Recommendation: Incorporate Option 1 into the plan.**

### Deer Creek Neighborhood Connection

Preliminary alternatives include the potential extension of 59<sup>th</sup> Avenue South to connect between the Deer Creek Neighborhood and Veterans Boulevard. This connection would provide an additional access to the neighborhood, which would help improve emergency vehicle access and reduce travel along 63<sup>rd</sup> Street South. A preliminary investigation was conducted to understand traffic volumes associated with a potential 59<sup>th</sup> Avenue South connection. This evaluation also included a scenario with and without a neighborhood connection between 63<sup>rd</sup> Avenue South and 64<sup>th</sup> Avenue South, which is currently platted. This evaluation identified the following:

- » There are approximately 250 to 300 homes that could be expected to change their travel patterns if a new connection were made to Veterans Boulevard via the extension of 59<sup>th</sup> Avenue South; this level of homes represents an average of approximately 2,500 to 3,000 daily vehicles trips.
  - Since not all of these 250 to 300 homes would choose the new route given the travel times would be relatively similar to using either 59<sup>th</sup> Avenue South or 63<sup>rd</sup> Street South, approximately 125 to 175 homes would realistically use the new 59<sup>th</sup> Avenue South connection. This represents 1,250 to 1,750 daily trips or approximately 125 to 175 peak hour trips.
- » There are approximately 300 to 350 homes that could be expected to change their travel patterns if a new connection were made between 63<sup>rd</sup> Avenue South and 64<sup>th</sup> Avenue South via the platted connection; this level of homes represents an average of approximately 3,000 to 3,500 daily vehicles trips.
  - Since not all of the 300 to 350 homes would choose the new route given area travel times and patterns, approximately 150 to 200 homes would realistically use this roadway connection (assuming no 59<sup>th</sup> Avenue South extension). This represents 1,500 to 2,000 daily trips or approximately 150 to 200 peak hour trips.
- » If both the 59<sup>th</sup> Avenue South extension and the connection between 63<sup>rd</sup> Avenue South and 64<sup>th</sup> Avenue South were implemented, each of these roadways would be expected to see their respective volumes noted decrease by about 500 to 750 daily trips or 50 to 75 peak hour trips. Expected volumes along these roadways with both roadways in place would be as follows:
  - 59<sup>th</sup> Street South Extension – 750 to 1,250 daily trips
  - 63<sup>rd</sup> Avenue South to 64<sup>th</sup> Avenue South Connection – 1,000 to 1,500 daily trips

Figure 38. Deer Creek Connection Forecasted Traffic Volumes



## **CHAPTER 5. PURPOSE AND NEED**

## INTRODUCTION

The Veterans Boulevard Corridor Extension (project) includes a north-south roadway connection between 40<sup>th</sup> and 100<sup>th</sup> Avenue South in the southwest Fargo-Moorhead Metropolitan Area. Currently, Veterans Boulevard runs from the I-94 interchange, south to 52<sup>nd</sup> Avenue South. A portion of the existing corridor (between 40<sup>th</sup> and 52<sup>nd</sup> Avenue South) was constructed in 2009. While this section meets many of today's vehicular and multimodal needs, concerns have arisen over the years and as part of this study - namely the need to improve the functionality of the roundabouts along this section. In addition, significant growth in the southwest area of the Fargo-Moorhead Metro will require additional roadway network connectivity. Therefore, this project seeks to improve Veterans Boulevard between 40<sup>th</sup> and 52<sup>nd</sup> Avenue South, and extend the corridor to 100<sup>th</sup> Avenue South.

Veterans Boulevard is currently unclassified, as the Fargo-Moorhead Metropolitan Council of Governments (Metro COG) and North Dakota Department of Transportation (NDDOT) have not updated their functional classification maps since 2007. However, they are currently updating their maps, and it is anticipated that Veterans Boulevard will be classified as a minor arterial.

## PURPOSE AND NEED STATEMENT

The project is needed to improve the safety of Veterans Boulevard, address existing concerns between 40<sup>th</sup> and 52<sup>nd</sup> Avenue South, and address the anticipated new residential development in the southwest Fargo-West Fargo- Horace area. The purpose of the project is to provide a safer, more efficient, and more livable multimodal connection between 40<sup>th</sup> and 100<sup>th</sup> Avenue South.

## NEED FOR PROJECT

### Capacity

Traffic operations were analyzed along the existing Veterans Boulevard corridor. Intersection capacity along the corridor was evaluated for delay and level of service (LOS). Under current traffic conditions, all existing intersections operate at 'LOS C' or better during the a.m. and p.m. peak hours, which is considered acceptable. However, there were some queuing issues identified at the Veterans Boulevard/40<sup>th</sup> Avenue South intersection.

'LOS A' represents free flow traffic, whereas 'LOS F' represents gridlock. 'LOS E' and 'LOS F' are considered deficient.

### *Future Capacity Needs*

Several future build scenarios with varying roadway configurations and intersection controls were analyzed to forecast capacity needs on Veterans Boulevard in 2035 and 2045 (see Table 12). Results of the future capacity analysis indicate traffic operations along the existing corridor are expected to operate at 'LOS C' or better. Traffic operations along the proposed extended corridor, specifically, at the four new major intersections (i.e., 64<sup>th</sup>, 76<sup>th</sup>, 88<sup>th</sup>, and 100<sup>th</sup> Avenue South) are expected to operate at 'LOS C' or better when controlled with traffic signals or two-lane roundabouts. Recommendations in the analysis indicate that an extension of Veterans Boulevard should include a two-lane roadway with turn lanes or a three-lane roadway in order to provide adequate capacity for the future needs.

Table 12. Veterans Boulevard Traffic Forecasts

Segment of Veterans Boulevard	Average Daily Traffic Volumes by Scenario								
	2035 MTP	2035 Scenario 1	2035 Scenario 2	2045 MTP	Full Build	Full Build TOD	Full Build Scenario 3A	Full Build Scenario 3B	Full Build Scenario 4
40 <sup>th</sup> Avenue to 52 <sup>nd</sup> Avenue	5,100	7,500	6,100	9,900	10,800	11,500	10,200	9,500	10,200
52 <sup>nd</sup> Avenue to 64 <sup>th</sup> Avenue	17,500	11,200	7,400	21,000	22,200	24,700	15,600	13,300	0
64 <sup>th</sup> Avenue to 76 <sup>th</sup> Avenue	24,000	5,600	5,600	37,000	43,700	44,900	18,900	18,000	14,600
76 <sup>th</sup> Avenue to 88 <sup>th</sup> Avenue	17,600	N/A	N/A	25,000	28,000	28,400	14,600	13,700	14,600
88 <sup>th</sup> Avenue to 100 <sup>th</sup> Avenue	15,300	N/A	N/A	19,300	21,700	22,300	8,200	7,000	8,200

Key: MTP = Metropolitan Transportation Plan; TOD = Transit-Oriented Development

## System Linkage

The project would provide critical connectivity to support residential growth in the southwest Fargo-Moorhead Metropolitan Area. The *Horace Comprehensive and Transportation Plan* (City of Horace 2045)<sup>2</sup> states that future land use along Veterans Boulevard includes residential development north and south of 88<sup>th</sup> Avenue South. The project would also include east-west roadway connections to Veterans Boulevard, which would provide access to new residential development and existing residential neighborhoods, such as the Deer Creek neighborhood. In addition to improving connectivity for vehicles, the project would construct a shared-use path parallel to the proposed corridor, linking existing non-motorized facilities to the southwest Fargo-Moorhead Metropolitan Area.

In addition to providing connections to new land uses, several future roadway projects would benefit from the project. As shown in the Metro COG 2021-2024 Transportation Improvement Program, the new County Road 6 on the existing 45<sup>th</sup> Street South and 76<sup>th</sup> Avenue South will intersect with the corridor extension. In the Fargo-Moorhead Metropolitan Transportation Plan, Metro Grow, a portion of the project between 52<sup>nd</sup> and 64<sup>th</sup> Avenue South is listed as a roadway project anticipated for construction between 2026 and 2029.

## Transportation Demand

### Existing Vehicle Demand

To account for a reduction in typical traffic due to the COVID-19 pandemic and significant construction in the southwest Fargo-Moorhead Metropolitan Area, the following sources were used to ensure the most accurate traffic data was used to assess existing vehicle demand.

<sup>2</sup>City of Horace. 2045. *Horace Comprehensive and Transportation Plan*. Available online <http://cityofhorace.com/2249/Horace-2045-Comprehensive-Plan>

- » Historical average daily traffic (ADT) volumes provided by NDDOT.
- » 2018 intersection (Miovision) turning movement counts collected by NDDOT.
- » StreetLight user data.

Results of the traffic analysis indicate that the ADT on the existing Veterans Boulevard corridor, ranges from 3,000 vehicles per day between 48<sup>th</sup> and 52<sup>nd</sup> Avenue South and 6,500 vehicles per day between 40<sup>th</sup> and 44<sup>th</sup> Avenue South.

### *Pedestrian and Bicyclist Demand*

The Fargo-Moorhead Metropolitan Area has an extensive dedicated path system; however, there are no north-south facilities south of 52<sup>nd</sup> Avenue South or west of I-29. Currently, there are shared-use paths on both sides of Veterans Boulevard between 40<sup>th</sup> and 52<sup>nd</sup> Avenue South, with pedestrian crossings at the roundabouts. The project would add dedicated pedestrian/bicyclist facilities parallel to the roadway, connecting Horace and Fargo. During the public engagement phase, the majority of the public indicated they preferred dedicated bicycle and pedestrian facilities to be included as part of the project. A future bicycle and pedestrian connection is also expected to be constructed parallel to Drain 27, which could be accessed via the Veterans Boulevard extension.

### Social Demands or Economic Development

As previously noted, future land use along Veterans Boulevard includes residential development with a mix of mixed commercial uses at arterial intersections. The City of Horace anticipates 100 to 150 new households per year for the next 25 years, or approximately 2,500 to 3,500 new households by 2045. Additionally, with the planned construction of Heritage Middle School and Horace High School, additional residential development is likely. The project would connect future residences to schools as well.

### Modal Interrelationships

The Fargo-Moorhead Metropolitan Area, including Fargo, West Fargo, Moorhead, and Dilworth, is served by Metro Area Transit of Fargo-Moorhead (MATBUS). Currently, Route 18 serves Veterans Boulevard, running on an hourly schedule between 6 a.m. to 10:15 p.m., with dedicated stops at the corner of 40<sup>th</sup> and 44<sup>th</sup> Avenue South. During the public engagement phase, the majority of the public indicated they preferred the corridor extension to have additional MATBUS stops (e.g., corners, platforms, shelters, benches) included as part of the project.

### Safety

A crash analysis was completed for a portion of the existing Veterans Boulevard corridor (i.e., from 40<sup>th</sup> to 52<sup>nd</sup> Avenue South) to identify any trends, hotspots, or contributing factors. Three years of crash history was provided by NDDOT, which included data from January 1, 2017, through December 31, 2019. During that timeframe, there were a total of 36 crashes reported between 40<sup>th</sup> and 52<sup>nd</sup> Avenue South. The following overall trends were identified:

- » Majority of crashes (i.e., 89 percent) occurred at 40<sup>th</sup> or 44<sup>th</sup> Avenue South intersections.
- » Angle and rear-end crashes were predominant crash types (i.e., 70 percent).
- » No fatal crashes, but there was one incapacitating injury.
- » One bicycle crash reported; no pedestrian crashes.

A critical crash rate analysis was used to determine if differences between observed crash rates and typical crash rates are statistically significant and attributable to roadway design or traffic control. The analysis calculates location-specific crash rates and compares those rates against similar facilities. Minnesota Department of Transportation (MnDOT) data was used for this analysis, the results of which are shown in Table 13. Values highlighted in red exceed the critical crash rate while values highlighted in yellow exceed the average crash rate.

Table 13. Existing Crash and Severity Rate Comparison

Intersection	Traffic Control	Crash Rates			Severity Rates		
		Actual	Average*	Critical*	Actual	Average*	Critical*
Veterans Boulevard / 40 <sup>th</sup> Avenue	Signal	0.88	0.52	0.95	0.00	0.44	4.58
Veterans Boulevard / 44 <sup>th</sup> Avenue	Roundabout	1.53	0.32	0.88	11.78	0.31	8.65
Veterans Boulevard / School Access	Stop	0.00	0.19	0.73	0.00	0.36	12.10
Veterans Boulevard / 48 <sup>th</sup> Avenue	Roundabout	0.00	0.32	1.01	0.00	0.36	11.75
Veterans Boulevard / 51 <sup>st</sup> Avenue	Roundabout	0.46	0.32	1.13	0.00	0.31	15.14
Veterans Boulevard / 52 <sup>nd</sup> Avenue	Stop**	0.16	0.19	0.54	0.00	0.36	6.48

\*MnDOT values

\*\*Converted to a stop-controlled intersection during the crash analysis period.

## Roadway Shortcomings

As previously noted, there are existing roadway issues and concerns (regarding roundabout functionality and crash history) between 40th and 52nd Avenue South. Therefore, this project seeks to improve Veterans Boulevard between 40th and 52nd Avenue South, and extend the corridor to 100th Avenue South. During the public engagement phase, emergency service representatives indicated they were in support of reconstructing the roundabouts between 40<sup>th</sup> and 52<sup>nd</sup> Avenue South to accommodate larger vehicles, such as ambulances and fire trucks.

## **CHAPTER 6. ALTERNATIVES DEVELOPMENT**

## INTRODUCTION

As growth and development continues in the Fargo-Moorhead area's southwest metro, a continuous corridor along the Veterans Boulevard alignment will be necessary to meet future transportation needs and access future residences, businesses and amenities. An extension of Veterans Boulevard will also help alleviate traffic on other parallel roadways such as Sheyenne Street/CR 17 and 45th Street. The study area includes existing portions of Veteran's Boulevard and a proposed extension of the corridor from 52<sup>nd</sup> Avenue to 100<sup>th</sup> Avenue South.

Options have been developed to improve the existing roundabouts at the 44<sup>th</sup>, 48<sup>th</sup> and 51<sup>st</sup> Street intersections along Veterans Boulevard. Built over 10 years ago, enhancements are needed at these intersections to improve traffic flow, manage pedestrian safety and roadway maintenance.

The extension of Veterans Boulevard has the potential to serve many functions. Besides accommodating vehicular traffic, the corridor has the potential to provide a safe and inviting environment for pedestrians and bicycle users, accommodate future transit, and can be an amenity for future neighborhoods, parks, and businesses. Three corridor-level alternatives were developed to provide a framework of options to allow for the extension and buildout of the Veterans Boulevard Corridor from 52<sup>nd</sup> Avenue to 100<sup>th</sup> Avenue. In addition, new connections with the Deer Creek neighborhood have been evaluated. This chapter is organized within the following sections:

- » **Improvements to Existing Corridor:** Discusses proposed improvements to address issues and concerns along the existing corridor.
- » **Extension Alignment Alternatives:** Presents the three alignment options evaluated for a Veterans Boulevard corridor extension.
- » **Extension Corridor Alternatives:** Presents the three corridor-level alternatives developed for a Veterans Boulevard extension.
- » **Deer Creek Connection:** Presents the two alternatives for potential connections to the Deer Creek neighborhood.
- » **Public Input:** Summarizes the results of public engagement regarding the study alternatives.
- » **Cost Estimate Summary:** Provides a summary of planning-level cost estimates for the study alternatives.
- » **Public Art:** Discusses the role of public art in creating a corridor that is enjoyable to use, has a "sense of place," and enhances the livability of the community.

## IMPROVEMENTS TO EXISTING CORRIDOR

A portion of the existing Veterans Boulevard corridor (between 40<sup>th</sup> and 52<sup>nd</sup> Avenue South) was reconstructed in 2009 and has minor roadway deficiencies. A key concern at the north of the corridor study area is safety, with the majority of crashes (i.e., 89 percent) occurring at the 40<sup>th</sup> or 44<sup>th</sup> Avenue South intersections. The crash analysis conducted during this study suggests that design aspects of the existing roundabouts, as well as queuing issues at the Veterans Boulevard/40<sup>th</sup> Avenue South intersection, may be factors contributing to the high crash rates at these locations. In addition, input received from emergency service representatives indicates that existing roundabouts do not provide sufficient space for larger vehicles, presenting challenges for ambulances and fire trucks. The study proposes improvements to address these concerns within the existing corridor.

## Veterans Boulevard Southbound Transition

As noted above, results of the crash analysis highlighted safety concerns at the Veterans Boulevard/40<sup>th</sup> Avenue South intersection. Safety issues are tied to the existing southbound right-turn trap condition at the intersection. To address these issues, the study proposes the addition of a southbound through lane and new right-turn lane. The roadway would transition from 2-lane to 1-lane approximately 500 feet south of 40<sup>th</sup> Avenue South by providing a merge lane from the new southbound through lane. The proposed southbound transition at 40<sup>th</sup> Avenue South is shown in Figure 39.

Figure 39: Veterans Boulevard Southbound Transition at 40<sup>th</sup> Avenue South



## Safe Routes to Schools Improvements

Based on recommendations in the City of Fargo Safe Routes to School Plan, there are a couple of items that should be implemented along Veterans Boulevard near the Osgood Elementary School. These items include:

- » Installing Rapid Rectangular Flashing Beacons (RRFB) at all legs of the 44th Avenue roundabout
- » Improve the signage around the school to be consistent with school speeds zones in other locations
- » Install a mid-block crossing with RRFB and curb extensions on the south side of the school to connect the shared-use path along the north side of the Rocking Horse Farms development

## Existing Roundabout Reconstruction

Analysis results and public input indicate that existing roundabouts between 40<sup>th</sup> Avenue South and 52<sup>nd</sup> Avenue South do not provide sufficient space for larger vehicles. It was also noted that the design of the roundabouts can make for excessive braking and acceleration for vehicles entering and exiting the intersections. This is a particular concern for emergency vehicle access and snow removal. To address this issue, it is recommended that existing roundabouts at 44<sup>th</sup> Avenue South, 48<sup>th</sup> Avenue South, and 51<sup>st</sup> Avenue South either have the approach roadways reconstructed to enhance the entry/exit paths or a completely reconstruction to increase the roundabout diameter from 150-feet to 180-feet. Reconstructing the approaches will allow vehicles, especially large vehicles, to navigate the roundabouts more efficiently while utilizing some of the existing roadway infrastructure. Construction of this option could be completed by closing each approach roadway individually opposed to closing the entire intersection. Reconstruction of the entire roundabout will increase the circulatory roadway diameter to 180-feet. This size was selected based on design guidance and feedback from City of Fargo that other roundabouts within the city of this size are easily navigable. Both 150-foot and 180-foot planning-level roundabout concepts were developed for each intersection. Example concepts for 44<sup>th</sup> Avenue South are shown in Figure 40 and Figure 41.

Figure 40: 180-Foot Roundabout Concept for Veterans Boulevard and 44<sup>th</sup> Avenue South



Figure 41: 150-Foot Roundabout Concept for Veterans Boulevard and 44<sup>th</sup> Avenue South



## EXTENSION ALIGNMENT ALTERNATIVES

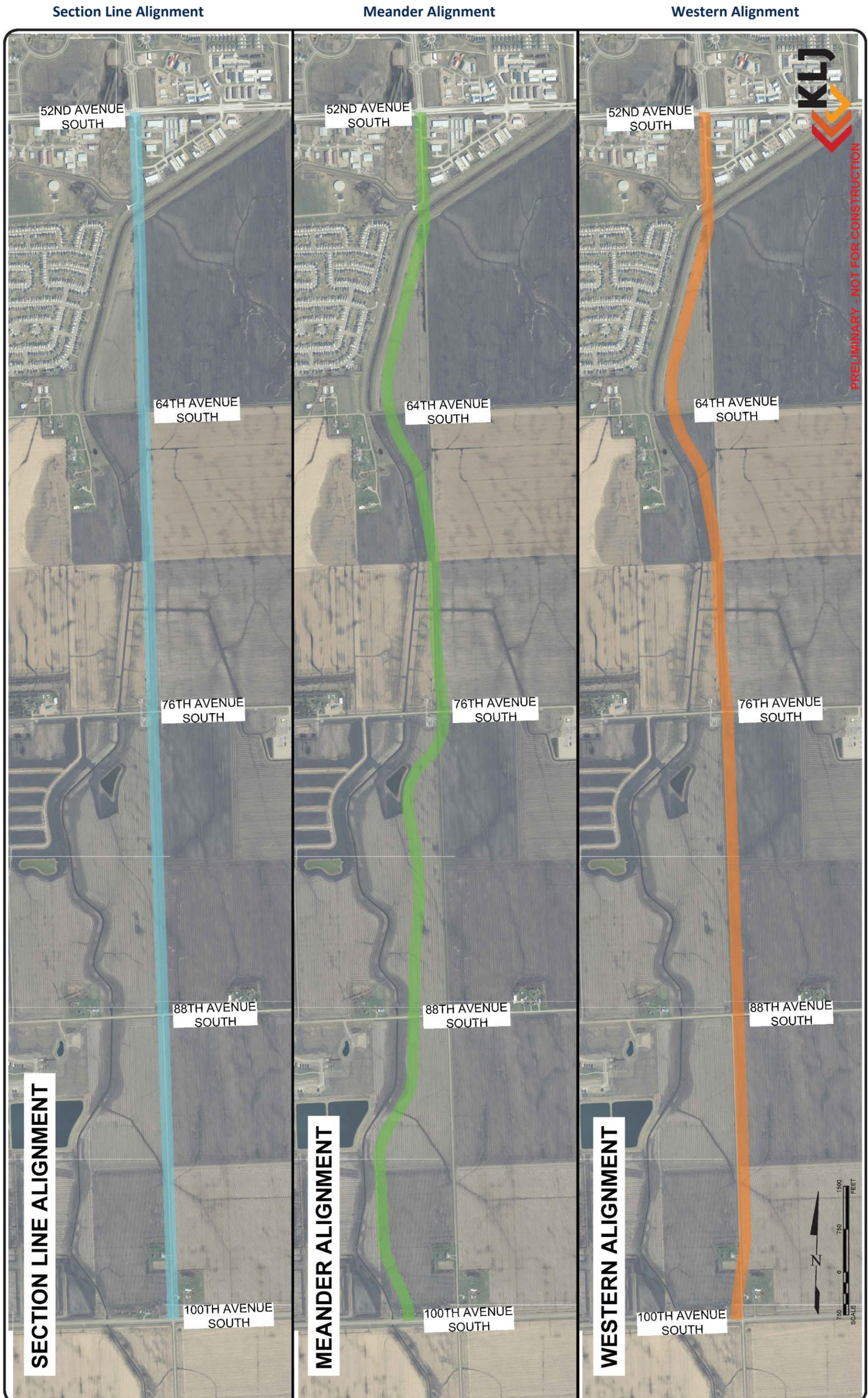
Three corridor alignment alternatives were developed in close coordination with the Study Review Committee. The alignment alternatives incorporate the benefits and constraints identified during the existing conditions analysis, as well as input collected through public engagement. A brief description of each alignment is provided below.

- » **Meander Alignment:** The Meander Alignment roughly follows the alignment of Drain 27 to the east of the section line. This alternative was developed with the intention of maximizing developable land along the corridor, and to provide a more dynamic and interesting roadway landscape. This alternative would place roughly half of the corridor extension – the portion south of 76th Avenue South – within the City of Horace.
- » **Western Alignment:** The Western Alignment generally maintains a straight path, only deviating from the section line at the north to follow the path of Drain 27 near Deer Creek. South of 64th Avenue South, the Western Alignment is offset slightly to the east of the section line, resulting in a large portion of the extension being located within the City of Fargo corporate limits.
- » **Section Line Alignment:** The Section Line Alignment follows a straight path from 52nd Avenue to 100th Avenue South. This alternative is located directly on the Fargo-Horace border for most of the alignment south of 64th Avenue South.

After detailed review and evaluation by the Study Review Committee, the Section Line Alignment was determined to be the most suitable alternative for the Veterans Boulevard extension. Central factors in this decision include the desire to share project development and corridor maintenance roles between Fargo and Horace, as well as consistency with the historical practice of aligning major corridors along section lines. This alignment also preserves parcel boundaries, as an alignment off the section line will split current quarter section

ownership. There are two alternative alignment areas that have been identified within the corridor. Between Drain 27 and 64<sup>th</sup> Avenue there is potential to shift the roadway to the east to provide additional room for development between Veterans Boulevard and the drain. If this alternative is utilized, coordination with the Southwest Fargo Stormwater Pond will be required to ensure that the two projects don't conflict. Another alternative alignment is from 100<sup>th</sup> Avenue to ½-mile north. There are currently two farmsteads, one on each side of the existing section line at this location. The alternative alignment would shift Veterans Boulevard to the east side of the eastern farmstead to avoid any impacts if the properties are intended to remain during the time of construction. The Section Line Alignment was used as a base to develop more detailed corridor options. The three corridor alignment alternatives are shown in Figure 42.

Figure 42: Veterans Boulevard Extension Corridor Alignment Alternatives



## EXTENSION CORRIDOR ALTERNATIVES

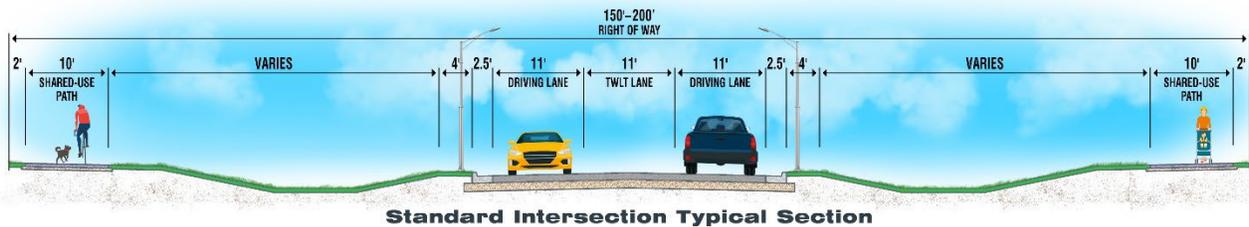
Three corridor-level alternatives were developed to support the Veterans Boulevard extension. Each alternative involves a slightly modified roadway section and intersection control features. Development of each alternative is supported through both public input gathered earlier in the planning process and through transportation planning projections for the study area. The defining features of each alternative are described below.

### Standard Intersection Alternative

#### Roadway Section

The Standard Intersection Alternative proposes a three-lane roadway with a center two-way left turn lane (TWLTL). Both the travel lanes and the TWLTL lane have a width of 11 feet. This alternative includes a 10-foot shared-use path on each side of the corridor. This alternative follows the Section Line Alignment – maintaining a straight path from 52<sup>nd</sup> Avenue to 100<sup>th</sup> Avenue – and has an assumed right-of-way of between 150 to 200 feet. This right-of-way width was based on standard right-of-way dedication practices of City of Fargo and City of Horace. All areas of the roadway within City of Fargo corporate limits include 100-feet of right-of-way from the section line, outside of the corporate limits, 75-feet of right-of-way was shown. A typical section is shown in Figure 43.

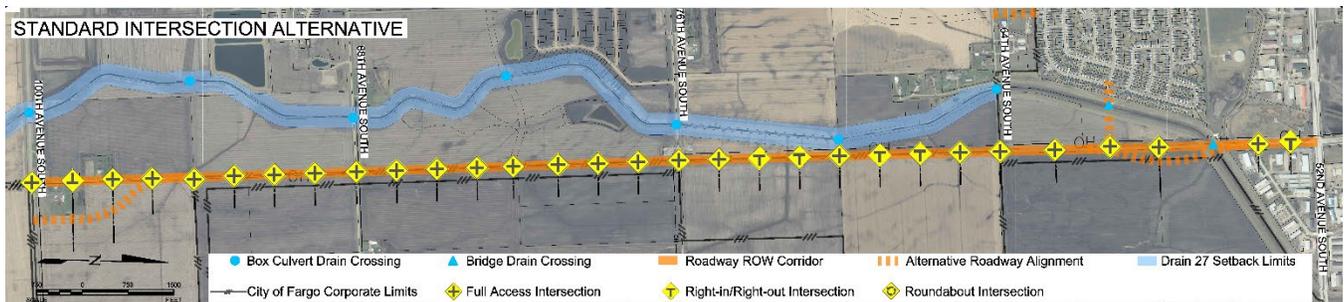
Figure 43: Standard Intersection Alternative Typical Section (Facing North)



#### Intersection Control

The Standard Intersection Alternative proposes standard signal control for primary intersections at 64<sup>th</sup> Avenue South, 76<sup>th</sup> Avenue South, and 88<sup>th</sup> Avenue South. In addition, this alternative includes minor, stop-controlled intersections every 1/8<sup>th</sup> of a mile along the corridor extension. Most minor intersections are four-legged, with the exception of T-intersections located immediately south of 52<sup>nd</sup> Avenue South, between 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South, and immediately north of 100<sup>th</sup> Avenue South. Intersection location and type for this alternative are shown in Figure 44.

Figure 44: Intersection Location and Type for the Standard Intersection Alternative



Design for the primary, signalized intersections at 64<sup>th</sup> Avenue South, 76<sup>th</sup> Avenue South, and 88<sup>th</sup> Avenue South reflect the roadway network assumptions specified in Chapter 3. Specifically, 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South are assumed to be four-lane facilities with right- and left-turn lanes. 88<sup>th</sup> Avenue South is assumed to be a three-lane facility with right- and left-turn lanes. Planning-level design concepts for the primary intersections is shown in Figure 45, Figure 46, and Figure 47.

## Roundabout Intersection Alternative

### Roadway Section

The Roundabout Intersection Alternative proposes a two-lane median-divided facility with full access every ¼-mile. The north- and southbound travel lanes have a width of 18 feet and are separated by a 16-foot median. The median is wide enough to provide full width left turn lanes at the minor approaches if deemed necessary. This alternative includes a 10-foot shared-use path on each side of the corridor. This alternative follows the Section Line Alignment – maintaining a straight path from 52<sup>nd</sup> Avenue to 100<sup>th</sup> Avenue – and has an assumed right-of-way of between 150 to 200 feet. A typical section for this alternative is shown in Figure 48.

Figure 45: Veterans Boulevard and 64<sup>th</sup> Avenue South

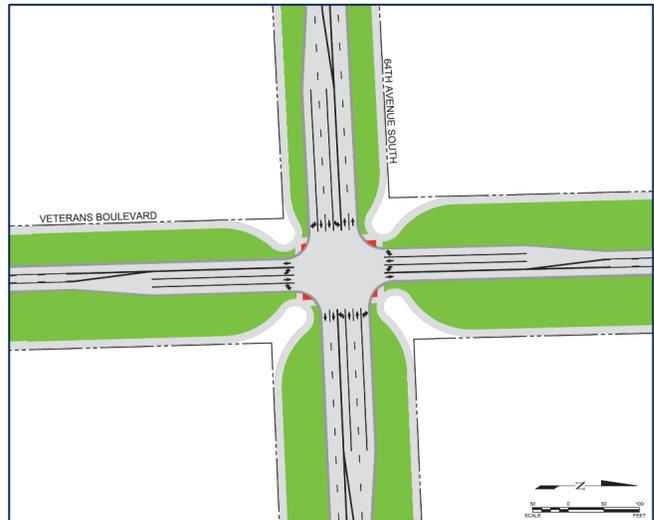


Figure 46: Veterans Boulevard and 76<sup>th</sup> Avenue South

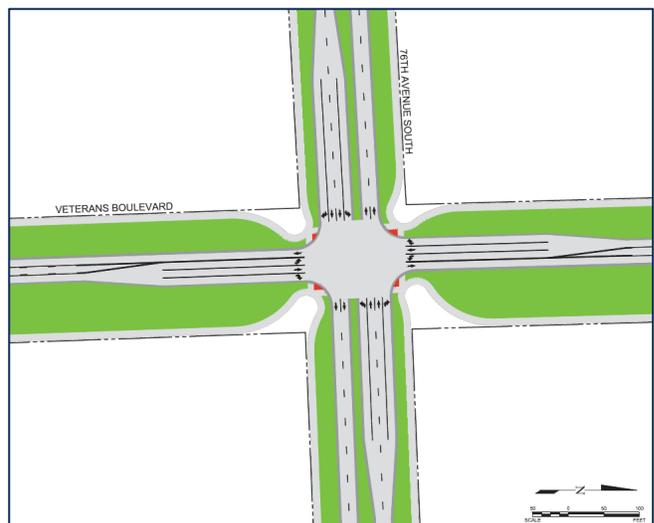


Figure 47: Veterans Boulevard and 88<sup>th</sup> Avenue South

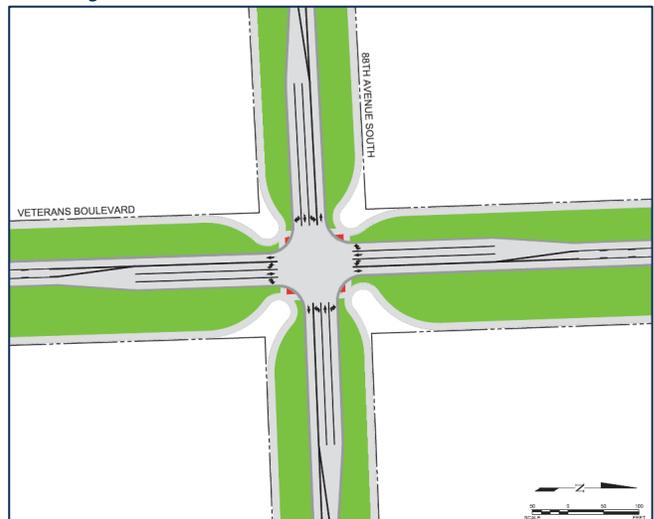
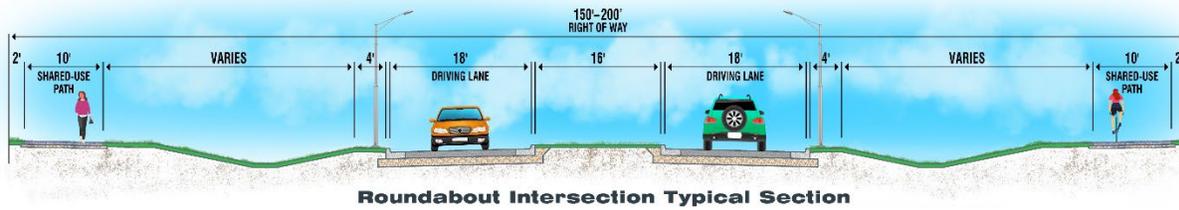


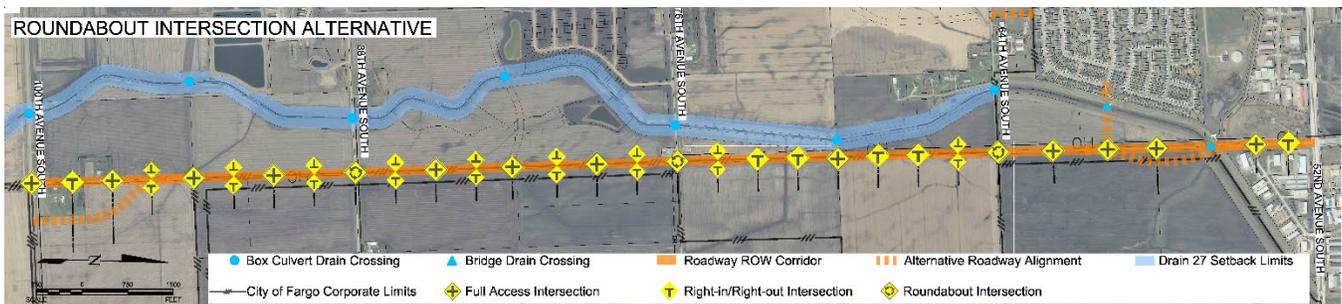
Figure 48: Roundabout Intersection Alternative Typical Section (Facing North)



### Intersection Control

The Roundabout Intersection Alternative proposes roundabouts for the primary intersections at 64<sup>th</sup> Avenue South, 76<sup>th</sup> Avenue South, and 88<sup>th</sup> Avenue South. In addition to primary intersections, this alternative accounts for minor, stop-controlled intersections every 1/8<sup>th</sup> of a mile along the corridor extension. Both full-access and right-in/right-out minor intersects are proposed to support sufficient access management along the corridor. Intersection location and type for this alternative are shown in Figure 49.

Figure 49: Intersection Location and Type for the Roundabout Intersection Alternative



As previously noted, roundabouts evaluated along Veterans Boulevard at 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South were assumed to have single lane approaches along Veterans Boulevard and two-lane approaches along 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South. The roundabout at 88<sup>th</sup> Avenue South was assumed to have all single lane approaches. Thus, the 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South intersections are designed as 2x1 hybrid multilane roundabouts (2-lanes east-west; 1 lane north-south), and the 88<sup>th</sup> Avenue South intersection is designed as a single-lane roundabout. Planning-level design concepts for the primary intersections is shown in Figure 50, Figure 51, and Figure 52.

Figure 50: Intersection of Veterans Boulevard and 64<sup>th</sup> Avenue South

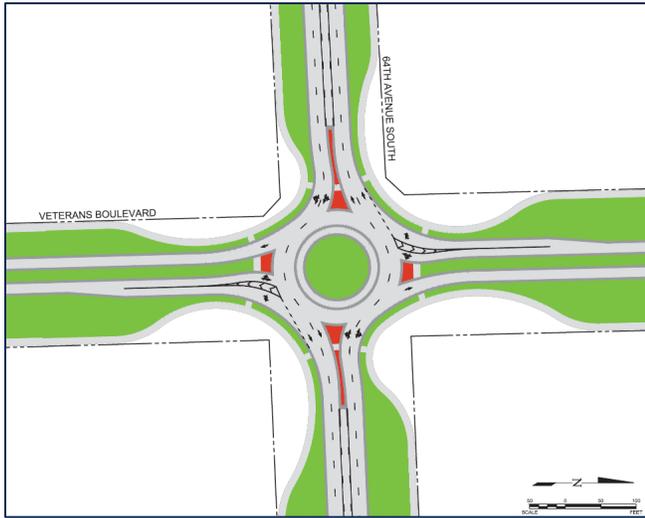


Figure 51: Intersection of Veterans Boulevard and 76<sup>th</sup> Avenue South

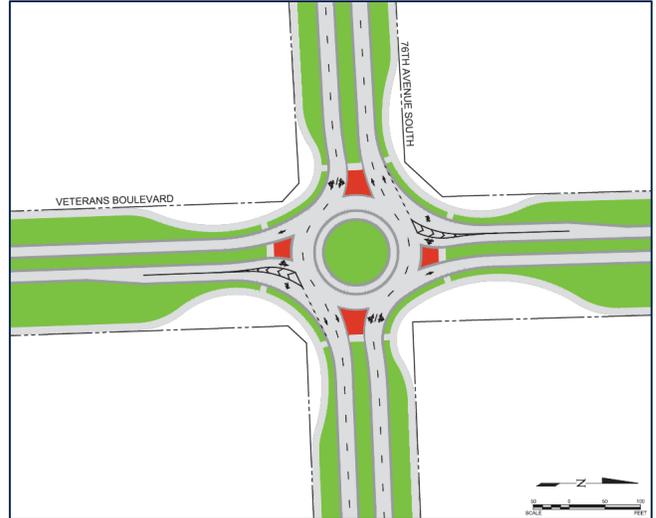


Figure 52: Intersection of Veterans Boulevard and 88<sup>th</sup> Avenue South



## Modified/Variable Alternative

### Roadway Section

The Modified/Variable Alternative proposes three distinct roadway typical sections for different segments of the corridor extension. The different typical sections are derived from public input, previous studies, and guidance from the design team.

- » **Typical Section A (52<sup>nd</sup> Avenue to 64<sup>th</sup> Avenue and 88<sup>th</sup> Avenue to 100<sup>th</sup> Avenue)** presents a three-lane roadway with one travel lane in each direction and a TWLTL. Both the travel lanes and the TWLTL lane have a width of 11 feet. This section includes a 10-foot shared-use path on each side of the corridor and has an assumed right-of-way of between 150 to 200 feet.
  - Typical Section A was assigned to these two areas based on the surrounding land use. The City of Horace has indicated that 88<sup>th</sup> Avenue to 100<sup>th</sup> Avenue will be a more industrial part of the City. Items such as enhanced greenways, adjacent commercial pedestrian access, and on-street parking will not be required for this area. Similarly, 52<sup>nd</sup> Avenue to 64<sup>th</sup> Avenue will not require any on-street parking. To the east of Veteran’s Boulevard at this location is the site of the Southwest Fargo Stormwater Pond as well as additional future residential uses. Small developable parcels are located to the west. Typical Section A is shown in Figure 53.

Figure 53: Typical Section A (Facing North)



- » **Typical Section B (76<sup>th</sup> Avenue to 88<sup>th</sup> Avenue)** presents a three-lane roadway with one travel lane in each direction and a TWLTL. Both the travel lanes and the TWLTL have a width of 11 feet. Frontage roads with 11-foot travel lanes and 8.5-foot parking lanes are included on both sides of the corridor. 20-foot pedestrian, bicycle, and amenity areas are included on the eastern and western edges of the corridor. This section has an assumed right-of-way of 175 feet.
  - Typical Section B, shown in Figure 54, was selected for this location because of the potential for high-density residential and commercial development on both sides of the roadway. Using the assumed 175-foot right-of-way, this alternative provides vehicular mobility while also providing space for parking, transit stops, landscaping, and bicycle & pedestrian amenities, thereby making for a transit oriented alternative and providing the amenities to suit high intensity mixed-use style development. To make Typical Section B feasible, eliminating building setbacks would be necessary and buildings should front the corridor. Due to the unique layout and associated cost of Typical Section B, additional evaluation and feasibility should occur before moving further into project develop.

Figure 54: Typical Section B (Facing North)



- » **Typical Section C (64<sup>th</sup> Avenue to 76<sup>th</sup> Avenue)** presents a three-lane roadway with one travel lane in each direction and a TWLTL. Both the travel lanes and the TWLTL lane have a width of 11 feet. An 8-foot parking lane is included on the east side of the roadway, as well as 10' foot shared use paths on each side of the corridor. The roadway alignment for Typical Section C is shifted 28-feet east of the section line to allow for a larger green space on the western edge of the corridor adjacent to Drain 27. This shift maintains a large boulevard on the east side of the roadway while providing increased separation between the meandering shared-use path and the roadway on the west side of the roadway. This section has an assumed right-of-way of 175 feet.
  - Typical Section C was selected for this location because the future land use for the parcels between Veterans Boulevard and Drain 27 have been identified as Greenway in the Horace Comprehensive & Transportation Plan. The parking has been included due to the potential for commercial development and based on Fargo's Future Land Use Plan. Typical Section C is shown in Figure 55.

Figure 55: Typical Section C (Facing North)



The Modified/Variable Alternative proposes roundabouts for the primary intersections at 64<sup>th</sup> Avenue South, 76<sup>th</sup> Avenue South, and 88<sup>th</sup> Avenue South. In addition, this alternative accounts for minor, stop-controlled intersections every 1/8<sup>th</sup> of a mile. Along Typical Section B, three full-access intersections are located on the main roadway, with eight right-in/right-out intersections proposed for the parallel frontage roads (four on each frontage road). Intersection location and type for the Modified/Variable Alternative are shown in Figure 56. Figure 57 provides additional detail on the location and design of minor intersections, by typical section, along the corridor extension.

Figure 56: Intersection Location and Type for the Modified/Variable Alternative

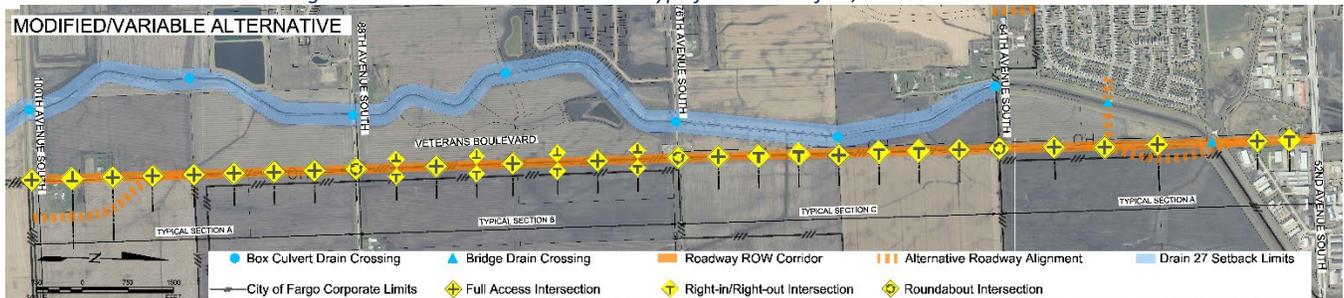
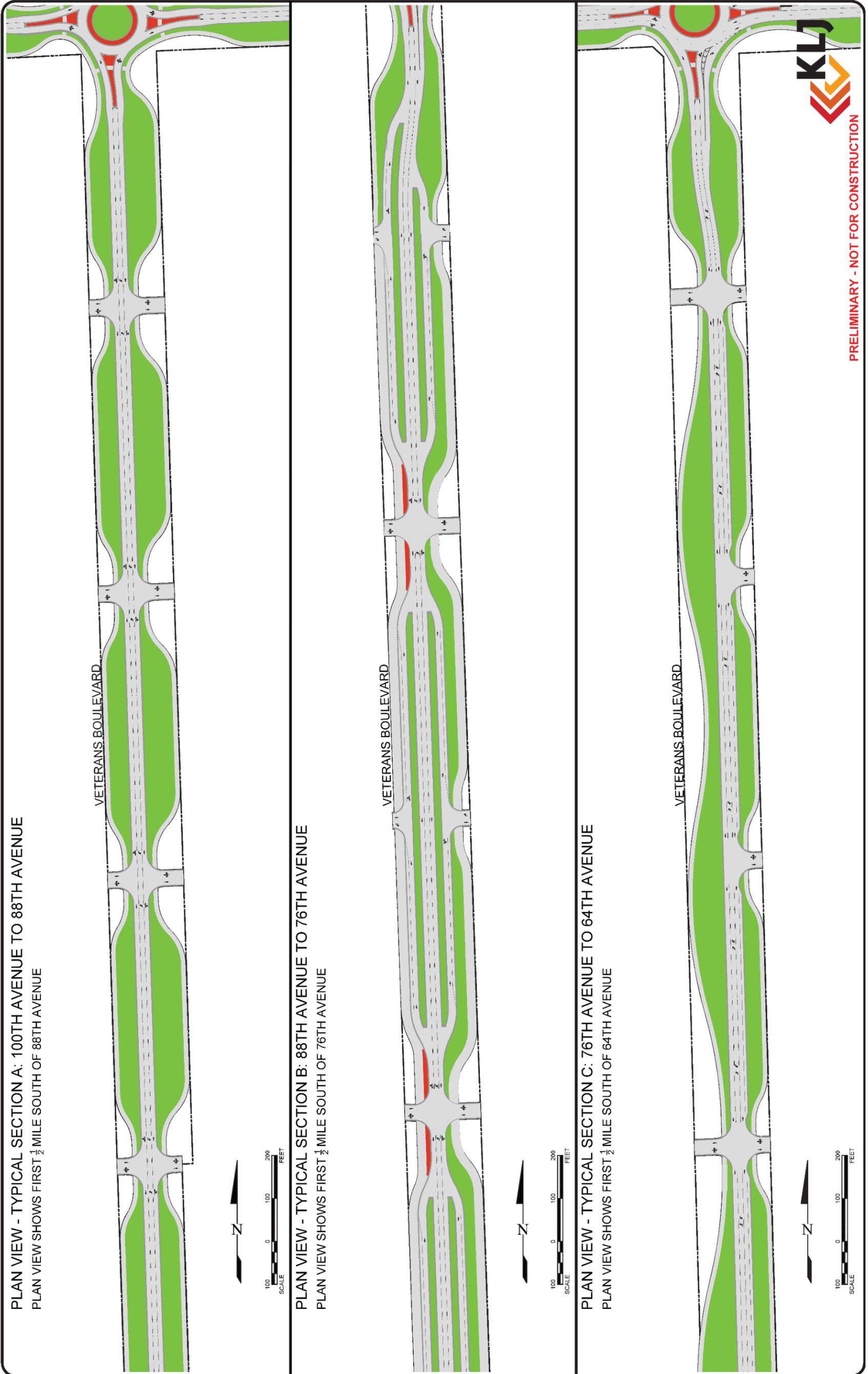


Figure 57: Location and Design of Minor Intersections by Typical Section



As previously noted, roundabouts evaluated along Veterans Boulevard at 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South were assumed to have single lane approaches along Veterans Boulevard and two-lane approaches along 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South. The roundabout at 88<sup>th</sup> Avenue South was assumed to have all single lane approaches. Hence, the 64<sup>th</sup> Avenue South and 76<sup>th</sup> Avenue South intersections are designed as 2x1 hybrid multilane roundabouts (2-lanes east-west; 1 lane north-south), and the 88<sup>th</sup> Avenue South intersection is designed as a single-lane roundabout. Planning-level design concepts for the primary intersections are shown in Figure 58, Figure 59, Figure 60.

Figure 58: Intersection of Veterans Boulevard and 64<sup>th</sup> Avenue South

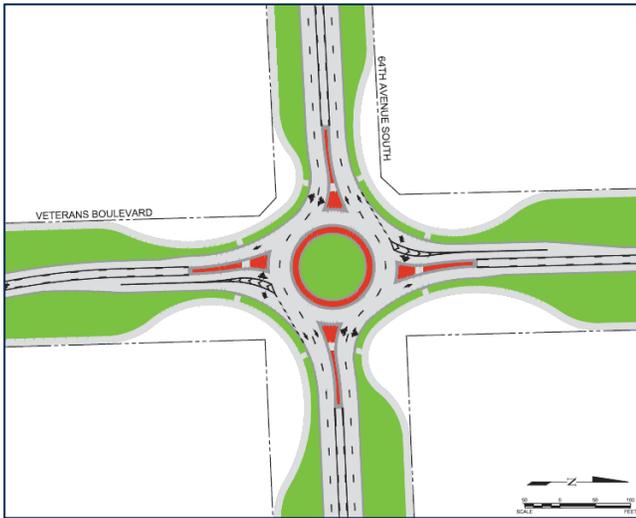


Figure 59: Intersection of Veterans Boulevard and 76<sup>th</sup> Avenue South

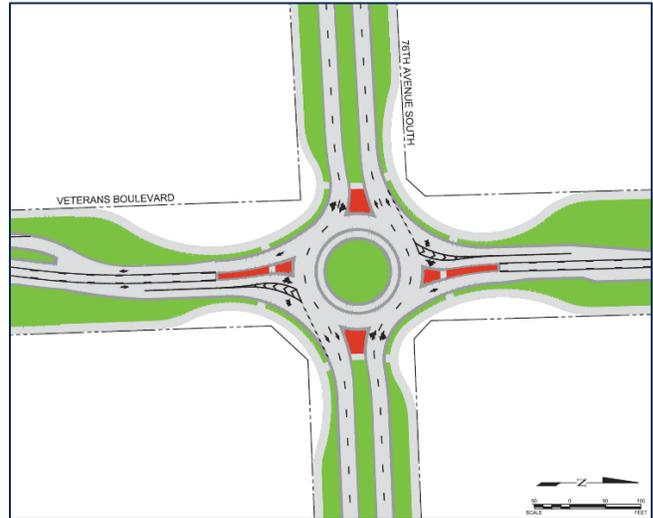


Figure 60: Intersection of Veterans Boulevard and 88<sup>th</sup> Avenue South

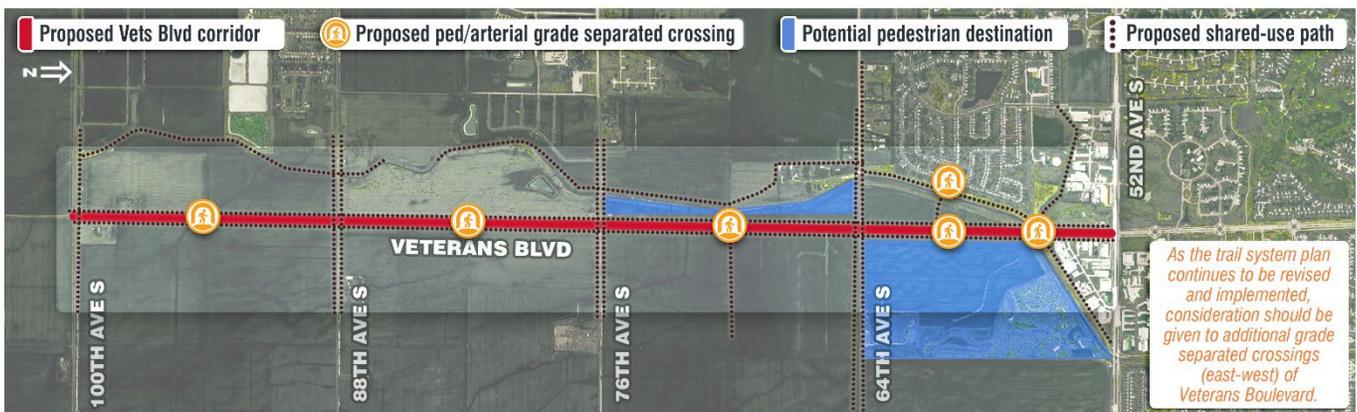


## INTEGRATING ACTIVE TRANSPORTATION

Active transportation infrastructure was considered in each of the corridor level options developed for the Veterans Boulevard Corridor Extension. The project team consulted with recent and ongoing planning with in both the City of Fargo and City of Horace when evaluating and developing recommendations for both bicycle and pedestrian facilities.

Beyond corridor level layouts, an area wide strategy plan was developed and shown below. This demonstrates the larger vision for ensuring bicycle and pedestrian mobility throughout the study area. The emphasis is on a regional network of trails and pathways and ensuring grade separated pedestrian crossings along arterials, especially for east-west travel patterns.

Figure 61, Future Bicycle and Pedestrian System Considerations



## DEER CREEK CONNECTION

Alternatives were developed for potential new connections to the Deer Creek neighborhood. The connections would provide additional access to the neighborhood, which would help improve emergency vehicle access and reduce travel along 63<sup>rd</sup> Street South. The alternatives include:

- » Extension of 59<sup>th</sup> Avenue South to Veteran's Boulevard
- » Connection between 63<sup>rd</sup> Avenue South and 64<sup>th</sup> Avenue South
- » Both a 59<sup>th</sup> Avenue South extension and connection between 63<sup>rd</sup> Avenue South and 64<sup>th</sup> Avenue South

The potential traffic impacts of these alternatives are analyzed in Chapter 3. The connection alternatives are shown in Figure 62. Additional detail is provided for each alternative in Figure 63.

While both the 59th Avenue and 63rd Street connections are feasible, there should be further evaluation prior to implementation. With the additional connections, comes impacts that have not been assessed such as:

- » Increase speeds
- » Increased headlight nuisances for homeowners
- » Vertical grades were not assessed as part of this study

Due to the large area surrounding this corridor and the multi-jurisdictional boundary, it is important that pedestrian safety remain a top consideration through implementation of this study. Large attractions such as the Drain 27 Trail network and the Fargo Master Storm Water ponds will generate large amounts of pedestrian traffic. To ensure connectivity and promote safety, it may be beneficial to incorporate grade separated pedestrian crossings along the Veteran's Boulevard Extension as well as some of the arterial roadways that intersect. The below graphic incorporates information obtained during the study along with previous studies that have been completed to identify pedestrian attractions, proposed pedestrian routes, and possible areas to incorporate grade separated crossings.

These grade separated crossings could be above or below the existing roadway. Things to consider during the design of these facilities include:

- » Storm water drainage
- » Overhead utilities
- » Roadway grades/sight distances

Figure 62: Location of Deer Creek Connection Alternatives

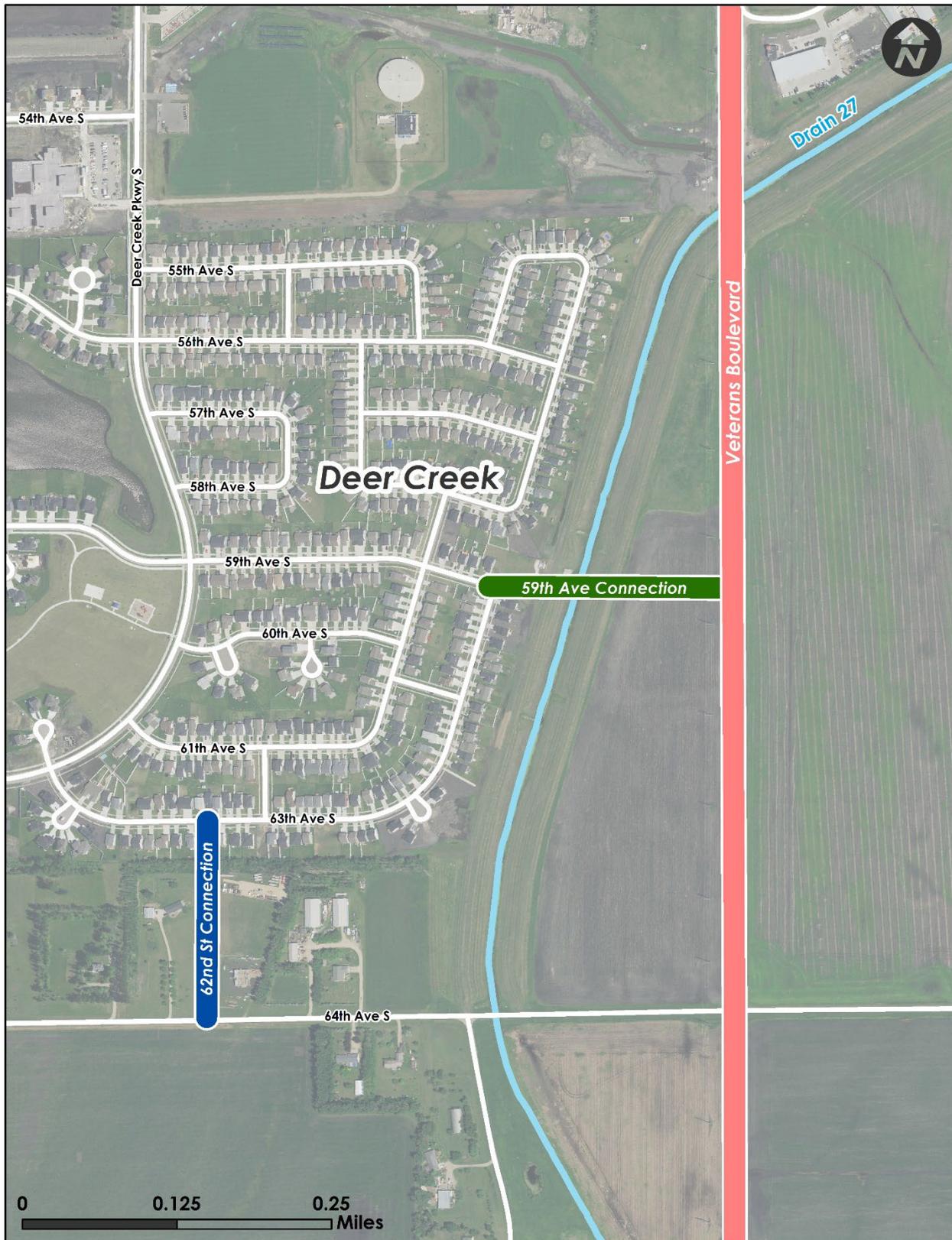


Figure 63: Deer Creek Connection Alternatives Detail



## COST ESTIMATE SUMMARY

Planning-level cost estimates were developed to aid in the evaluation of alternatives and support future project phasing and implementation. Cost estimates were prepared for the Veterans Boulevard extension alternatives, the Deer Creek connection alternatives, and the improvements to existing Veterans Boulevard intersections from 52<sup>nd</sup> Avenue to 40<sup>th</sup> Avenue. Cost estimates are summarized in Table 14.

Table 14: Planning-Level Cost Estimates

Veterans Boulevard - 100th Avenue to 52nd Avenue			
Roadway Segment/Intersection	Alternative		
	Standard	Roundabout	Modified/Variable
100th to 88th	\$ 8,660,000	\$8,590,000	\$8,450,000
88th Ave Intersection	\$1,816,000	\$ 1,410,000	\$ 1,500,000
88th to 76th	\$ 8,130,000	\$8,040,000	\$12,640,000
76th Ave Intersection	\$2,133,000	\$ 2,080,000	\$ 1,780,000
76th to 64th	\$ 8,080,000	\$7,740,000	\$8,250,000
64th Ave Intersection	\$2,041,000	\$ 1,990,000	\$ 2,100,000
64th to 52nd	\$11,920,000	\$11,590,000	\$11,440,000
<b>Total</b>	<b>\$42,780,000</b>	<b>\$41,440,000</b>	<b>\$46,160,000</b>

Veterans Boulevard - 52nd Avenue to 40th Avenue Intersection Revisions			
Intersection	Roundabout Revisions		Turn Lane Addition
	150' Diameter	180' Diameter	
51st Ave	\$566,000	\$899,000	NA
48th Ave	\$657,000	\$981,000	NA
44th Ave	\$521,000	\$1,064,000	NA
40th Ave	NA	NA	\$374,000

Deer Creek Connections	
59th Ave Extension	\$3,638,000
62nd Street Extension	\$598,000

## PUBLIC ART

In 2015, the City of Fargo established the Arts and Culture Commission to make recommendations to the City Commission regarding public art investments and encourage participation in public art by citizens, developers, and property owners. The Fargo Public Art Master Plan developed a framework for a sustainable public art program and a vision of Fargo as a cultural hub and destination.

The theme of public art was highlighted during public engagement, with focus group members discussing public art as an important aspect of the future Veterans Boulevard corridor. Specifically, participants believe that public art will be a key factor in creating a corridor that is enjoyable to use, and that serves not only as a route through the southwest metro, but as a destination. Focus group members were particularly interested in artwork that reflects the community's identity.



Location: Port of Kennewick, WA

This emphasis on public art is reflected in the Corridor Vision, which points to displays of public art as a key ingredient in creating a “sense of place” along the corridor. Public art that reflects the community, integrated with landscaping, green spaces, and recreational amenities, will attract people to the corridor and enhance the livability of the surrounding community.

While specific public artwork recommendations for the corridor have yet to be developed, a range of possibilities exist:

- » Use of wetland and prairie plants to make Drain 27 a distinct, attractive feature
- » Creative and dynamic landscaping which incorporates sculpture
- » Artwork created by local artists, including children
- » Street murals reflecting the community’s cultural values
- » Creative/strategic use of lighting to illuminate artwork; incorporation of lighting within artwork
- » Artistic pedestrian amenities such as benches, bike racks, drinking fountains, planters, and transit shelters
- » Community gardening areas



*Location: Canberra, Australia*



*Location: Port of Kennewick, WA*

## **APPENDIX A. IMPLEMENTATION MEMORANDUM**

# VETERANS BOULEVARD CORRIDOR

EXTENSION STUDY

Implementation Analysis

## TABLE OF CONTENTS

Table of Contents.....	i
List of Figures .....	i
Background .....	2
Travel Modeling .....	2
Implementation analysis.....	5
Veterans Boulevard.....	5
Sheyenne Street/County Road 17 – 40 <sup>th</sup> Avenue to 88 <sup>th</sup> Avenue.....	6
64 <sup>th</sup> Avenue .....	8
76 <sup>th</sup> Avenue .....	10
45 <sup>th</sup> Street .....	10
88 <sup>th</sup> Avenue .....	10
Implementation & Phasing .....	11

## LIST OF FIGURES

Figure I-1: Year 2035 Implementation Scenarios – Traffic Forecasts .....	4
Figure I-2: Veterans Blvd, 64th Ave to 88th Ave.....	6
Figure I-3: County Road 17 – 52nd Ave to 76th Ave.....	7
Figure I-4: 64th Avenue, CR 17 to 45th St.....	9
Figure I-5: 64th Avenue, CR 17 to 45th St.....	9
Figure I-6: Implementation & Phasing Strategy.....	12

## BACKGROUND

Following the completion of the initial phase of the Veterans Boulevard Corridor Extension Study, Metro COG approved additional analysis to support more detailed implementation planning and phasing for the Veterans Boulevard Corridor Extension study area. This additional phase of analysis was focused on understanding a detailed implementation plan for improvements along both a future extension of Veterans Boulevard and adjacent study corridors through the year 2035. This memorandum is a summary of the analysis and resulting recommendations.

## TRAVEL MODELING

### Initial Year 2035 Travel Models

Models run earlier in the planning process included two (2) base year 2035 scenarios (See *Figure 1 - Year 2035 – Scenario 1 and Year 2035 – Scenario 2*). These initial Year 2035 Scenarios were focused on evaluating interchange configurations at either 64<sup>th</sup> and 76<sup>th</sup> Avenue and impacts of extending Veterans Boulevard, as listed below.

- » 2035 Scenario 1
  - Extension of Veterans Boulevard to 76<sup>th</sup> Avenue S
  - Extension of 45<sup>th</sup> Street S to 76<sup>th</sup> Avenue S
  - Extension of 38<sup>th</sup> Street S to 64<sup>th</sup> Avenue S
  - Overpass at 64<sup>th</sup> Avenue S
  - Interchange at 76<sup>th</sup> Avenue S
- » 2035 Scenario 2
  - Same as Scenario 1, but “No” interchange at 76<sup>th</sup> Avenue S
  - Interchange at 64<sup>th</sup> Avenue S

### 2035 Implementation Models

Three new model runs were developed based on the 2035 travel demand model (TDM) for the Fargo-Moorhead Metropolitan Council of Governments (Metro COG) to support this Implementation Analysis Memorandum. Three travel demand model scenarios were run under year 2035 conditions to correspond to a mid-range implementation timeframe (See *Figure 1 - 2035 Implementation Scenario 1, 2, and 3*).

The project team worked closely with representatives from the SRC to identify key assumptions for the three new implementation scenarios. These scenarios maintained the previously approved socio-economic data for year 2035 conditions, however focused on varying transportation network changes, and are listed below.

- » 2035 Implementation Scenario 1
  - No Veterans Boulevard: 52<sup>nd</sup> Avenue S to 64<sup>th</sup> Avenue S
  - No 64<sup>th</sup> Avenue: 45<sup>th</sup> Street to Veterans Boulevard
  - Assumes Veterans Boulevard from 76<sup>th</sup> Avenue S to 88<sup>th</sup> Avenue S
  - Assumes 88<sup>th</sup> Avenue S from CR 17 to Veterans Boulevard
  - Overpass at 64<sup>th</sup> Avenue S
  - No Interchange at either 64<sup>th</sup> Avenue S or 76<sup>th</sup> Avenue S
- » 2035 Implementation Scenario 2
  - Builds upon 2035 Implementation Scenario 1
  - Assumes Veterans Boulevard from 52<sup>nd</sup> Avenue S to 64<sup>th</sup> Avenue S
  - Assumes 64<sup>th</sup> Avenue from 45<sup>th</sup> Street to Veterans Boulevard

- » 2035 Implementation Scenario 3
  - Builds upon 2035 Implementation Scenario 2
  - Assumes an interchange at 64<sup>th</sup> Avenue S

The goal of these 2035 Implementation Plan model scenarios was to better understand how various programmed or committed roadway segments influence traffic volumes along several study area corridors. The focus was on understanding a series of best fit investments through the year 2035 to compliment a series of shorter term programmed or committed projects planned in the study area.

The Implementation Plan focuses specifically on Sheyenne Street, CR 17, 76<sup>th</sup> Avenue, 45<sup>th</sup> Street, and 64<sup>th</sup> Avenue. Emphasis was put on determining the level of investment needed both for the extension of Veterans Boulevard south of 52<sup>nd</sup> Avenue, and for the two additional miles of Veterans Boulevard south of 64<sup>th</sup> Avenue to support study area development trends and projected travel patterns.

A summary of the year 2035 implementation scenario traffic forecasts is provided in Figure I-1, which also illustrates the assumed transportation network for each scenario. The findings of these model runs were used to develop an overall set of implementation recommendations for the Veterans Boulevard Study Area through the year 2035.

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## IMPLEMENTATION ANALYSIS

Using 2035 build condition model results, an implementation analysis was completed for a series of corridors within relative proximity to the Veterans Boulevard Corridor. The analysis develops an infrastructure phasing plan both for Veterans Boulevard as well as several interrelated corridors within the general study area.

A set of corridor level planning recommendations are developed for the following corridors:

- » Veterans Boulevard – 52<sup>nd</sup> Avenue to 88<sup>th</sup> Avenue
- » Sheyenne Street/County Road 17 – 40<sup>th</sup> Avenue to 88<sup>th</sup> Avenue
- » 45<sup>th</sup> Street – 52<sup>nd</sup> Avenue to 76<sup>th</sup> Avenue
- » 64<sup>th</sup> Avenue – I-29 to Country Road 17
- » 76<sup>th</sup> Avenue – I-29 to Veterans Boulevard
- » 88<sup>th</sup> Avenue – Veterans Boulevard to County Road 17

## VETERANS BOULEVARD

A full build travel model was originally used to develop the proposed corridor and intersection level typical sections developed earlier in the study process for the Veterans Boulevard corridor. From a corridor preservation standpoint those initial recommendations for a three-lane facility remain. However, based on 2035 Implementation Models, a set of lower cost interim improvements are likely a more cost-effective strategy to meet projected needs along the Veterans Boulevard Corridor through the year 2035 prior to constructing a full three-lane urban section. These interim investments are most relevant for the two miles of Veterans Boulevard south of 64<sup>th</sup> Avenue.

The Implementation Plan provides a set of considerations for Veteran Boulevard from 52<sup>nd</sup> Avenue through 88<sup>th</sup> Avenue as follows to address needs projected through the year 2035, as follows.

### 52<sup>nd</sup> Avenue to 64<sup>th</sup> Avenue

- » Once the 64<sup>th</sup> Avenue interchange (Programmed 2025) is constructed, the benefits of the Veterans Boulevard extension between 52<sup>nd</sup> and 64<sup>th</sup> Avenue become less significant across the study area, specifically to 45<sup>th</sup> Street and Sheyenne Street
- » Based on the 2035 travel model, implementation of this section of corridor is not needed prior to 2030
- » Provided the City of Fargo and NDDOT proceed with an interchange at 64<sup>th</sup> Avenue, this section of Veterans Boulevard would only carry 5,000 vehicles by 2035, the original estimate for this mile of corridor was \$12M
- » Prior to 2030, resources projected for the Veterans Boulevard extension could be used on other study area corridors, specifically:
  - Completing 64<sup>th</sup> Avenue Interchange
  - Completing the 64<sup>th</sup> Avenue corridor from 38<sup>th</sup> Street to CR 17
  - Improving the 45<sup>th</sup> Street corridor from 52<sup>nd</sup> Avenue to 64<sup>th</sup> Avenue (beyond the improvement programmed for 2022)
  - Improving Veterans Boulevard from 64<sup>th</sup> Avenue to 88<sup>th</sup> Avenue

### 64<sup>th</sup> Avenue to 76<sup>th</sup> Avenue

- » City of Fargo and City of Horace work cooperatively on developing an interim roadway section, including development of a corridor Memorandum of Understanding (MOU).
- » Consider developing an interim two-lane rural roadway section from 76<sup>th</sup> Ave to 88<sup>th</sup> Ave before 2030

- » Construction should occur prior to initiating development of the Sheyenne Street/CR 17 reconstruction south of 52<sup>nd</sup> Avenue
- » Interim two-lane roadway estimated at \$2.7M per.

## 76<sup>th</sup> Avenue to 88<sup>th</sup> Avenue

- » City of Fargo and City of Horace work cooperatively on developing an interim roadway section along this section, including development of a corridor MOU.
- » Consider developing an interim two-lane rural roadway section from 76<sup>th</sup> Ave to 88<sup>th</sup> Ave before 2030. This implementation should be coupled with improvements to 88<sup>th</sup> Ave west of Veterans Boulevard, this provides for an alternative route to portions of CR 17 south of 76<sup>th</sup> Ave
- » Construction should occur prior to initiating development of the Sheyenne Street/CR 17 reconstruction south of 52<sup>nd</sup> Avenue
- » Interim two-lane roadway estimated at \$2.7M per mile, as shown in Figure I-2.

Figure I-2: Veterans Blvd, 64th Ave to 88th Ave



## SHEYENNE STREET/COUNTY ROAD 17 – 40<sup>TH</sup> AVENUE TO 88<sup>TH</sup> AVENUE

The 2035 Implementation models show the need for a four-lane facility along Sheyenne Street/County Road 17 from 40<sup>th</sup> Avenue through 76<sup>th</sup> Avenue. Implementation of the recommended section will need to be integrated with a series of short term programmed projects being developed by Cass County. Considerations for Sheyenne Street/CR 17 should be considered in four segments as follows.

### 40<sup>th</sup> to 52<sup>nd</sup> Avenue

Modeling completed as part of the Veterans Boulevard Corridor Extension Study finds that this stretch of Sheyenne Street will push the limit of three-lane facility. Given the potential for a future Federal aid project along Sheyenne Street from 40<sup>th</sup> to 52<sup>nd</sup> Avenue, a detailed traffic analysis will determine the final capacity needs for this corridor. The findings of this study should be used to start a more detailed traffic analysis as part of the Sheyenne Street Project Development process from 40<sup>th</sup> to 52<sup>nd</sup> Avenue South.

### 52<sup>nd</sup> to 64<sup>th</sup> Avenue

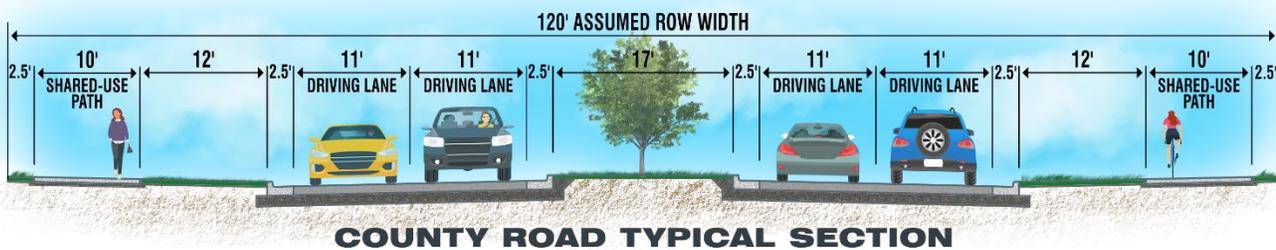
- » Plan for a four-lane urban section for implementation before 2030, likely the next urban aid priority following segment from 40<sup>th</sup> to 52<sup>nd</sup> Avenue, potentially in 2028
- » Coordinate with pending box culvert over Sheyenne River (Cass County 2023)
- » Coordinate with pending roundabout at 64<sup>th</sup> Avenue (Cass County 2023)

### 64<sup>th</sup> to 76<sup>th</sup> Avenue

- » Plan for four lane urban section for implementation after 2030

- » Proposed overlay (Cass County 2024) extends life of existing pavement at least to 2035; however, need for widening needed before 2035
  - Consider potential small-scale capacity, operational and safety improvements along this stretch of CR 17 to extend the life of the current three lane facility through at least 2030
- » Coordinate for transition to three lane section at 76<sup>th</sup> Avenue roundabout

Figure I-3: County Road 17 – 52nd Ave to 76th Ave



## 76<sup>th</sup> to 88<sup>th</sup> Avenue

- » Existing rural three-lane section adequate through 2035.
- » Coordinate with Cass County prior to programmed overlay (Cass County 2024) to identify specific safety or operational needs.

## Memorandum of Understanding (MOU) – Cass County & City of Horace

Cass County and City of Horace signed an MOU in March of 2021. The MOU has a term of 20 years with successive periods of 20 years until the turnover of the corridor is completed. The MOU is intended to address certain corridor issues and to provide clarity on jurisdictional, operations and transportation improvement needs within growth areas adjacent to Horace, West Fargo, and Fargo. Key elements of that MOU to the general study area of this memorandum are as follows:

- » Consistent with state statute, the MOU sets forth a 2-year timeframe for turnover upon Horace reaching a population of 5,000. The 2020 census shows Horace with a population of 3,085.
  - Considerations:
    - The MOU does not specify what instrument will be used to establish the official population of Horace on a year-to-year basis
    - Contingency may be needed in the event widening/reconstruction is needed before Horace achieves urban aid status
- » Specific to programmed roadway improvement projects within city limits – amenities outside the standard road improvements (shared use paths, city utilities, etc.) will be the financial responsibility of the City of Horace
- » The agreement provides the City of Horace with a greater level of responsibility and involvement in decision-making prior to the turnover
  - Considerations:
    - Horace and Cass County should think through proposed overlay (2024) to ensure it accounts for needed capacity, operational and safety needs through the year 2035

- » Cass County will retain maintenance, utility permitting and snow removal responsibilities until the turnover is completed
- » Cass County will retain access control responsibilities until the 2-year timeframe for turnover is initiated. The agreement states that the City's land development code would then be used for spacing and other access control standards. The interim period is not specifically addressed in the agreement – thus, it is unclear if the County access standards are to be used until the turnover timeframe is initiated
- » Traffic signals and intersection control will be the responsibility of the City of Horace with input from Cass County

## 64<sup>TH</sup> AVENUE

Based on the 2035 Implementation models, 64<sup>th</sup> Avenue becomes a significant link in the overall subarea, specifically once the interchange at I-29 is completed. Development of the programmed 64<sup>th</sup> Avenue Interchange (2025) coupled with the completion of the 64<sup>th</sup> Avenue corridor from CR 17 to 45<sup>th</sup> Street serves to improve traffic distribution in the study area. This includes reduction in demand on north-south corridors, specifically Sheyenne Street/CR 17 and 45<sup>th</sup> Street.

An implementation strategy for 64<sup>th</sup> Avenue includes the following observations and recommendations.

### Interchange

- » Proceed with project development (interstate justification report) on 64<sup>th</sup> Avenue interchange using initial 2035 modeling corridor build out assumptions from this study

### CR 17 to 38<sup>th</sup> Street

- » Proceed with development of a three-lane section (see Figure I-4) to meet projected demand along the corridor through year 2035.
  - Phase 1 – Construct corridor from 45<sup>th</sup> Street to 38<sup>th</sup> Street (City of Fargo 2023)
  - Phase 2 – Construct two miles from 45<sup>th</sup> Street to Sheyenne Street (before 2030)
- » Modeling shows that full build out of 64<sup>th</sup> Avenue from CR 17 to 38<sup>th</sup> Street requires a four-lane section beyond 2035 (see Figure I-5).

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Figure I-4: 64th Avenue, CR 17 to 45th St

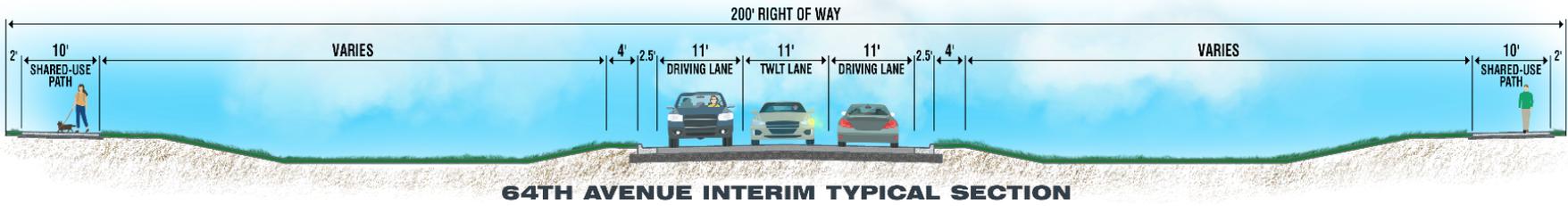


Figure I-5: 64th Avenue, CR 17 to 45th St



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## 76<sup>TH</sup> AVENUE

The highest priority investments along 76<sup>th</sup> Avenue will be completed with the imminent project (2022) on 76<sup>th</sup> Avenue from CR 17 to 45<sup>th</sup> Street and the related connection along 45<sup>th</sup> Street from 76<sup>th</sup> Avenue to 52nd Avenue. However, additional considerations and observations resulted from the 2035 Implementation models.

### Veterans Boulevard to 45<sup>th</sup> Street

- » Consider interim intersection control at 45<sup>th</sup> Street after 2030.
- » Reconstruct to an urban section after 2035. Refer to 76th Avenue South Corridor Study (completed 2020) for recommended roadway sections.

### 45<sup>th</sup> Street to I-29 & Grade Separation/Interchange

- » Improvements will not be needed before 2035 assuming City of Fargo and NDDOT proceed with the 64<sup>th</sup> Avenue Interchange and related connectivity between CR17 and 38<sup>th</sup> Street along 64<sup>th</sup> Avenue.

## 45<sup>TH</sup> STREET

The City of Fargo will construct a three-lane section from 52<sup>nd</sup> Avenue to 58<sup>th</sup> Avenue and then a two-lane section from 58<sup>th</sup> south to 64<sup>th</sup> Avenue. These projects will be completed in 2022.

These initial improvements will assist with improving connectivity within the study area, specifically relating to the programmed overpass (2022) and interchange (2025) at 64<sup>th</sup> Avenue. Additional recommendations for this corridor are as follows.

### 52nd Avenue to 64<sup>th</sup> Avenue

- » Expand the section from 52<sup>nd</sup> to 58<sup>th</sup> to four lanes before 2030
- » Expand section from 58<sup>th</sup> to 64<sup>th</sup> Avenue to a 4-lane urban section before 2030

### 64<sup>th</sup> Avenue to 76<sup>th</sup> Avenue

- » Reconstruct to three lane urban standards after 2035 (reevaluate this recommendation again closer to 2030)
- » Timing and phasing however may vary based on timing of 76<sup>th</sup> Avenue extension to I-29 and potential grade separation/interchange

## 88<sup>TH</sup> AVENUE

A connection along 88<sup>th</sup> Avenue from CR 17 to the future extension of Veterans Boulevard is needed is to assist with providing an alternative set of corridors to CR 17 south of 76<sup>th</sup> Avenue. Development of a paved roadway section is needed from for eastern half mile of this corridor.

- » Construct the last half mile of this corridor to Veterans Boulevard as two-lane rural section before 2030
- » Coupled with improvements to Veterans Boulevard from 88<sup>th</sup> to 76<sup>th</sup> Avenue, this provides for an alternative route to portions of CR 17 south of 76<sup>th</sup> Avenue.

## IMPLEMENTATION & PHASING

Figure I-6 shows a relative implementation and phasing program for corridor level improvements within the study area. As an area wide study, implementation and phasing is broken into the following bands. The banding is broad in nature to account for potential variation in the actual programming of various projects within the study area.

- » Existing/Committed – Completed or imminent 2022 to 2025
- » Investment < 2030 – Projects needed/recommended prior to 2030
- » Investment >2030 – Projects needed/recommended after 2030
- » Investment >2035 – Projects needed/recommended after 2035

To ensure a coordinated and cohesive corridor development throughout the study area, the jurisdictions of Cass County, Fargo, and Horace should conduct meetings in an effort to align their future land use plans as an activity for roadway design and timing. The quarterly Southwest Metro Coordination meetings hosted by Metro COG could be a good venue for these discussions.

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Figure I-6: Implementation & Phasing Strategy

