

VETERANS BOULEVARD CORRIDOR

EXTENSION STUDY

Existing Conditions Report

August 2020

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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 45th Street and longer-term improvements along both 64th Avenue and 76th Avenue. 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 40th Avenue and 52nd Avenue South, and the potential for an extension from 52nd Avenue to 100th Avenue South. The study will also evaluate five existing intersections along the corridor:

- » Veterans Boulevard and 40th Avenue South
- » Veterans Boulevard and 44th Avenue South
- » Veterans Boulevard and 48th Avenue South
- » Veterans Boulevard and 51st Avenue South
- » Veterans Boulevard and 52nd 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 52nd Avenue to 64th Avenue was estimated around \$7.5 million with a proposed three-lane roadway. Beyond explicit mentions of Veterans

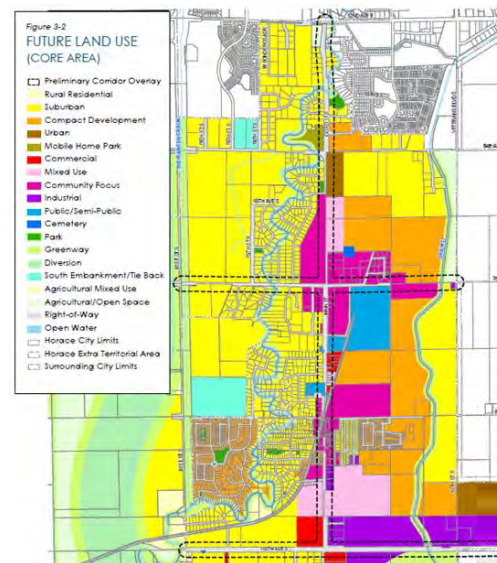
Boulevard, this document provides regional transportation goals and performance measurement requirements that will inform the Veterans Boulevard planning process.

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

Figure 1: Future Land Use Plan from Horace 2045



The plan recommends classifying the future Veterans Boulevard between 64th Avenue and 100th 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 40th Avenue and 52nd Avenue as a future Active Living Street, which includes infrastructure to support pedestrians, cyclists of all abilities, transit, and automobiles. Along 40th Avenue, the map shows an All-Season City-Wide Trail Loop crossing over Veterans Boulevard and running along Drain 27.

Figure 2: All Season Trail Alignment

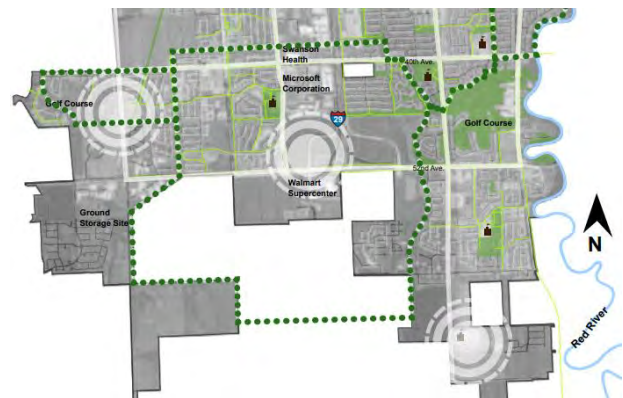


Figure 3: Study Area



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 52nd Avenue. The Veterans Boulevard extension to 100th 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 52nd Avenue and 76th Avenue and a two-lane arterial between 76th Avenue and 100th 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 52nd Avenue South between Drain 27 and 45th Street South and would not allow for connectivity with Veterans Boulevard north of 52nd 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 40th Avenue and 52nd 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.

76th 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 76th Avenue South between 81st 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 76th 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.

Fargo Stormwater Master Plan

The Fargo Stormwater Master Plan is evaluating the growth potential in the southwest metro to determine the size and location of a stormwater pond. The proposed pond design is shown in Figure 4. It stretches from Drain 27 to 64th Avenue and from the 57th Street/Veterans Boulevard mile-line alignment to approximately the quarter-section. This alignment would limit the potential Drain 27 crossing alignments possible for Veterans Boulevard and potential east-west corridors. This could potentially increase traffic demand on parallel corridors and intersections, including Veterans Boulevard and 64th Avenue.

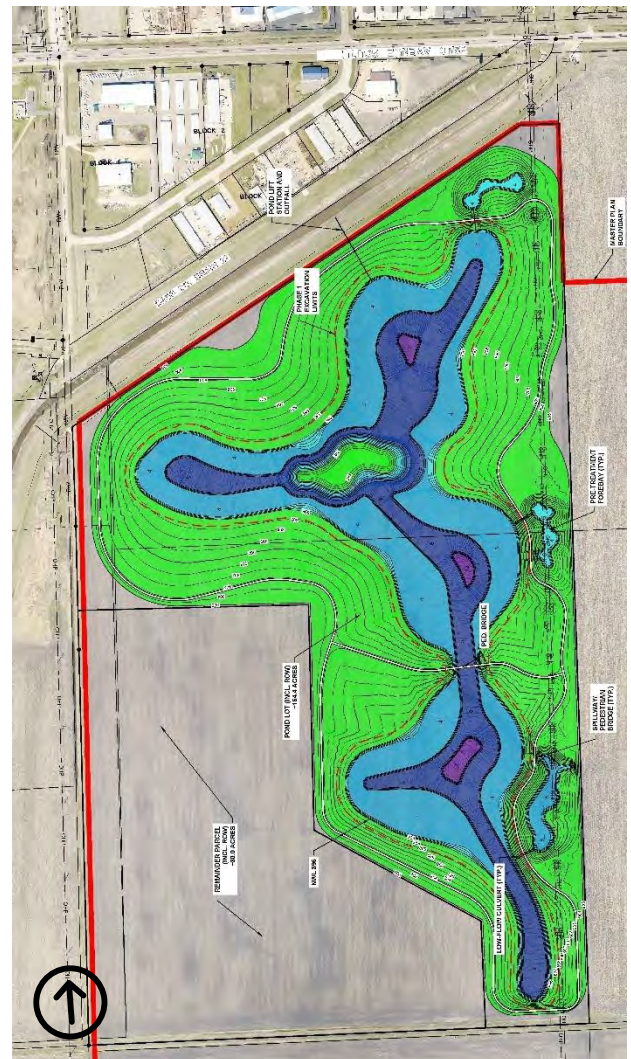
Fargo Safe Routes to School Plan

The Fargo Safe Routes to School Plan evaluated the transportation network surrounding every elementary and middle school within the City of Fargo boundaries. Four schools are located on or around the study area, including Liberty Middle, Independence Elementary, Osgood Elementary, and Deer Creek Elementary. The major challenges identified in the study area include:

- » Low yield behavior at the Veterans Boulevard and 44th Avenue S roundabout. Opportunities for improvement include installing forward stop bars and rectangular rapid flashing beacons on crossings.
- » The trail crossing on Veterans Boulevard is unmarked, has long crossing distances, and high-speed and high-volume traffic. Opportunities for improvement include installing a curb extension, RRFB, high visibility crosswalks, forward stop bars, and refuge island.

The Veterans Boulevard corridor study can begin to incorporate these improvements into the improvement plans, as well as utilize the best practices identified in the Safe Routes to School Plan for bicycle and pedestrian amenities along the corridor.

Figure 4: Fargo Stormwater Alignment



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 40th Avenue and 52nd 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

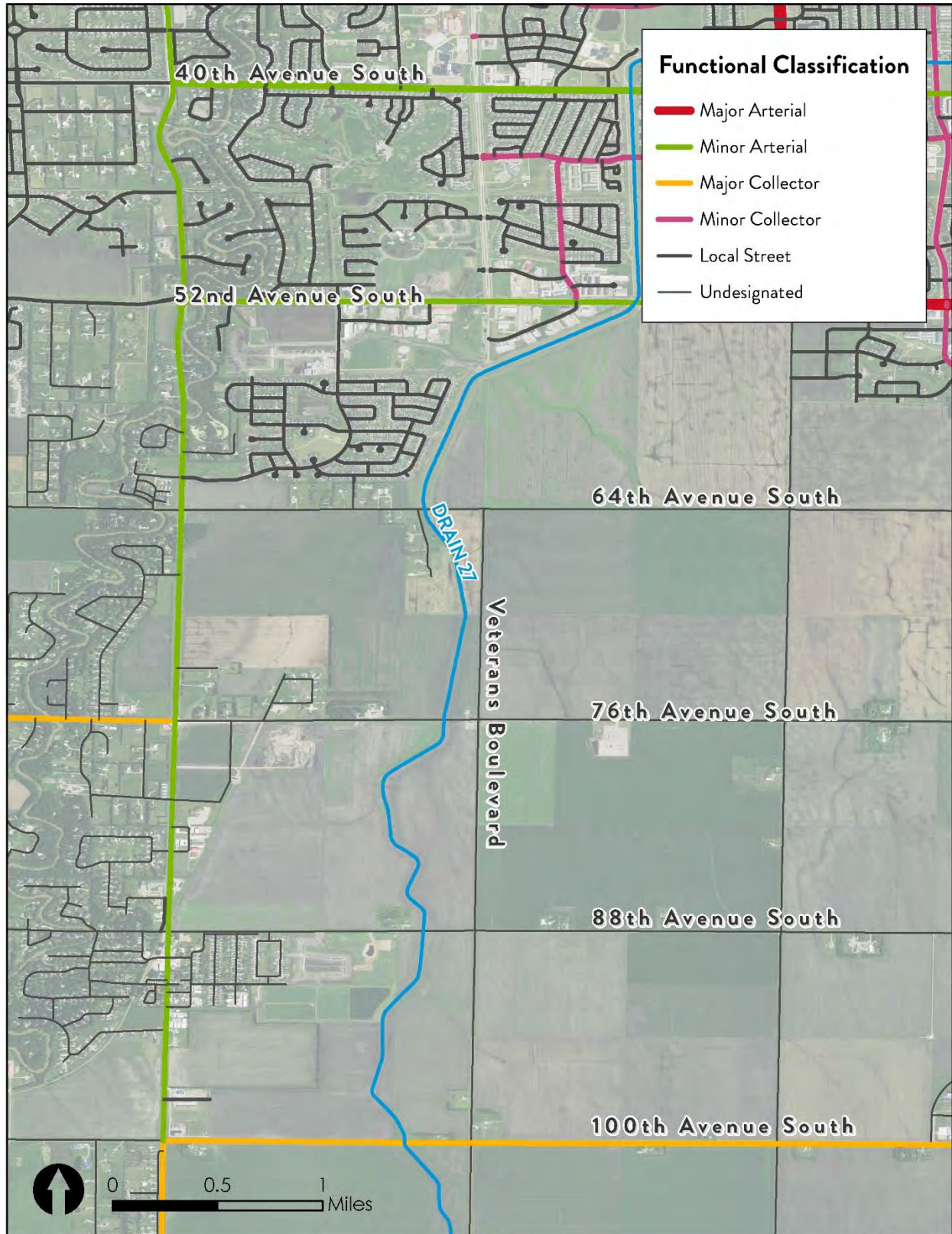
The Veterans Boulevard Corridor study area has two distinct cross-sections.

- » Veterans Boulevard between 40th Avenue and 52nd 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 44th Avenue South, 47th Avenue South, and 51st Avenue South.
- » Veterans Boulevard between 52nd Avenue South and 100th Avenue South is an unpaved rural road with no markings and no pedestrian/bicycle infrastructure.

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



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 th Avenue South to 52 nd Avenue South	151
52 nd Avenue South to Drain 27	133
Drain 27 to 64 th Avenue South	66*
64 th Avenue South to 94 th Avenue South	66*
94 th Avenue South to 100 th 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, along and across the Veterans Boulevard corridor between 40th 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 40th Avenue to 52nd 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 40th Avenue and 52nd Avenue. South of 52nd 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 40th Avenue and 100th 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

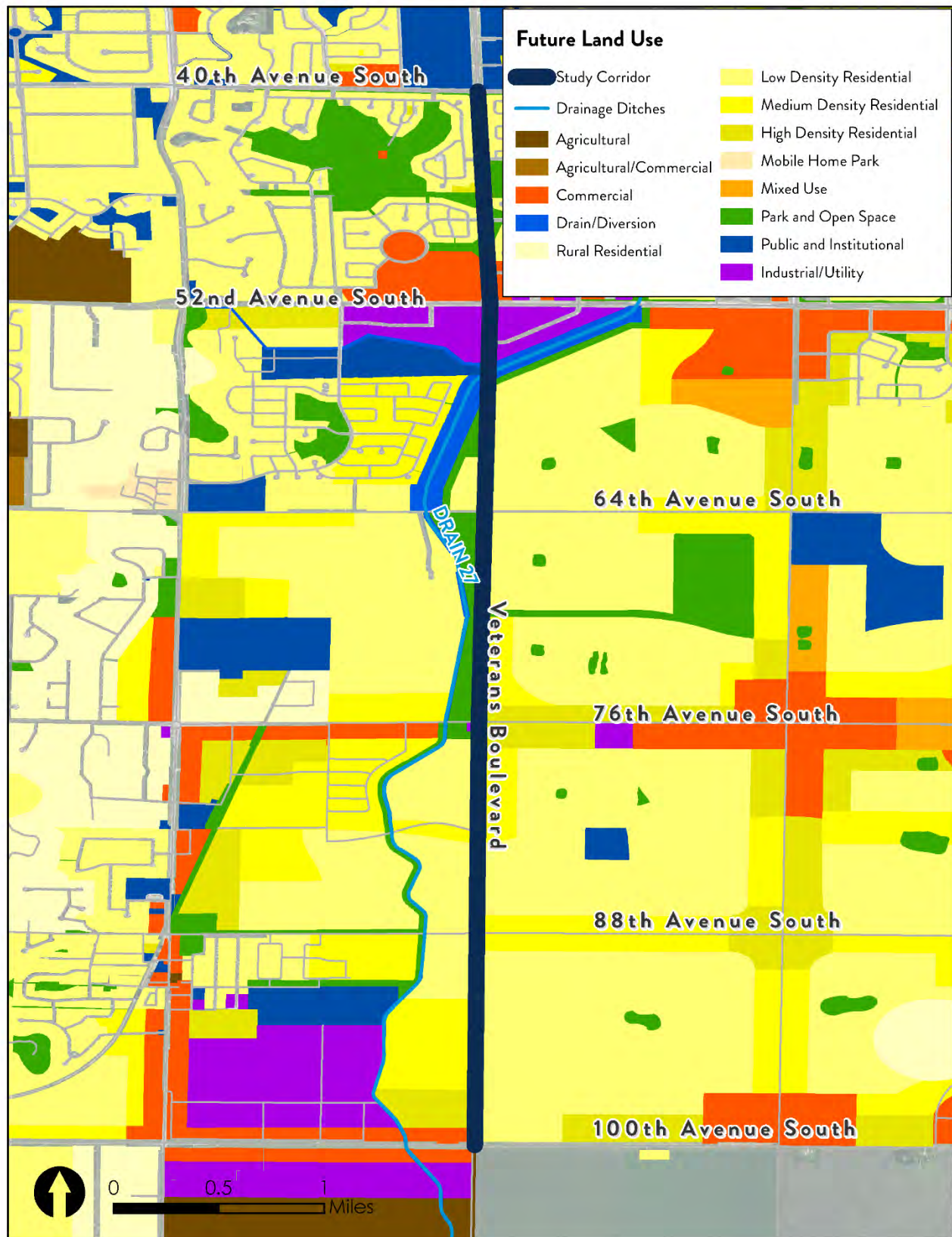
Land use can have many implications on the characteristics of a neighborhood and the efficiency of its transportation network. For example, a primarily industrial neighborhood will have peak traffic flows often associated with shift work and must accommodate heavy truck movements whereas a residential 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 52nd Avenue with a neighborhood center (walkable housing mixture with services, schools, and parks) between 40th Avenue and 52nd 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.

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.

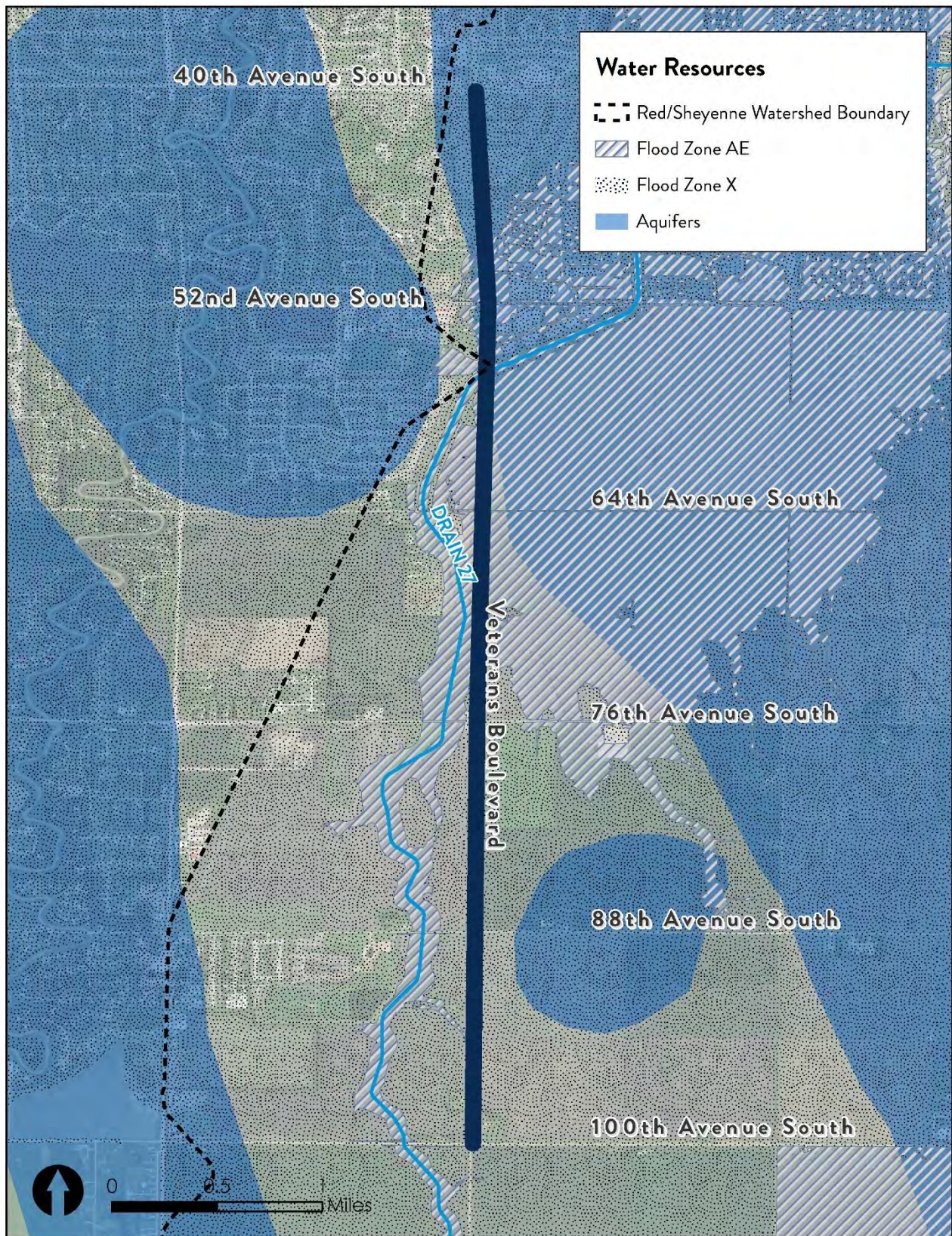
ENVIRONMENTAL JUSTICE

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 48th Avenue and 76th Avenue occurs within such a special flood hazard area (Zone AE) or other flood area (Zone X – shaded¹). 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-

¹ 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.

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.

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

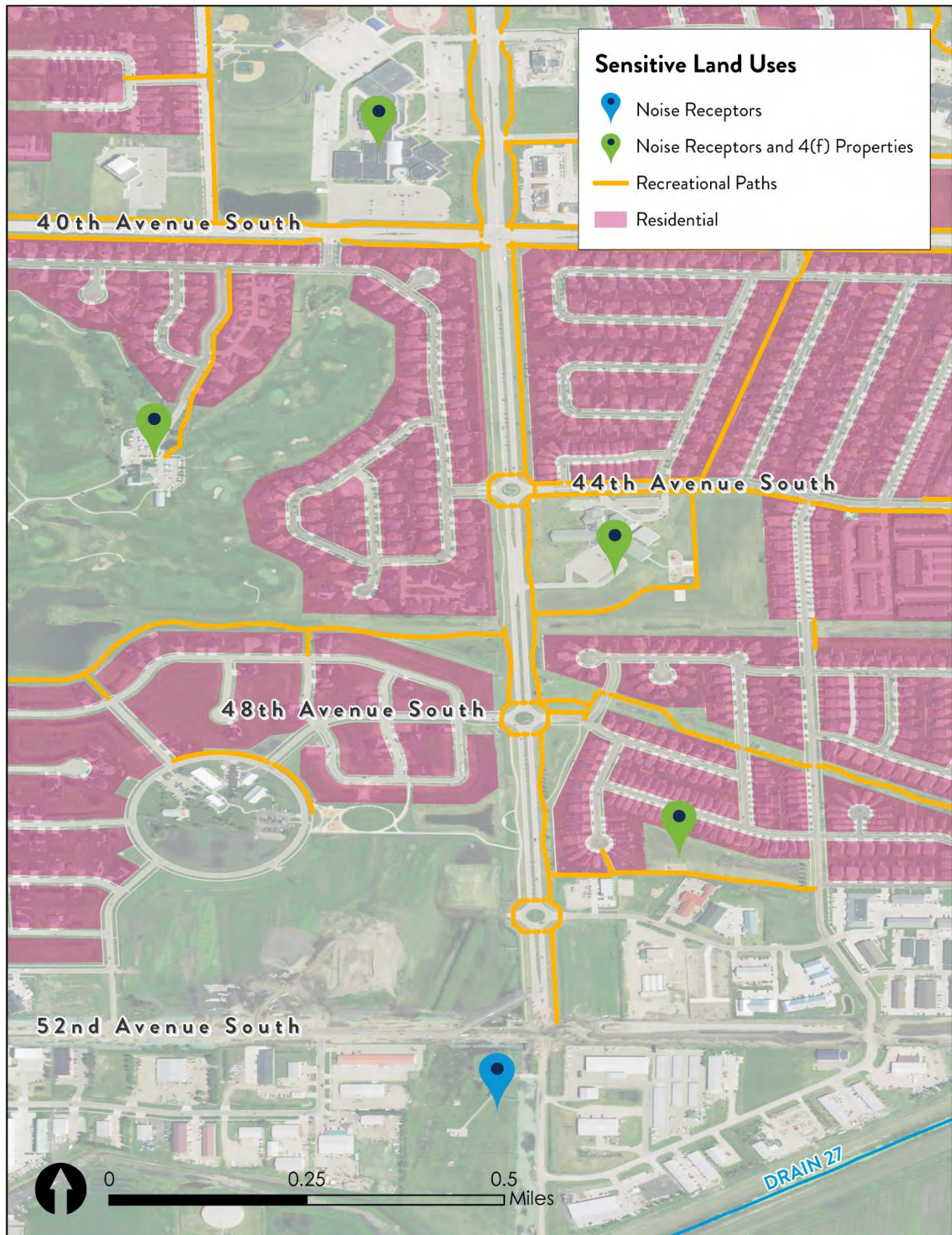
Section 4(f) of the Department of Transportation Act (23 U.S.C. 138) prohibits federal transportation agencies from approving the use of significant public parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless no feasible and practicable avoidance alternative 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.

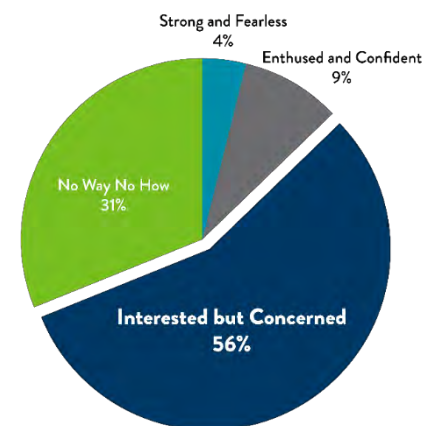
TYPES OF CYCLISTS

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 40th Avenue to 52nd Avenue. There are no facilities south of 52nd Avenue.

There are marked crosswalks at 40th Avenue, 44th Avenue, 48th Avenue, and 52nd 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 44th Avenue and 48th 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.

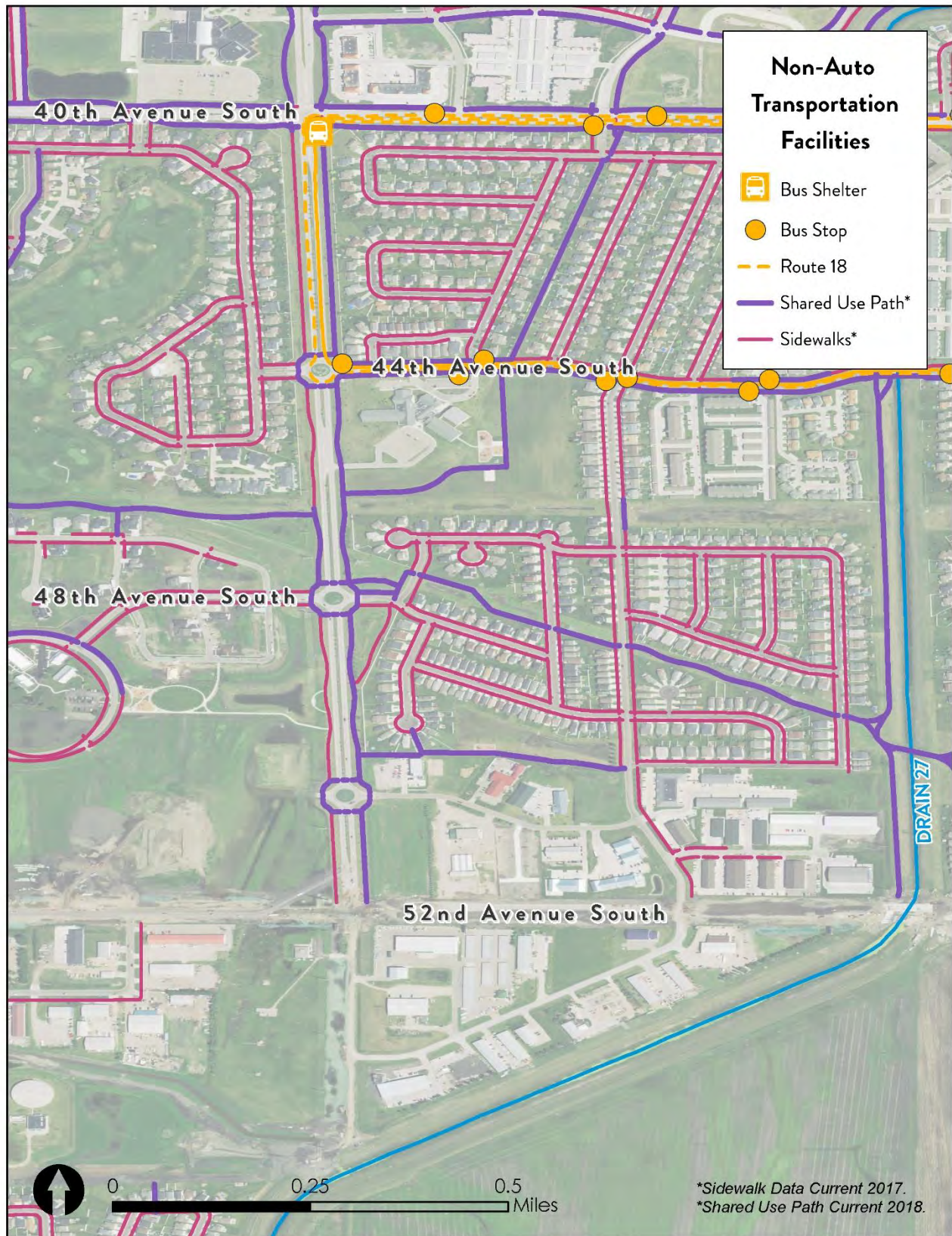
Transit Facilities

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 40th Avenue and 44th Avenue.

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



Figure 14: Pedestrian, Bicycle, and Transit Facilities



VEHICLE TRAFFIC CONDITIONS

DATA COLLECTION

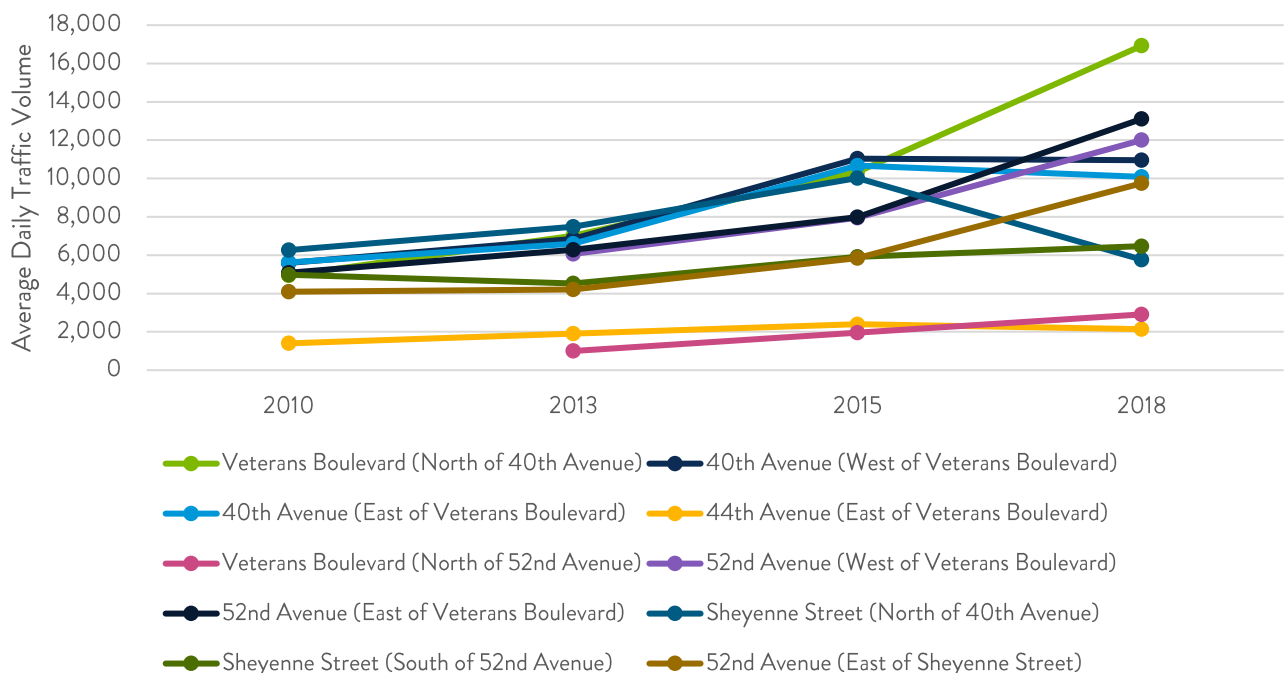
Typically, data collection for a corridor study would involve collecting the most recent traffic data, including daily traffic volumes and turning movement counts. However, this corridor study is being conducted during the COVID-19 pandemic, which has impacted normal travel patterns. Additionally, there has been a significant amount of construction within the area, including 52nd 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 40th Avenue), as well as along 52nd 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 52nd 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 nd Street and 40 th 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 th Street and 52 nd 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

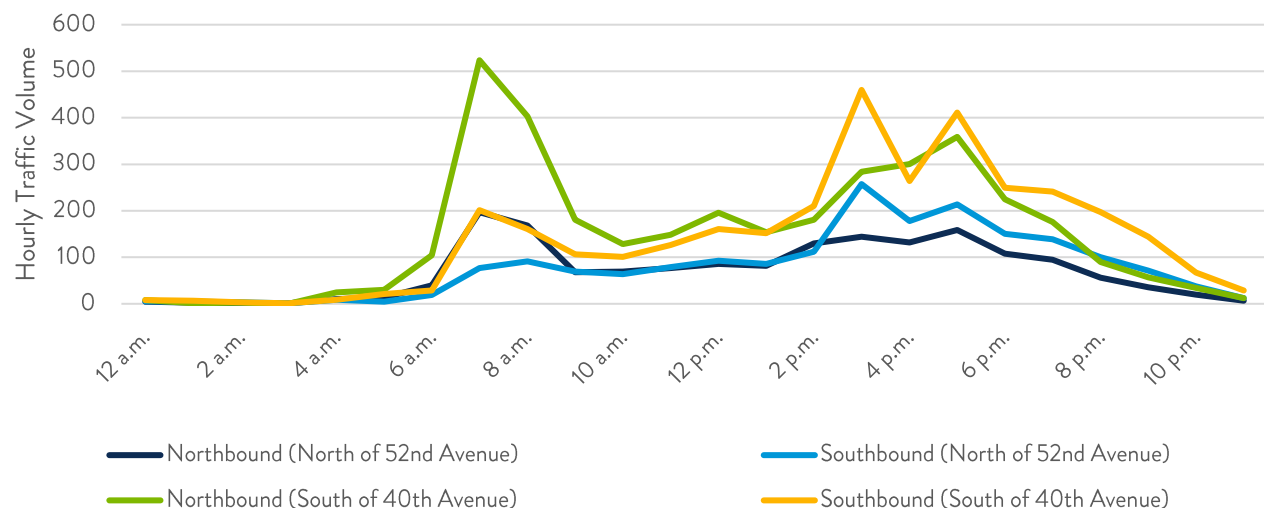
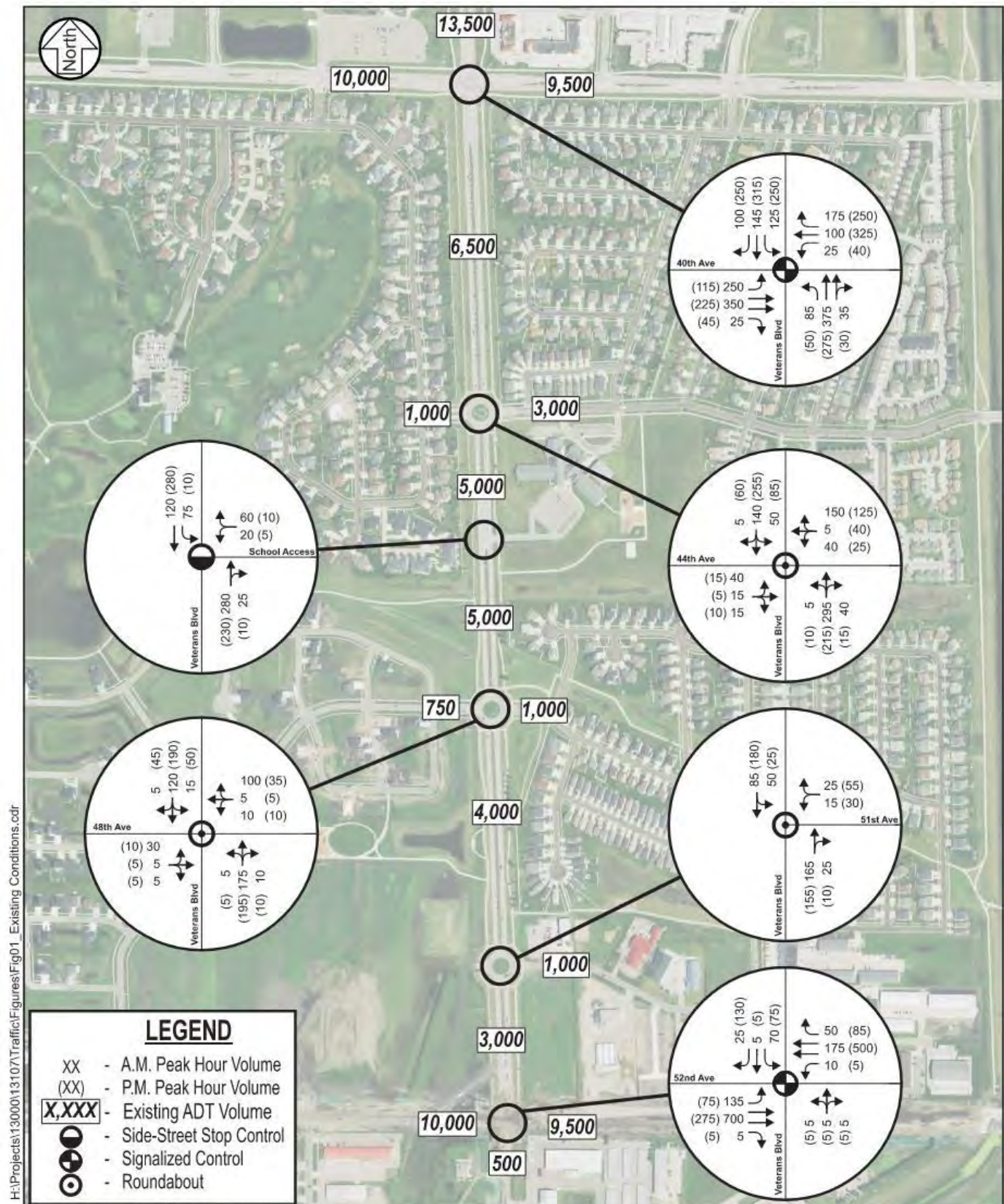


Figure 17: Existing Traffic Volumes



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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 queueing issues at the Veterans Boulevard and 40th Avenue intersection:

- » The westbound through movement's 95th 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 95th 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 th Avenue	Signal	C	21 sec.	C	24 sec.
Veterans Boulevard / 44 th Avenue	Roundabout	A	5 sec.	A	6 sec.
Veterans Boulevard / School Access	Stop	A / B	12 sec.	A / B	11 sec.
Veterans Boulevard / 48 th Avenue	Roundabout	A	4 sec.	A	5 sec.
Veterans Boulevard / 51 st Avenue	Roundabout	A	4 sec.	A	4 sec.
Veterans Boulevard / 52 nd 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 40th Avenue or 44th 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. Table 6 shows the crash and severity rates.

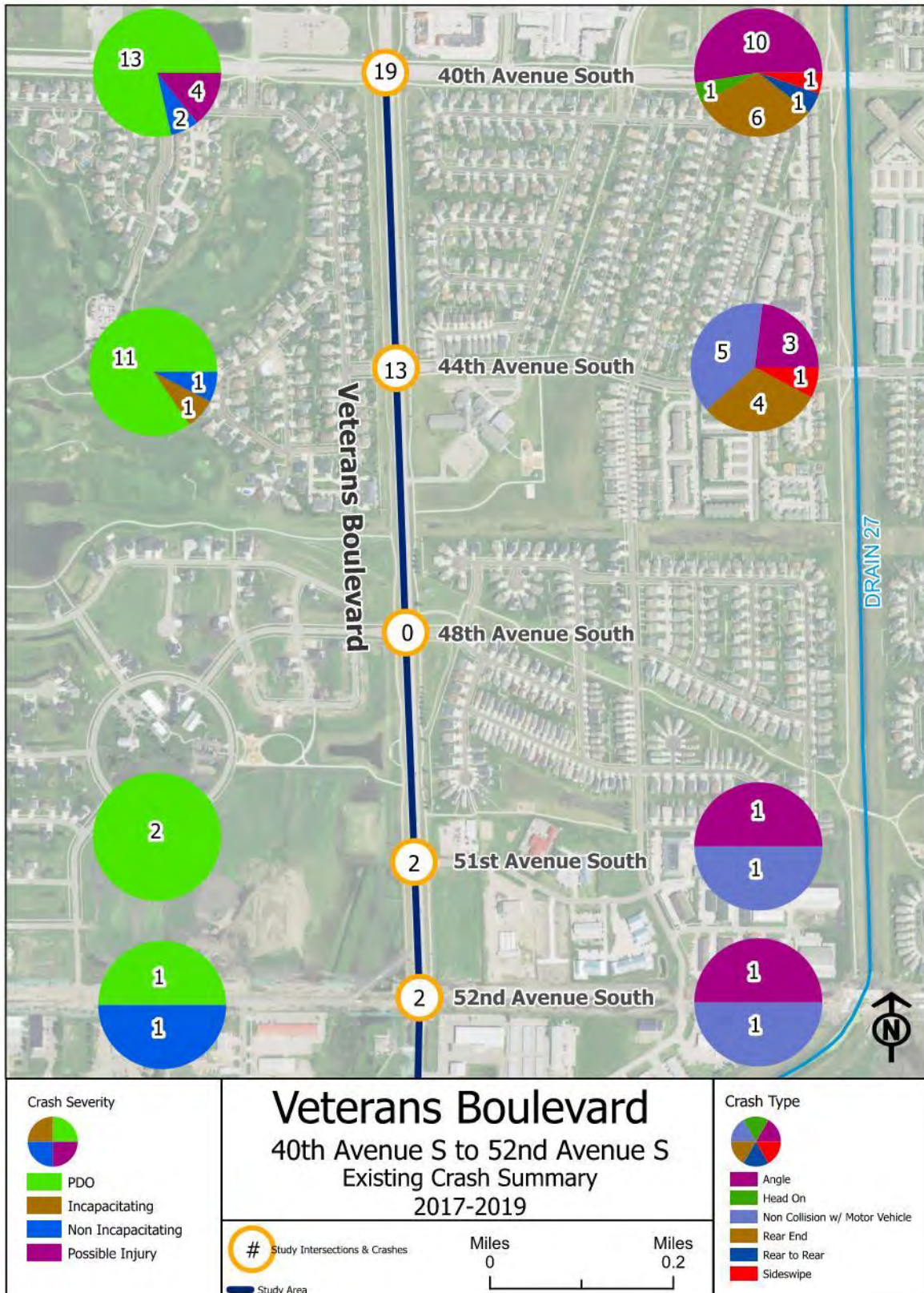
Table 6: Existing Crash and Severity Rate Comparison

Intersection	Traffic Control	Crash Rates			Severity Rates		
		Actual	Average*	Critical*	Actual	Average*	Critical*
Veterans Boulevard / 40 th Avenue	Signal	0.88	0.52	0.95	0.00	0.44	4.58
Veterans Boulevard / 44 th 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 th Avenue	Roundabout	0.00	0.32	1.01	0.00	0.36	11.75
Veterans Boulevard / 51 st Avenue	Roundabout	0.46	0.32	1.13	0.00	0.31	15.14
Veterans Boulevard / 52 nd 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 44th Avenue intersection has a crash rate above the critical crash rate.

From an intersection severity rate perspective, only the Veterans Boulevard and 44th 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 can be partially explained by the bicyclist injury crash at this location. Potential safety improvements will be identified later in this study process.

Crash Hot Spots

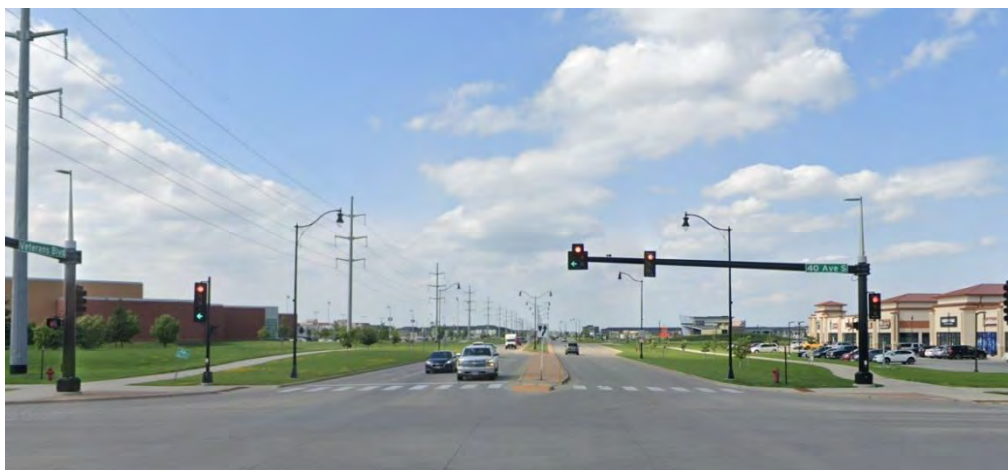
Based on the critical crash and severity rate analysis, two locations justify a more in-depth evaluation of existing crash trends.

Veterans Boulevard and 40th Avenue

The Veterans Boulevard and 40th 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 44th 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.

- » Future Functional Classification. North of 52nd Avenue, Veterans Boulevard is unclassified, but is expected to be classified as a minor arterial. However, south of 52nd Avenue, the corridor is unclassified with no immediate plans for classification. This study will need to determine the corridor's functional class and develop a form that reflects it.
- » 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 40th 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 40th Avenue or 44th Avenue. There were no fatal crashes along the corridor, although there was one incapacitating injury crash that occurred at 44th Avenue (bicyclist crash). Only the Veterans Boulevard and 44th Avenue intersection has a crash rate and severity rate above the critical rates for intersections with similar characteristics.