Sheyenne Street Corridor Study

PHASE II: DOWNTOWN SHEYENNE STREET

FINAL REPORT

West Fargo, North Dakota

2016

moore engineering, inc.

KLJ

Glossary of Commonly Used Terms

Access Management: Access management is the process of balancing acceptable access to land uses while maintaining roadway safety and mobility by control access location, design, spacing and operation.

American Association of State Highway and Transportation Officials (AASHTO): The American Association of State Highway and Transportation Officials sets specifications, protocols and guidelines to be used in highway design and construction in the United States.

Americans with Disabilities Act of 1990 (ADA): This is a civil rights law which prohibits discrimination based on disability. It requires reasonable accommodations and imposes accessibility requirements on public accommodations. As it relates to transportation, reasonable accommodation would include curb ramps, detectable warning signs, wide sidewalks, minimal slopes, etc.

Average Daily Traffic (ADT): Average Daily Traffic is the number of cars using a given segment of roadway on an average day.

Environmental Justice: Environmental justice seeks to avoid, minimize or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects on minority and low-income populations.

Environmental Protection Agency (EPA): The federal regulatory agency responsible for administering and enforcing federal environmental laws.

Federal Highway Administration (FHWA): The Federal Highway Administration is a division of the United States Department of Transportation oversees federal funds for roadway construction and maintenance as well as performing and sponsoring research in the areas of roadway safety, congestion, highway materials and construction methods.

Highway Capacity Manual (HCM): The Highway Capacity Manual is produced by the Transportation Research Board of the National Academies of Science. It provides concepts, guidelines and computations to estimate the capacity and quality of service for various roadway facilities, now including transit, pedestrians and bicycle facilities.

Intelligent Transportation Systems (ITS): Intelligent Transportation Systems is the application of advanced technologies to improve the efficiency and safety of transportation systems.

Institute of Transportation Engineers (ITE): The Institute of Transportation Engineers is an international education and scientific association of transportation professionals who are responsible for meeting mobility and safety needs.

Level of Service (LOS): Level of Service is a qualitative measure used to relate the quality of service for a given transportation network. It often reflects the ease of traffic flow on a scale of “A” to “F”, with free-flow being rated “A” and complete congestion “F”.

Long Range Transportation Plan (LRTP): A long range transportation plan is the defining vision for the region’s transportation systems and services. It indicates all of the transportation improvements scheduled for funding in the next 20 years.

Manual of Uniform Traffic Control Device (MUTCD): The Manual of Uniform Traffic Control Devices is a document issued by the Federal Highway Administration to specify the standards by which traffic signs, road surface markings and signals are designed, installed and used.

Glossary of Commonly Used Terms

Metro COG: Metro COG is the regional policy body as required by the federal government for urbanized areas with populations over 50,000. It is responsible for carrying out the metropolitan transportation planning requirements of federal highway and transit legislation.

National Cooperative Highway Research Program (NCHRP): The National Cooperative Highway Research Program conducts research in areas affecting highway planning, design, construction, operation and maintenance in the United States. It is managed by the Transportation Research Board and supported by federal agencies, state departments of transportation and other nonprofit organizations.

Pedestrian Refuge Island: A pedestrian refuge island is a small section of pavement or sidewalk where pedestrians can stop before finishing crossing a roadway.

Study Review Committee (SRC): The Study Review Committee is a group of stakeholders that performs technical review and advisory functions during the study development process.

Transportation Improvement Plan (TIP): A transportation improvement plan is a document prepared by a metropolitan planning organization that lists projects to be funded with federal funds for the next one- to three-year period.

Travel Demand Model (TDM): A travel demand model is a computer model that is used to estimate travel behavior and demand for a specific future time frame, based on a number of assumptions, like jobs or housing in a certain location.

Trip Generation: Trip generation predicts the number of trips originating or ending at a specific location.

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Executive Summary

West Fargo is a rapidly expanding city that has more than doubled in size since 2000. With the population and physical expansion of the city has come strong commercial growth concentrated in the newer parts of the city, leaving the older downtown area to stagnate. As West Fargo has become built out, interest in reviving downtown has been renewed.

This Sheyenne Street corridor is a three lane roadway that stretches from Main Avenue south to 13th Avenue running through West Fargo's downtown. The character of this one mile section changes from a traditional downtown with offices, restaurants and small retail stores on the north side to a residential corridor with single- and multi-family housing on the south side.

A major redevelopment has been proposed spanning nearly two large blocks on the west side of Sheyenne Street, which will change the entire character of downtown West Fargo. It is expected to be a catalyst for interest and activity in the area, bringing new life and supporting a thriving downtown. The purpose of this study is to highlight the current and future expected conditions of the corridor and present strategies to exist deficiencies and transform the transportation network from an arterial roadway to one that supports improved safety and multimodal operations.

Summary of Existing and Future Conditions

Safety

Safety is often a function of traffic control, roadway geometry and access. From Main Avenue to 13th Avenue, Sheyenne Street has a variety of factors, including access management and on-street parking, which may be contributing to crash potential.

Access Management

Access points introduce conflict and friction into the traffic stream and often increase crash rates and reduce roadway capacity. West Fargo's Municipal Code outlines 330 feet minimum acceptable spacing, which would permit eighteen access points along Sheyenne Street between Main Avenue and 13th Avenue. However, with densely spaced residential and commercial driveways, there are more than 70 access points. Consolidating and realigning access points where possible will improve safety for all modes of transportation.

7th Street

Eleven crashes occurred at this intersection, with more than a third occurring when southbound vehicles failed to stop. After time, motorists may begin to disregard the all-way stop control if they rarely encounter conflicting traffic. Additionally, long queues during peak hours contributed to rear-end type crashes. Both of these crash types can be mitigated with improvements recommended in this report.

Operations

At 7th Avenue, the all-way stop control leads to poor operations during peak periods increasing crash potential as long queues and delays interfere with motorist expectancy. During off-peak periods, the lack of conflicting traffic results in motorists treating the stop as a yield, increasing the potential for dangerous angle crashes. This intersection operates deficiently during the A.M. and P.M. peak by 2040 for all growth scenarios.

At 13th Avenue, the A.M. and P.M. peak experiences acceptable operations through 2040 for all growth scenarios.

Multimodal Facilities

In urban areas, especially downtowns, alternative modes of transportation, like walking, biking and transit, are important components of the transportation system.

Pedestrian Facilities

Sidewalks are provided on both sides of Sheyenne Street throughout the corridor. However, north of 7th Avenue, there is no buffer between the sidewalk and the roadway, and frequently light and sign structures are placed within the sidewalk reducing the effective width below City of West Fargo sidewalk width standards. ADA deficiencies are present as well, including the lack of curb ramps and truncated domes, broken and impassable sidewalks. Finally, there are a lack of protected crossings, increasing vehicle-pedestrian conflict potential.

Bicycle Facilities

There are no bicycle facilities along the corridor. With heavy truck traffic, most cyclists are uncomfortable riding on the roadway. Video data and field reviews both found cyclists using the sidewalk, despite West Fargo ordinances prohibiting cyclists on sidewalks.

Transit

Route 16's hourly service that runs on 13th Avenue and 7th Avenue with a stop at the West Fargo High Rise, is within one-quarter mile of most locations in the study area. However, the northernmost area of the corridor is left underserved by transit. Analysis shows that many areas in this underserved area have a residential density high enough to support hourly bus service.

Parking

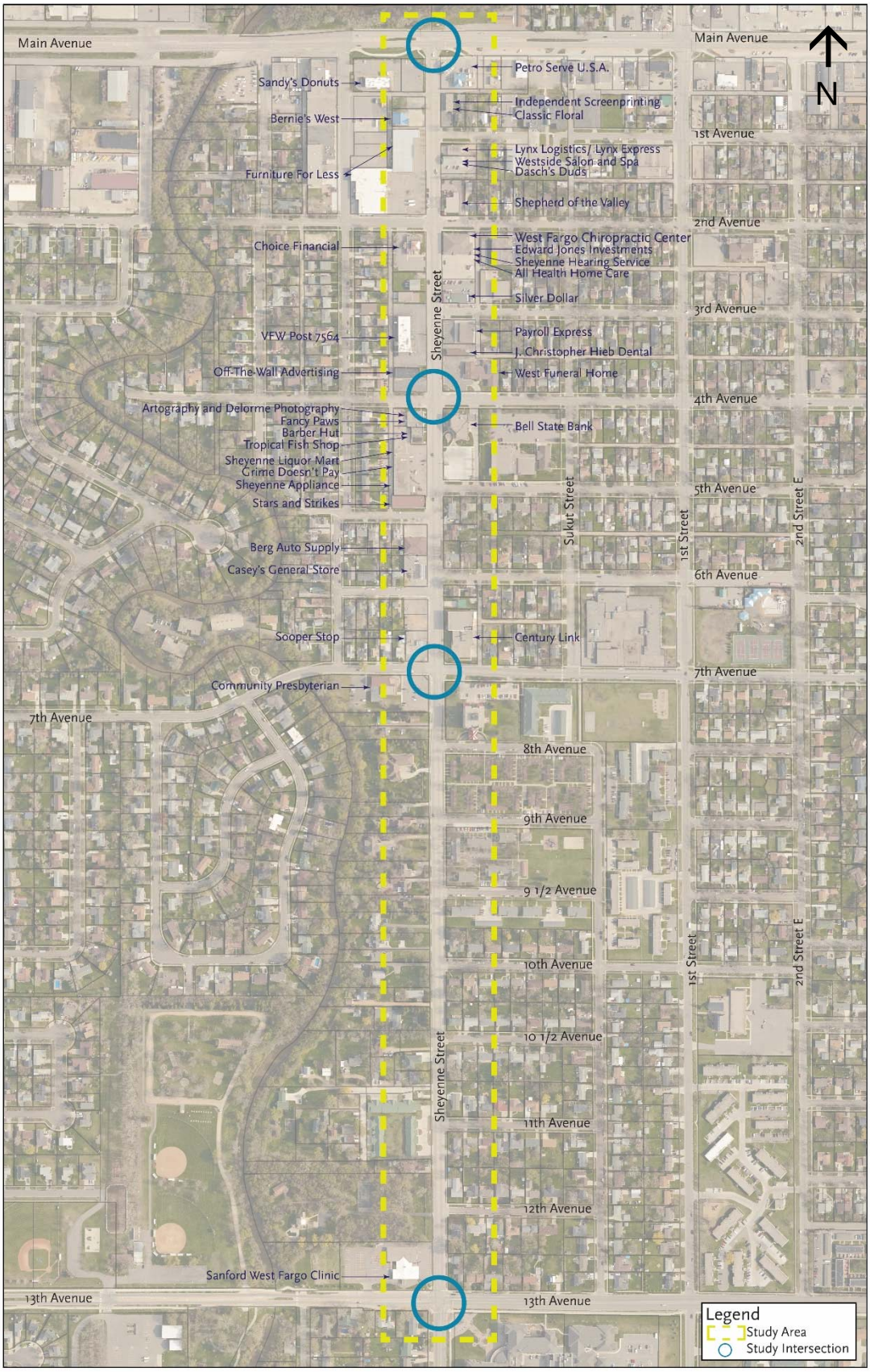
The right balance must be struck between not providing enough parking, which would deter individuals from patronizing existing and future businesses, and providing too much parking, which has negative environmental impacts through increased impervious surface and financial impacts by using space for parking instead of taxable developments. With 230 on-street parking spaces and 820 off-street parking spaces, parking supply is high. Parking demand analysis showed that at any point of the day, whether weekday or weekend, drivers are likely to find a parking surplus at any location along the corridor. Even during the noon hour, the study hour with the heaviest parking demand, 760 spaces were still available. This suggests that current parking requirements may be too high.

Summary of Redevelopment Scenarios

Redevelopment is a major consideration when determining the future needs of a roadway, especially considering the major proposed redevelopment that would include a large multi-story building with significantly greater traffic generation and parking demand. Four redevelopment scenarios were analyzed, ranging from a No Redevelopment Scenario to a High Redevelopment Scenario where 50 to 60 percent of the front facing properties are redeveloped.

Under all redevelopment scenarios, Main Avenue and 13th Avenue operates efficiently at LOS "D" or better during both peak hours. Under existing geometry, 4th Avenue becomes deficient beginning with the Medium Redevelopment Scenario, however proposed access changes would reroute traffic from the west approach of 4th Avenue to 3rd Avenue or 5th Avenue which should mitigate most deficiencies. 7th Avenue is deficient under all scenarios.

FIGURE 1: STUDY AREA



Summary of Prioritized Improvements

A variety of short-term and visionary alternatives were presented to support multimodal operations, including bicycle facilities, traffic calming and control, roadway cross-sections, access management, parking, transit and truck routing.

- **Redevelopment Accommodations.** Improvements related to the redevelopment, including closing the west approach of 4th Avenue, should be coordinated with the actual redevelopment.
- **Traffic Control at 4th Avenue.** A rectangular rapid flashing beacon and pedestrian refuge island will provide a safe and efficient pedestrian crossing to the redevelopment and new park. It has an estimated cost of $30,000.
- **Traffic Control at 7th Avenue.** Future operations at 7th Avenue are expected to produce a minute of delay per vehicle and queues in excess of 300 feet. With the imminent redevelopment, it is recommended a traffic control signal be installed as soon as feasible. It has an estimated cost of $300,000.
- **Three-Lane Section with Bulb Outs from Main Avenue to 7th Avenue.** This roadway cross-section alternative would maintain one lane in each direction and the two-way left turn lane, but narrow the lanes to 10.5 feet. It would install bulb outs to improve pedestrian visibility and safety, as well as relocate lights and signs for a cleared and wider sidewalk to improve the pedestrian experience. Estimated cost is $190,000 which does not include any aesthetic improvements.
- **Separated Bicycle Lanes from 7th Avenue to 13th Avenue.** This roadway cross-section would convert the underutilized on-street parking on the east side of the roadway into separated bicycle lanes and narrow the driving lanes to 11 feet. This improvement has an estimated cost of $65,000.
- **Bicycle Facilities from Main Avenue to 7th Avenue.** A variety of bicycle improvements along 7th Avenue and 1st Street would be installed.
- **Parking Standards.** A variety of examples to revise parking standards were presented in this study. It is recommended city staff review these in an effort to establish revised parking standards for the corridor.
- **Eastbound Right-Turn Lane at Main Avenue and Sheyenne Street Intersection**. An eastbound right-turn lane is recommended to improve the approach and intersection operations. This improvement has an estimated cost of $75,000.
- **Access Management Plan.** The proposed Access Management Plan would reduce access risk by 20.6 percent along Sheyenne Street from Main Avenue to 7th Avenue. The city will need to work with property owners to remove and relocate driveways and facilitate cross-access agreements where driveways are combined. Changes to access should be completed when the roadway is reconfigured or when redevelopment occurs.
- **Aesthetics Plan.** Street scale aesthetics, traffic calming and increased land use intensity and diversity have a positive correlation on walking and biking. The aesthetics plan for Sheyenne Street from Main Avenue to 7th Avenue includes colored pavement, parking lot screening, a gateway at the Main Avenue and Sheyenne Street intersection, improved wayfinding, street furniture and outdoor seating.

TABLE 1: SUMMARY OF SHORT-TERM IMPROVEMENT PLAN INFRASTRUCTURE COSTS

Improvement	Estimated Cost
Traffic Control And Pedestrian Accommodations At 4th Avenue	$30,000
Traffic Control At 7th Avenue	$300,000
Three Lane Section With Bulb Outs On Sheyenne Street From Main Avenue To 7th Avenue	$475,000
Separated Bicycle Lanes Alternatives On Sheyenne Street From 7th Avenue To 13th Avenue	$65,000
Main Avenue Right-Turn Lane	$75,000
Estimated Total Cost For Short-Term Improvement Plan	$945,000

FIGURE 2: SUMMARY OF PRIORITIZED ALTERNATIVES

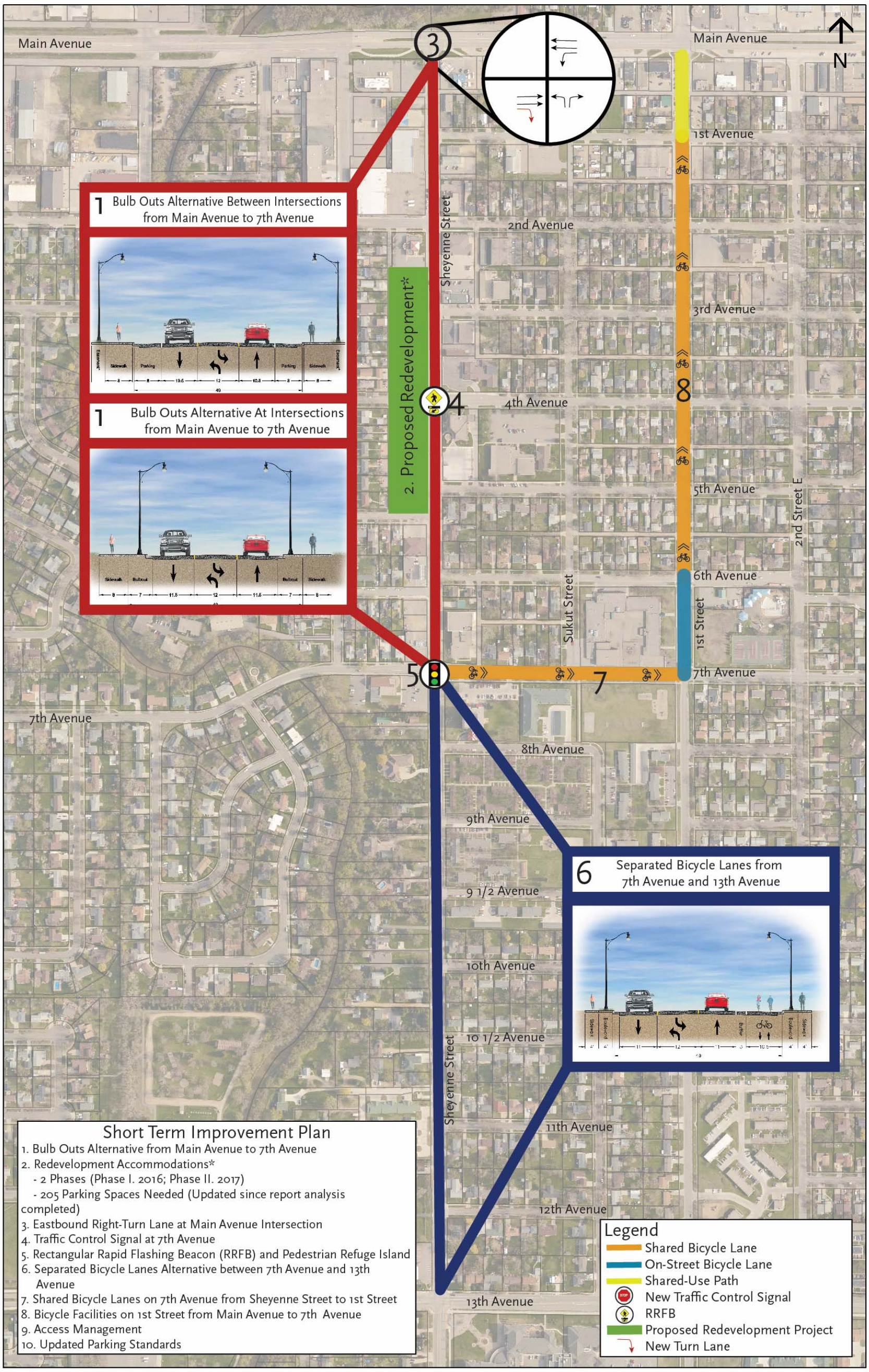


FIGURE 3: AESTHETICS PLAN FOR THREE-LANE SECTION WITH BULB OUTS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

Ⓐ 3D Rendering of Intersection

Ⓑ 3D Rendering of Plantings and Fence in Front of Parking Lot

Ⓒ Gateway to Downtown

Three-lane Section with Bulb-outs Alternative

Corridor-wide Enhancements

Artwork on Signal Cabinet

Bozeman, Montana

Wayfinding Signs

Sanford, Florida

Light Fixture with Banner Arms

North Manchester, Indiana

Street Furniture where Sidewalk Space Available

Lodz, Poland

Future Consideration for Parklet or Outdoor Seating

Minneapolis, Minnesota

Visionary Projects

A variety of "visionary" projects have been included in this report. These types of projects are not necessary for a safe and efficient multimodal transportation network, but instead would enhance connectivity to surrounding neighborhoods and parks, the streetscape and aesthetic elements and reconfigure parking and vacant and underutilized land for further redevelopment.

- **Pedestrian and Bicycle Bridges.** A trail and footbridge across Main Avenue and the Sheyenne River would connect downtown to Armour Park and the small residential neighborhood north of Main Avenue and a footbridge over the Sheyenne River at 2nd Avenue would connect the residential development west of the Sheyenne River to downtown.
- **Land Reconfiguration.** Multiple opportunities exist to reconfigure existing land uses to maximize developable land and minimize unnecessary parking and transportation elements, including closing low-volume roadways, shared parking arrangements, city owned off-street parking and converting parking lots into developable land.
- **1st Street Traffic Calming.** As congestion builds, drivers will look for a faster route with less congestion, like 1st Street. Traffic calming, like speed humps, bulb outs, medians and mini traffic circles, along 1st Street will slow vehicles and encourage them to select a different route.
- **Revise the Cross-Section to Separated Bicycle Lanes Alternative from Main Avenue to 7th Avenue.** As pedestrian and bicycle activity increases with redevelopment and improvements to multimodal facilities, the roadway should evolve to meet the new needs. At a future time, when increased bicycle activity necessitates, separated bicycle lanes should be incorporated into the roadway.
- **Downtown Park and Outdoor Event Center.** This would provide a space for new special events and congregation during events like West Fest. Along 1st Avenue South.

FIGURE 4: SUMMARY OF VISIONARY PROJECTS

I) Introduction

West Fargo is a rapidly expanding city that has more than doubled in size since 2000. With the population and physical expansion of the city has come strong commercial growth concentrated in the newer parts of the city, leaving the older downtown area to stagnate. As West Fargo has become built out, interest in reviving the downtown has been renewed.

FIGURE I-1: RESIDENTIAL AREA OF DOWNTOWN SHEYENNE STREET

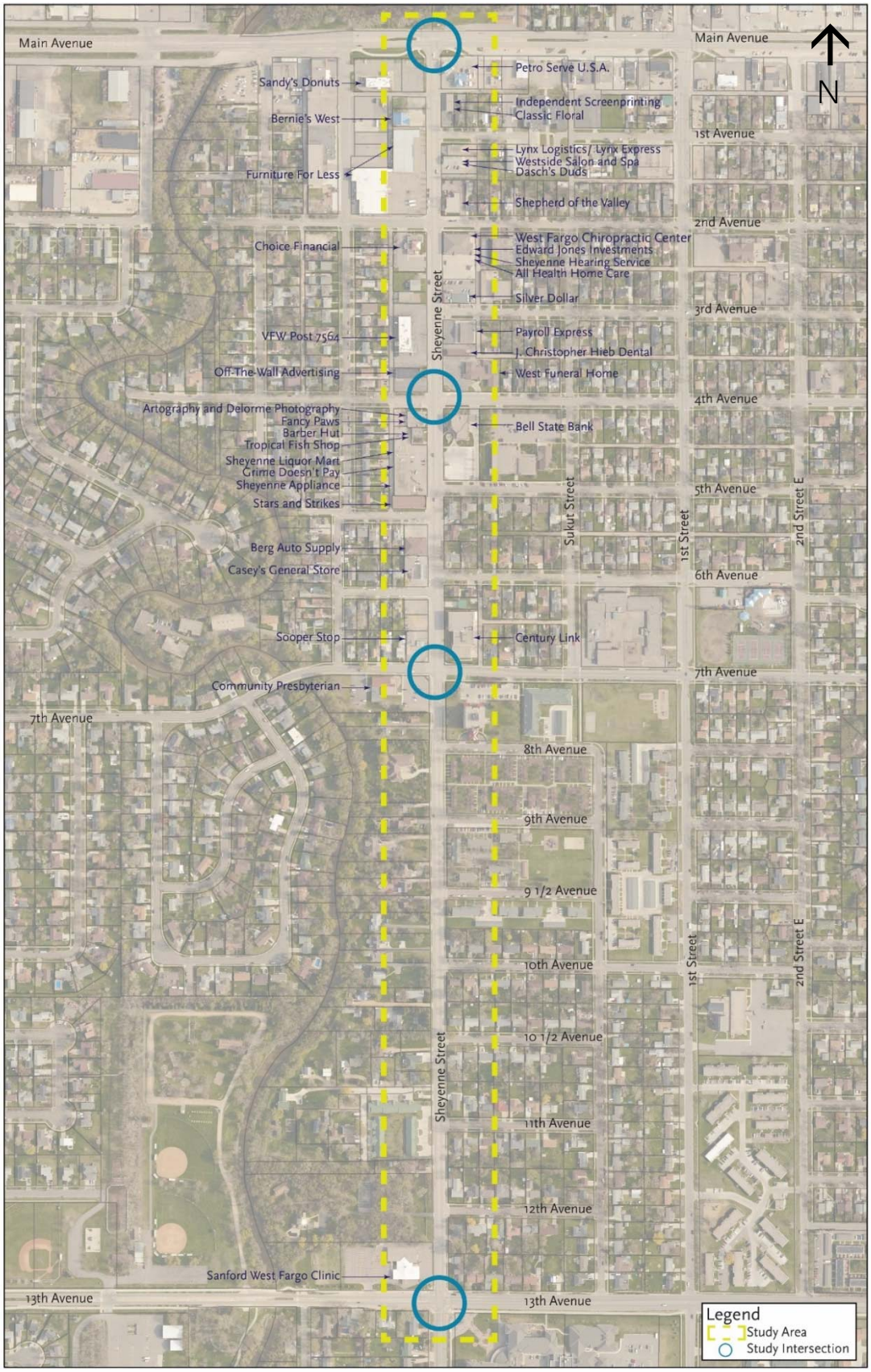
This Sheyenne Street corridor is a three lane roadway that stretches from Main Avenue south to 13th Avenue running through West Fargo's downtown. The character of this one mile section changes from a traditional downtown with offices, restaurants and small retail stores on the north side to a residential corridor with single- and multi-family housing on the south side. Good connectivity and pedestrian generators present on both sides of the roadway result in strong pedestrian traffic throughout the corridor. The industrial park in the north part of West Fargo often uses Sheyenne Street as their preferred route for shipping and receiving products.

FIGURE I-2: COMMERCIAL AREA OF DOWNTOWN SHEYENNE STREET

Maintaining the efficiency of traffic flow while creating an inviting, aesthetically pleasing and pedestrian safe downtown will be paramount to supporting the redevelopment of a thriving downtown. Metro COG, in conjunction with member local units of government, other interested stakeholders and the public at-large developed and approved the Fargo-Moorhead Metropolitan Area Complete Streets Policy Statement in 2010. The purpose of this study is to highlight the current and future expected conditions of the corridor by identifying existing and future conditions from analyses of multiple redevelopment scenarios and recommend improvements to provide reasonable accommodations for all users. The report will also present strategies to address deficiencies and multiple short-term and visionary projects to be implemented along this section of Sheyenne Street to transform the transportation network from an arterial roadway to one that supports improves safety and multimodal operations.

This study will include analysis on all facets of the transportation network: roadway capacity, multimodal facilities, safety, lighting, parking and more. It will not cover specific opportunities for redevelopment, land use, zoning or other aspects not directly related to transportation. This begins with identification of existing and future needs assessment, analysis of potential redevelopment scenarios, development of potential alternatives, including aesthetic elements and finally, the plan concludes with an implementation plan. The public involvement process occurred throughout the study including multiple Study Review Committee (SRC) meetings, two public input meetings and a Downtown Business Association meeting which was open to the public. Meeting summaries can be found in Chapter II) Summary of Public Input with all meeting documents, including minutes in Appendix B.

FIGURE I-3: STUDY AREA



II) Summary of Public Input

The study approach was a three-part process. Each step is detailed within its respective chapter or associated appendix. Figure II-1 highlights the process.

FIGURE II-1: STUDY APPROACH

- SRC Meeting #1: Presentation of Existing and Future Needs Assessment
- Downtown Business Association Meeting: Presentation of Existing and Future Needs Assessment

- SRC Meeting #2: Presentation of Redevelopment Scenarios and Alternatives
- Public Input Meeting #1: Presentation of Alternatives

- SRC Meeting #3: Presentation of Draft Report
- Public Input Meeting #2: Presentation of Draft Report

Meeting Summaries

Study Review Committee Meeting #1: Presentation of Existing and Future Needs Assessment

The first Study Review Committee (SRC) meeting summarized the existing and future needs expected along the corridor. The purpose of this meeting was to identify any and all deficiencies along the corridor. Topics covered during this meeting included multimodal facilities, safety, speed, parking availability, access management and truck traffic.

Downtown Business Association Meeting: Presentation of Existing and Future Needs Assessment

Presentation of existing and future needs was done at a regular Downtown Business Association meeting, open to the public which provided an opportunity for the public to identify any issues for the topic areas discussed in the Existing Conditions Technical Memorandum and any other the study team and SRC may have missed. A formal presentation was given, with a question-and-answer session after. Attendees were encouraged to mail or e-mail any comments. In total, more than 20 people attended the meeting.

FIGURE II-2: FORMAL PRESENTATION AT PUBLIC INPUT MEETING #2

Study Review Committee Meeting #2: Presentation of Redevelopment Scenarios and Alternatives

SRC Meeting #2 included a review of potential redevelopment scenarios, ranging from a No Redevelopment Scenario to a High Redevelopment Scenario where more than 50 percent of the corridor redeveloped and the

associated transportation impacts. It also included improvement packages based on revised roadway cross sections, safety improvements, access management and bicycle and pedestrian improvements.

Public Input Meeting #1: Presentation of Alternatives

Public Input Meeting #1 offered the public an opportunity to learn about and comment on potential improvement plans. During the formal presentation, attendees were provided with keypad polling devices to provide instantaneous feedback on the cross-section alternatives, which indicated a preference for the Three-Lane Section with Bulb Outs for Sheyenne Street from Main Avenue to 7th Avenue and the Separated Bicycle Lanes or Do-Nothing from Sheyenne Street from 7th Avenue to 13th Avenue. Attendees were given two other opportunities to provide comments including a written comment form and large boards with the alternatives and sticky notes. In total more than 27 people attended the meeting and four comments were received.

Study Review Committee Meeting #3: Presentation of Draft Report

The purpose of this meeting was to present the draft report with specific focus on the aesthetics plan and implementation plan. This meeting also discussed materials to present with the public at the final Public Input Meeting.

Public Input Meeting #2: Presentation of Draft Report

Public Input Meeting #2 worked with the public to refine the proposed improvement plan. Attendees were given opportunities to leave comments including a written comment form, as well as an opportunity to look through 3-D renderings of the proposed implementation plan. In total more than 21 people attended and five comments were received.

III) Existing Conditions Analysis

Related Studies

Two studies, one completed and one on-going, provide additional information to guide the existing conditions analysis and ultimately the recommendations for downtown West Fargo.

Sheyenne Street and Main Avenue Framework Study

This study was completed in December 2011 and focused on the economic and physical environment of downtown West Fargo. This study found that the downtown area is no longer a destination as it once was, the business mix is less desirable and redevelopment is too expensive. These factors have resulted in an aging downtown that has failed to attract new investors.

After multiple rounds of public involvement, the study team determined the significant traffic and strong surrounding neighborhoods could be a boon for redevelopment. The lack of historic buildings means that the area can be built from the ground up to support what residents prefer.

The Framework Study ultimately recommended creating a traditional main street with high density, mixed-use developments, development up to the street (parking in the back or side) and design standards to improve aesthetics. This study strongly endorsed the idea that design standards, coupled with the right public and private investments and incentives, will result in a renewed downtown.

Sheyenne Street Corridor Study Phase I

Analysis and recommendations were developed for this study that examines Sheyenne Street from 13th Avenue to 52nd Avenue. Sheyenne Street is the only north-south arterial west of I-29 that extends south of 52nd Avenue. Traffic operations and safety are already deficient on this section of Sheyenne Street and are expected to significantly deteriorate in the near future due to strong residential growth in West Fargo, Fargo and Horace.

The final recommendations for Phase I will impact this section of Sheyenne Street. Once completed, Sheyenne Street south of 13th Avenue will have adequate capacity and multimodal amenities to connect to downtown, potentially encouraging visits to downtown.

Demographics

Downtown West Fargo is just a small portion of the overall metro area. The 2013 American Community Survey five-year estimate for block groups (the smallest geographic area for which this information is available) shows that downtown West Fargo is less than 15 percent of West Fargo's total population. It tends to be older than the rest of West Fargo. It also tends to have a lower household income than the rest of West Fargo. In some locations east of Sheyenne Street median household income is less than half of the West Fargo median household income while in some locations west of Sheyenne Street, along the Sheyenne River, median household income is more than one-third higher than the West Fargo median household income.

TABLE III-1: HOUSEHOLD DEMOGRAPHICS

	Population	Median Age	Households (HH)	Rental Units	Average HH Size	Median HH Income	Zero Car HH	One Car HH
Downtown West Fargo	3,915	41.4	1,891	29.5%	2.44	$53,400	4.2%	30.0%
West Fargo	27,014	33.4	11,277	31.6%	2.48	$68,360	2.8%	26.4%
Fargo-Moorhead MSA	154,080	31.7	69,501	44.1%	2.27	$52,590	6.8%	32.1%

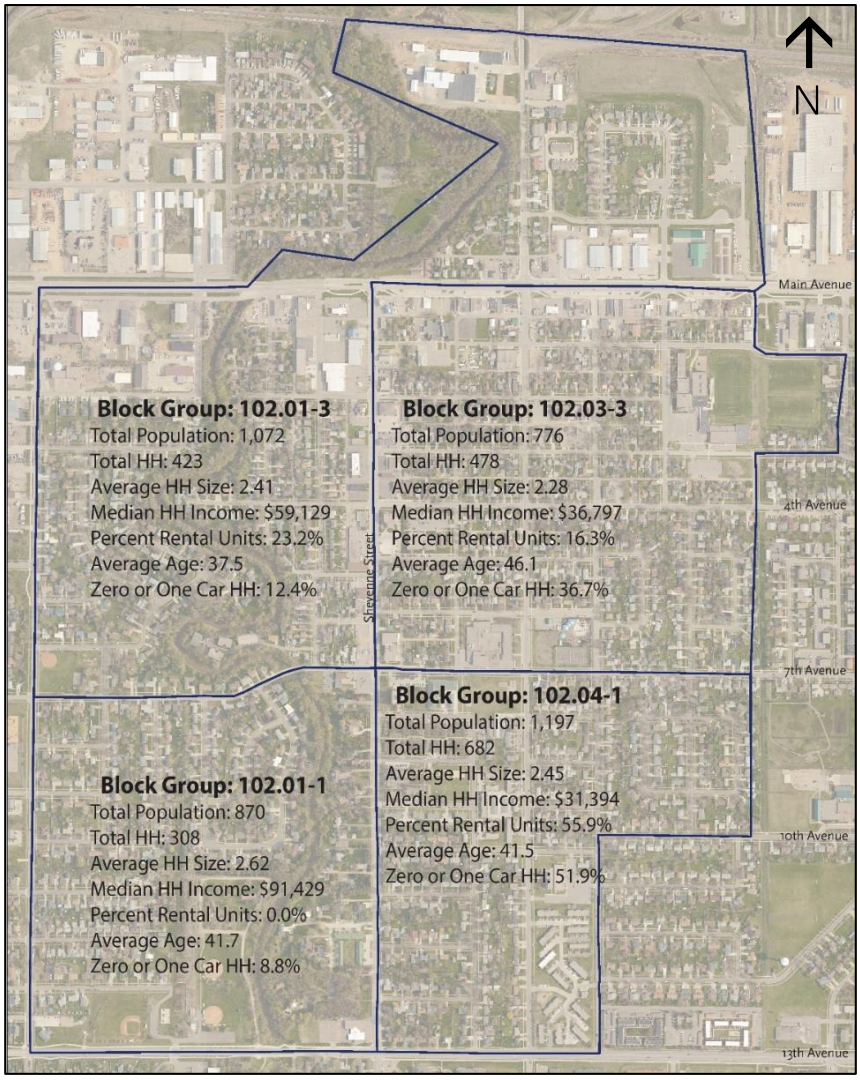
Downtown West Fargo tends towards similar unemployment rates, occupation types and means of transportation as West Fargo and the metro area as a whole.

TABLE III-2: EMPLOYMENT STATISTICS

	Unemployment	Occupations	Means Of Transportation
Downtown West Fargo	2.6%	34% Management, Business, Science and Art 23% Sales and Office Occupations	84.3% Drive Alone
West Fargo	1.7%	38% Management, Business, Science and Art 27% Sales and Office	85.8% Drive Alone
Fargo-Moorhead MSA	3.1%	38% Management, Business, Science and Art 25% Sales and Office	83.8% Drive Alone

Evaluating each block group individually highlights additional transportation characteristics and needs. West of Sheyenne Street, block groups 102.01-1 and 102.01-3 tend to be larger lot, single family homes with higher median household incomes, higher average household size and access to more than one vehicle per household. These types of households may tend towards higher trip generation rates. On the east side of Sheyenne Street is lower average income and higher numbers of zero or one car households, suggesting that improved multimodal facilities may be needed.

FIGURE III-1: CENSUS BLOCK GROUPS FOR DOWNTOWN WEST FARGO



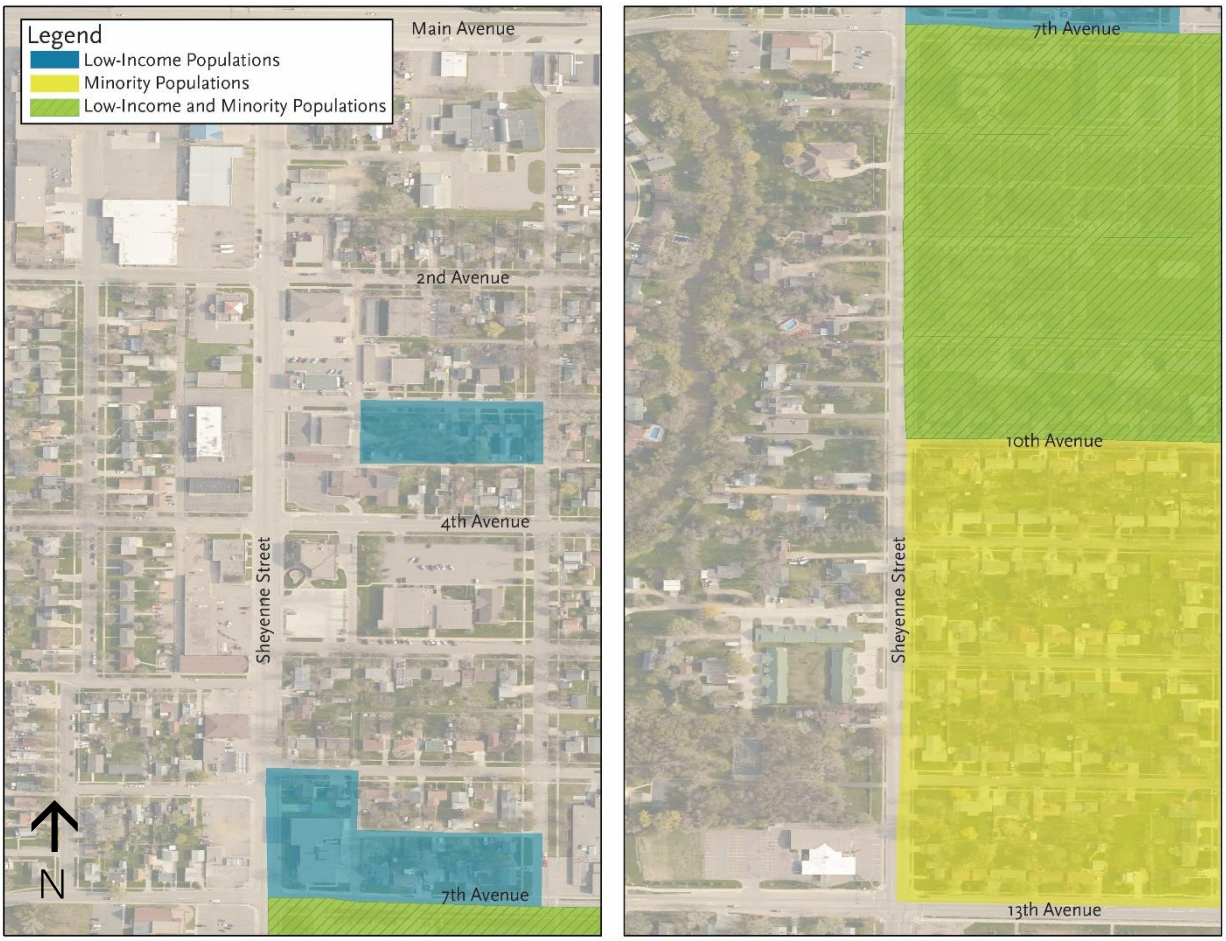
Environmental Justice

In 1997, the United States Department of Transportation (USDOT) issued its Order to Address Environmental Justice in Minority Populations and Low-Income Populations. This Order is USDOT's policy to promote the three principles in environmental justice:

- Avoid, minimize or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of reduction of or significant delay in the receipt of benefits by minority and low-income populations.

Environmental justice (EJ) in the transportation planning process ensures roadway improvements do not have disproportionately high and adverse impacts on low-income or minority populations. Metro COG regularly develops EJ analysis and maps, with the most recent completed in April 2015. A review of the April 2015 data shows significant concentrations of low-income and/or minority populations, specifically south of 7th Avenue and east of Sheyenne Street. There are some isolated areas of low-income populations north of 7th Avenue as well. A more detailed EJ analysis would be required once improvements have been identified.

FIGURE III-2: ENVIRONMENTAL JUSTICE AREAS



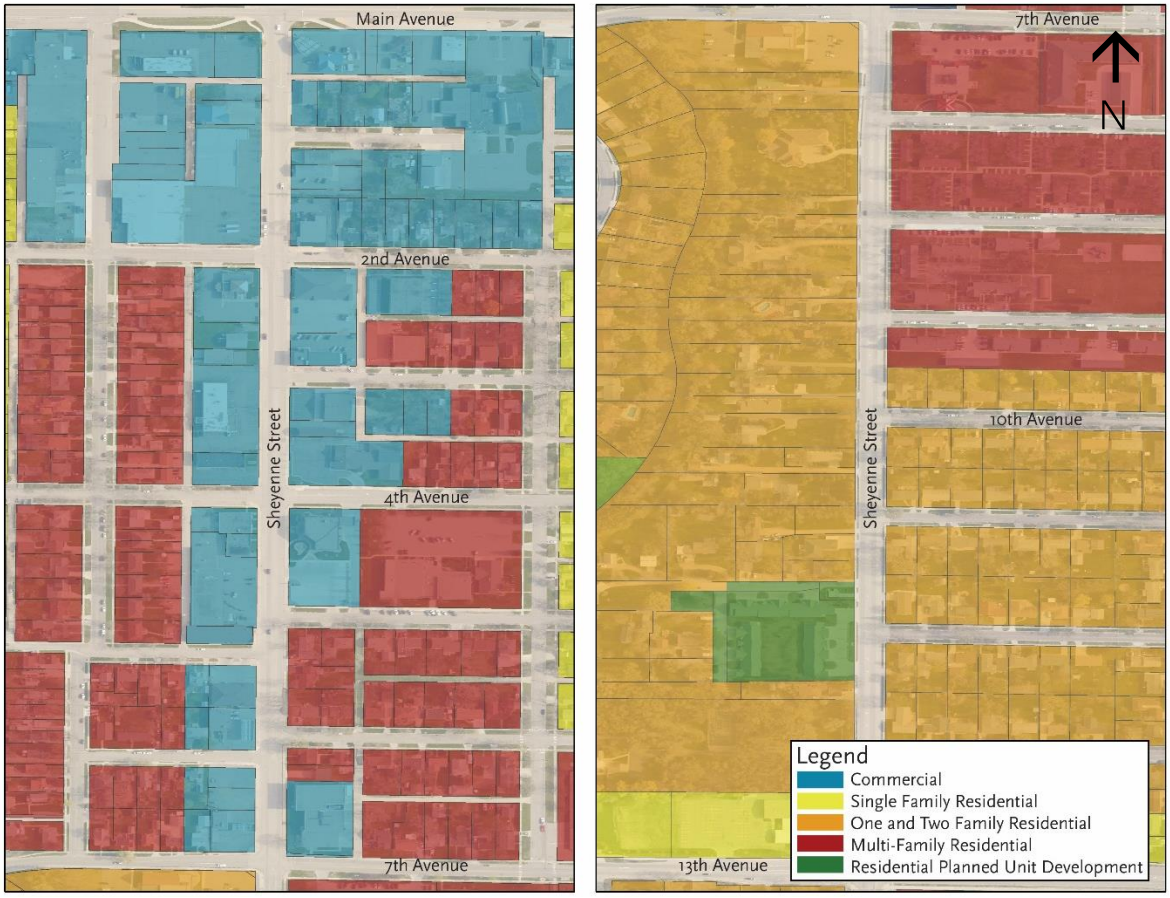
Source: Metro COG

Existing and Future Land Use

Land use can have many implications on the characteristics of a neighborhood and the efficiency of its transportation network. For example, a neighborhood that is only residential requires commuting to work resulting in unbalanced directional flows and strong peaking characteristics, reducing the overall roadway capacity, while a neighborhood with only office uses means there will be few people in the neighborhood after work to support other types of businesses. However, a strong mix of residential, commercial and office uses may support individuals working, shopping and eating out closer to home, impacting the transportation network less.

West Fargo uses the Sheyenne Street Corridor overlay district to permit mixed-use development between Main Avenue and 7th Avenue. Within this overlay district, site design standards including orientation, materials and parking location, are laid out to follow the Sheyenne Street and Main Avenue Framework. This overlay only impacts properties with frontage on Sheyenne Street. North of 7th Avenue, 44.0 percent of the lots within one block of Sheyenne Street are zoned for commercial use, while the rest of the area is zoned for residential (single, two-family and multi-family residential). South of 7th Avenue the uses are exclusively residential.

FIGURE III-3: EXISTING LAND USE



Physical Characteristics of Sheyenne Street

Typical Section

The Sheyenne Street typical section is approximately the same through the length of the corridor. The entire cross section is approximately 67 feet wide, with a width of 51 feet back-of-curb to back-of-curb. Both north and south of 7th Avenue, there is an 11 foot parking lane and turning lane. However, north of 7th Avenue, eight foot sidewalks with no grassy boulevard are present, while south of 7th Avenue, there are four foot sidewalks with four foot grassy boulevards.

FIGURE III-4: TYPICAL CROSS SECTION NORTH OF 7TH AVENUE

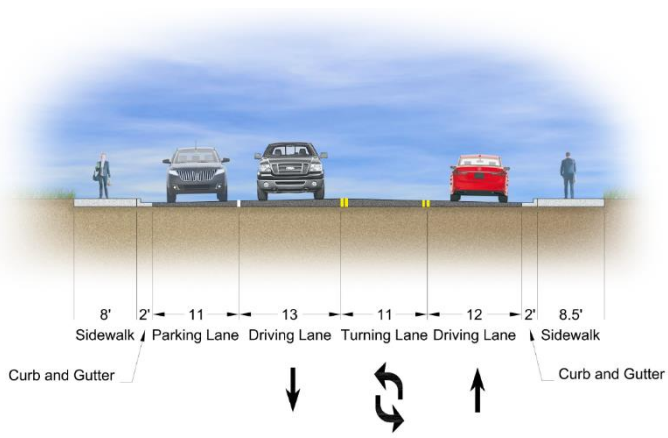
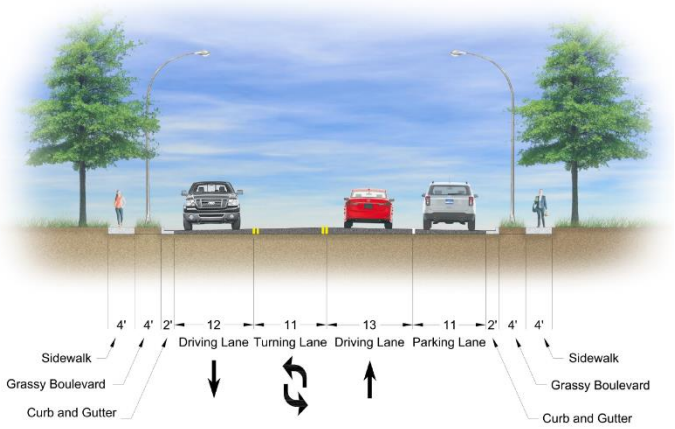


FIGURE III-5: TYPICAL CROSS SECTION SOUTH OF 7TH AVENUE



Aesthetics

Providing an aesthetically pleasing streetscape can have many positive effects on the transportation network, particularly to encourage walking and bicycling. North of 7th Avenue, the corridor is dominated by pavement, with very little greenspace. The City of West Fargo uses the light poles for hanging flower baskets and banners. The lack of separation between sidewalks and roadways lowers pedestrian comfort.

Existing lights consist of standard, non-decorative davit-type poles with cobra-head type luminaires. Lights are densely spaced between 150 feet and 250 feet apart on the west side of Sheyenne Street.

FIGURE III-6: FLOWER BASKETS AND BANNERS ON SHEYENNE STREET

Pavement Condition

Studies have found timely pavement rehabilitation has the potential to be six to 14 times more cost effective than rebuilding a deteriorated road., Another study found that rough roads add an average of $335 to the annual cost of owning a car due to damaged tires, suspensions, reduced fuel efficiency and accelerated vehicle depreciation.

Traffic Patterns

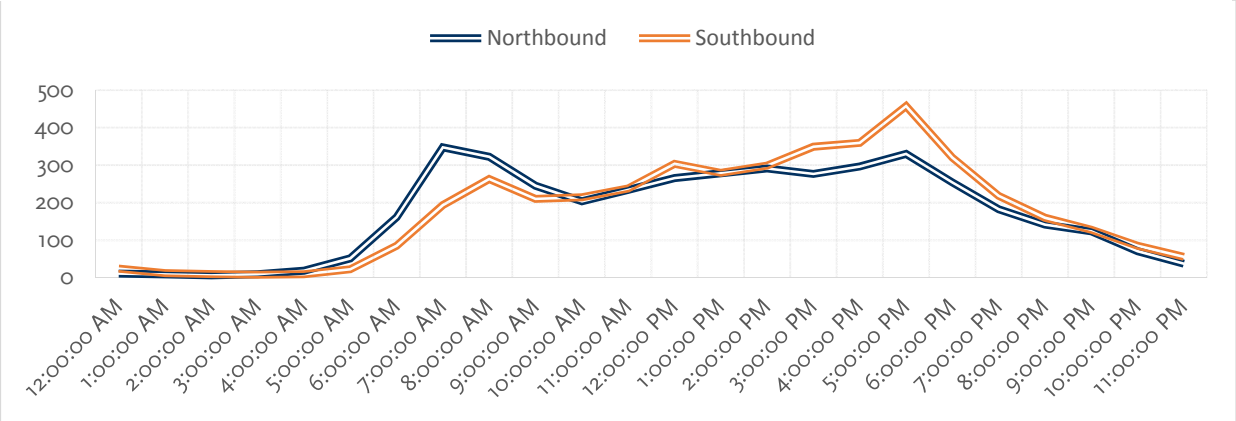
Turning movement counts were collected at three Sheyenne Street study intersections in May 2015: Main Avenue, 4th Avenue and 7th Avenue. Data collected for the Sheyenne Street Phase I study was used for the Sheyenne Street and 13th Avenue intersection. Study intersections were selected based on existing and projected volumes. The results of the traffic counts will be available in Appendix A.

Additionally, daily traffic volumes, speed and vehicle class were collected at two locations on Sheyenne Street, one between 5th Avenue and 6th Avenue and one between 7th Avenue and 8th Avenue, using roadway tube counters.

Weekday Traffic Distributions

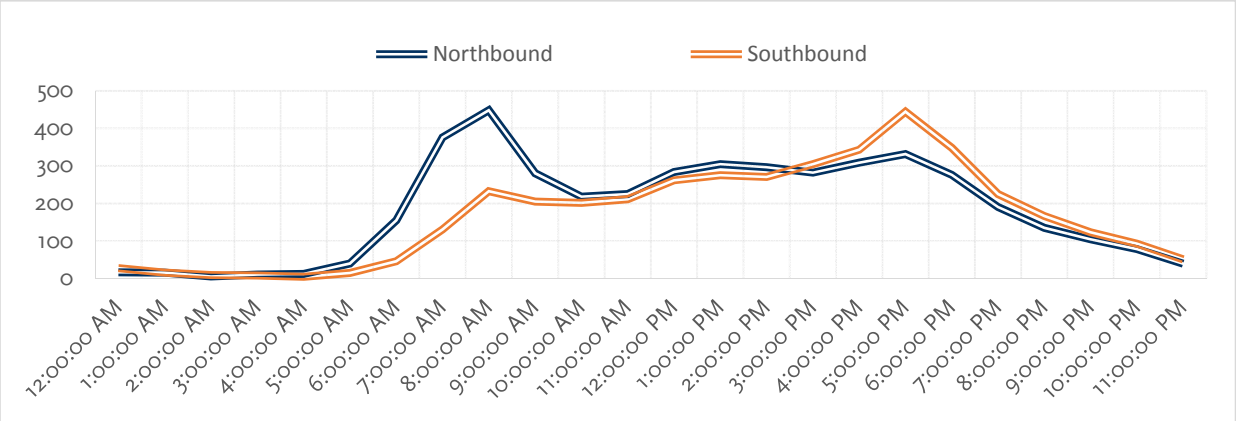
North of 7th Avenue is a mix of residential and commercial land uses with fairly steady traffic throughout the day leading to less pronounced peak hour traffic.

FIGURE III-7: WEEKDAY TRAFFIC DISTRIBUTIONS NORTH OF 7TH AVENUE



Sheyenne Street south of 7th Avenue is primarily residential uses producing pronounced peak traffic periods as the traffic funnels out of the area in the morning and back in the evening. Between 4 A.M. and 8 A.M. more than two-thirds of traffic travels northbound. During the five o'clock hour, almost two-thirds of traffic travels southbound. Unequal demand for the roadway reduces overall capacity of the road. Directional demand is almost equal for the rest of the day.

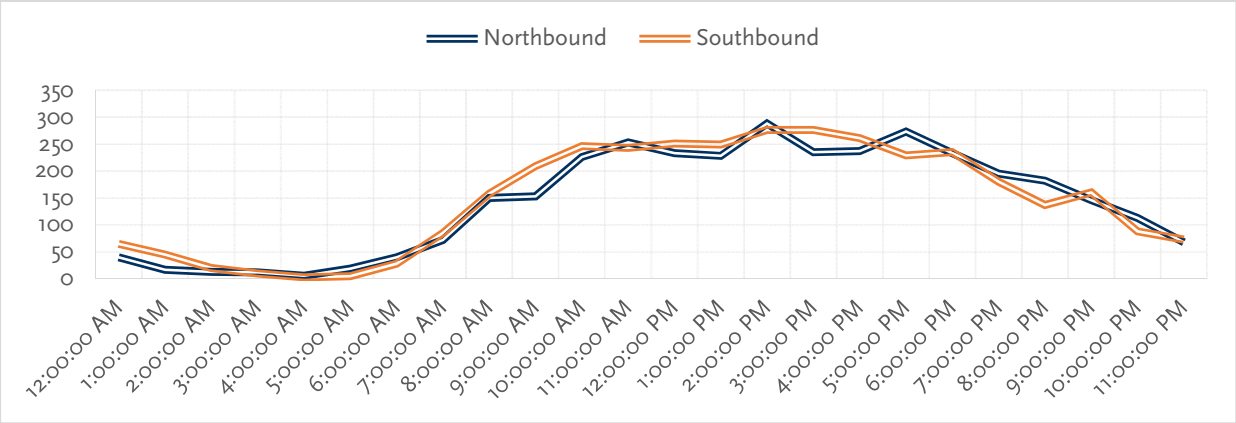
FIGURE III-8: WEEKDAY TRAFFIC DISTRIBUTIONS SOUTH OF 7TH AVENUE



Weekend Traffic Distributions

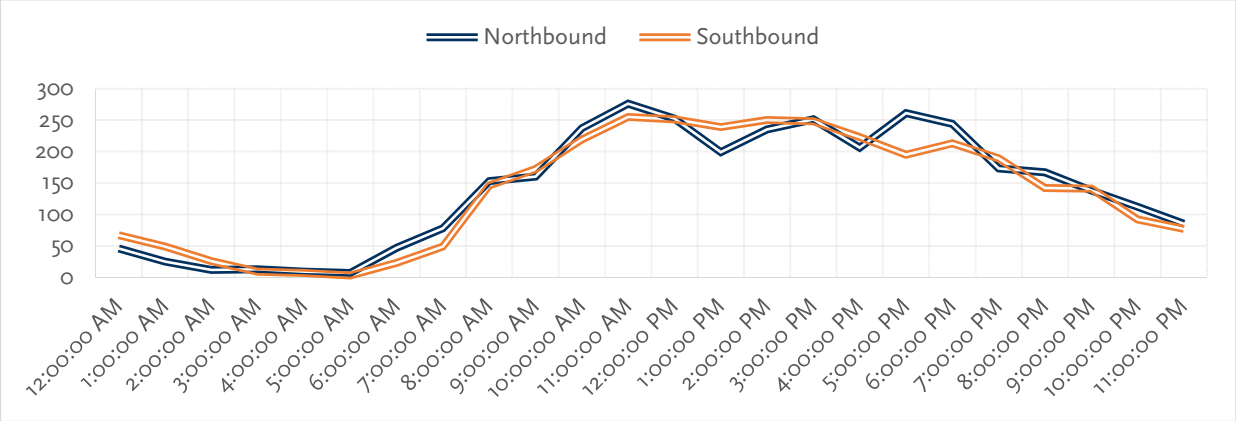
Weekend traffic does not exhibit the same patterns as weekday traffic. North of 7th Avenue, traffic is nearly consistent from 10 A.M. to 8 P.M. for northbound and southbound traffic and directional demand is nearly equal throughout the day.

FIGURE III-9: WEEKEND TRAFFIC DISTRIBUTIONS NORTH OF 7TH AVENUE



South of 7th Avenue follows much of the same pattern as the north section of the study area during the weekend.

FIGURE III-10: WEEKEND TRAFFIC DISTRIBUTIONS SOUTH OF 7TH AVENUE



Speed Data

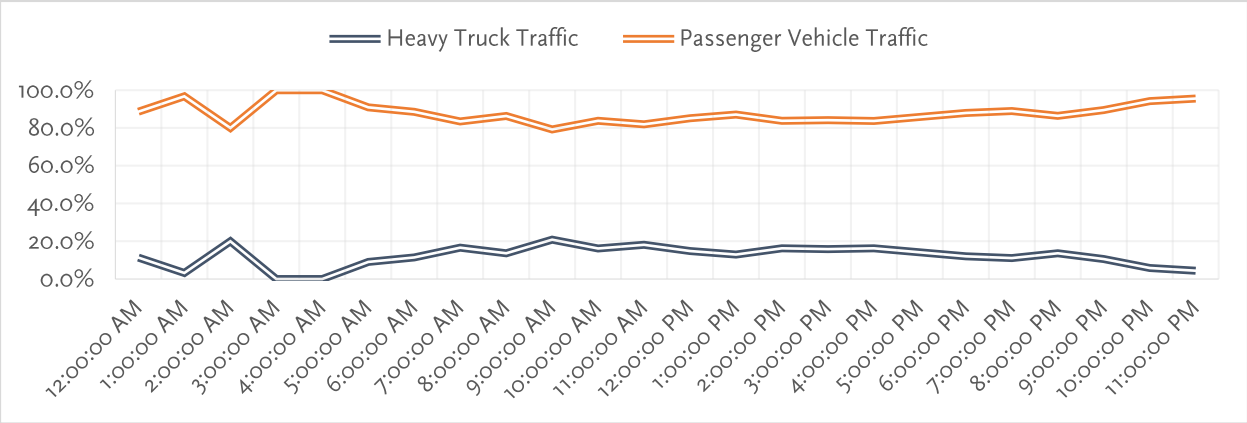
Research has shown that speeds a driver chooses to travel are a function primarily of roadway design, context and congestion, not necessarily the posted speed limit. During the data collection period, both north and south of 7th Avenue experienced no significant speeding. The 85th percentile speed, commonly used for design and designating speed limits, was between 25 and 29 miles at both locations.

Truck Traffic

Data collected during the summer of 2015 showed more than 11 percent of total traffic on Sheyenne Street is heavy vehicle/ truck traffic. However, Data collected in mid-October by NDDOT showed just 4.2 percent of total traffic on Sheyenne Street being heavy traffic.

Based on the summer data collection, more than 85 percent of daily truck traffic occurs between 7 A.M. and 6 P.M., normal business hours, with more than a third occurring between 3 P.M. and 6 P.M.

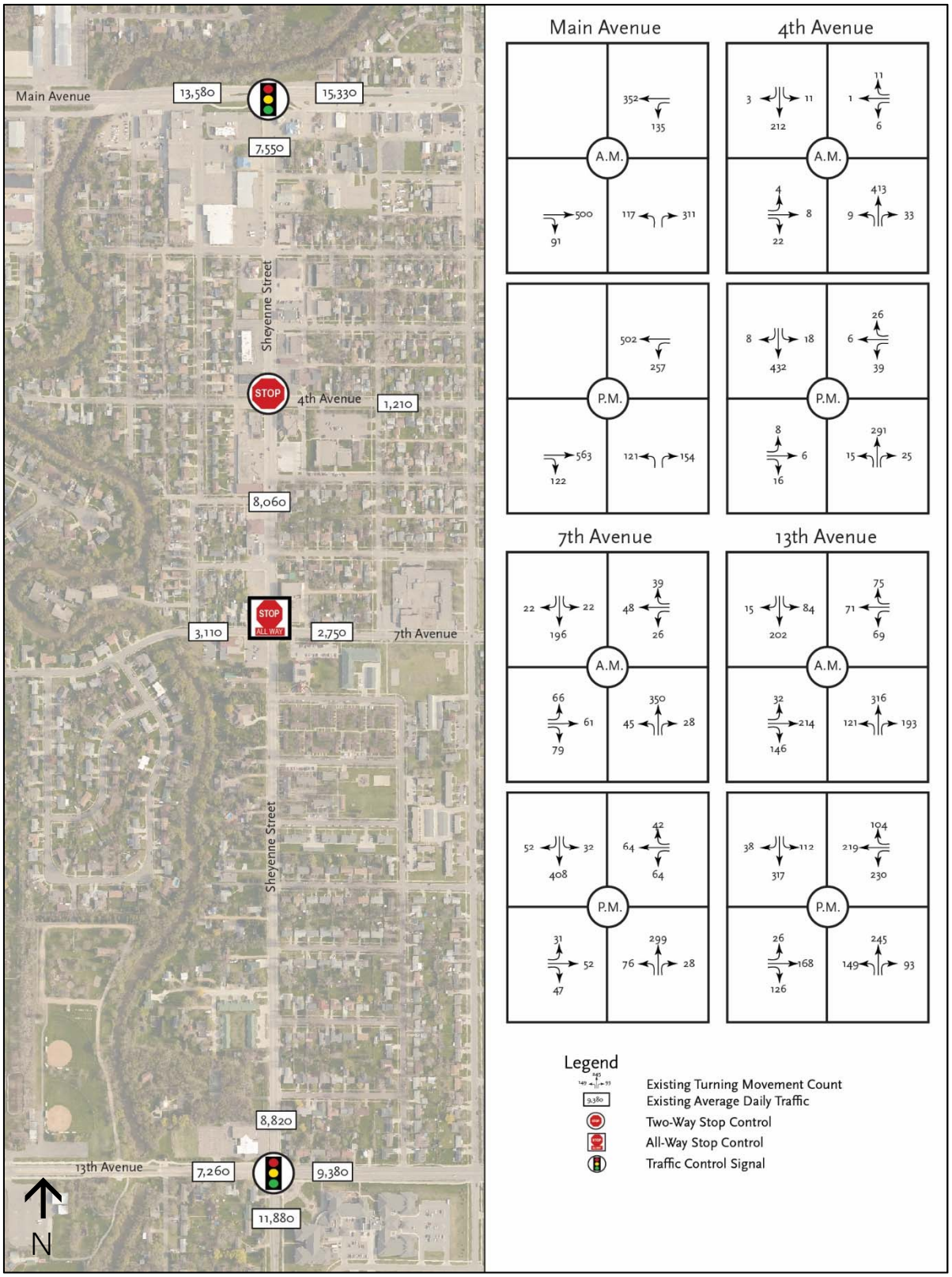
FIGURE III-11: TRUCK TRAFFIC DISTRIBUTIONS



Existing Traffic Volumes

The area directly adjacent to Sheyenne Street is mostly built out. A few vacant parcels are present, primarily north of 7th Avenue. This suggests that local traffic volumes will remain steady with any traffic growth occurring primarily outside the study area. However, later in this report, redevelopment scenarios will be analyzed. Redevelopment projects will change the expected future traffic volumes.

FIGURE III-12: EXISTING TRAFFIC VOLUMES AND TURNING MOVEMENTS



Traffic Operations

Corridor capacity was gauged via bottleneck analysis at the four study intersections along the corridor. Intersection capacity analysis was evaluated in terms of delay and level of service (LOS). LOS is a term used to describe the operational performance of transportation infrastructures elements. Essentially, LOS is a grade value that corresponds to specific traffic characteristics within a given system. At intersections, LOS is a function of average vehicle delay, whereas LOS for a roadway section is defined by the average travel speed. LOS "E" or worse is considered deficient, in accordance with the NDDOT Traffic Operations Manual published June 2015. Capacity analysis was conducted using Synchro, which applies deterministic equations published in the *Highway Capacity Manual* (HCM). HCM capacity analysis is an industry and NDDOT standard.

TABLE III-3: HCM LEVEL OF SERVICE

Control Delay (Sec/Veh)		Volume < Capacity	Volume > Capacity
Unsignalized	Signalized		
≤ 10	≤ 10	A	F
> 10-15	> 10-20	B	F
> 15-25	> 20-35	C	F
> 25-35	> 35-55	D	F
> 35-50	> 55-80	E	F
> 50	> 80	F	F

Existing LOS for both A.M. and P.M. peaks can be found in Figure III-14. Focusing only on A.M. and P.M. peaks is a mono-modal approach. It encourages designing to the highest volume of vehicle traffic instead of providing adequate facilities for all modes. However, during the off-peak periods traffic volumes are extremely low and the corridor operates very efficiently. For major arterials outside of a downtown area, traffic operations and safety would be paramount for any set of recommendations. However, for this section of Sheyenne Street, any potential roadway needs must be balanced with pedestrian, bicycle, transit parking and aesthetic needs of the corridor. Determining the future purpose of this corridor, whether to move traffic efficiently or service downtown businesses, or some combination of the two, will help prioritize the needs of the roadways.

Existing Levels of Service

Under existing conditions, all four study intersections operate acceptably at LOS "D" or better. The southbound approach at Sheyenne Street and 7th Avenue is deficient during the P.M. peak at LOS "E". This approach also produces 95th percentile queues in excess of 300 feet, blocking driveways and 6th Avenue West.

FIGURE III-13: LONG NORTHBOUND QUEUES AT 7TH AVENUE

FIGURE III-14: EXISTING LEVELS OF SERVICE

Pedestrian and Bicycle Facilities

In urban areas, especially downtowns, walking and biking are important components of the transportation system. Enhancing the ability of travelers to walk or 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". This type of roadway design offers many benefits:

- Streets designed with sidewalks, raised medians, traffic-calming measures and treatments for travelers with disabilities improves pedestrian safety. Research has shown that 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 to roadways. A recent study found that most families spend far more on transportation than food.
- 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.

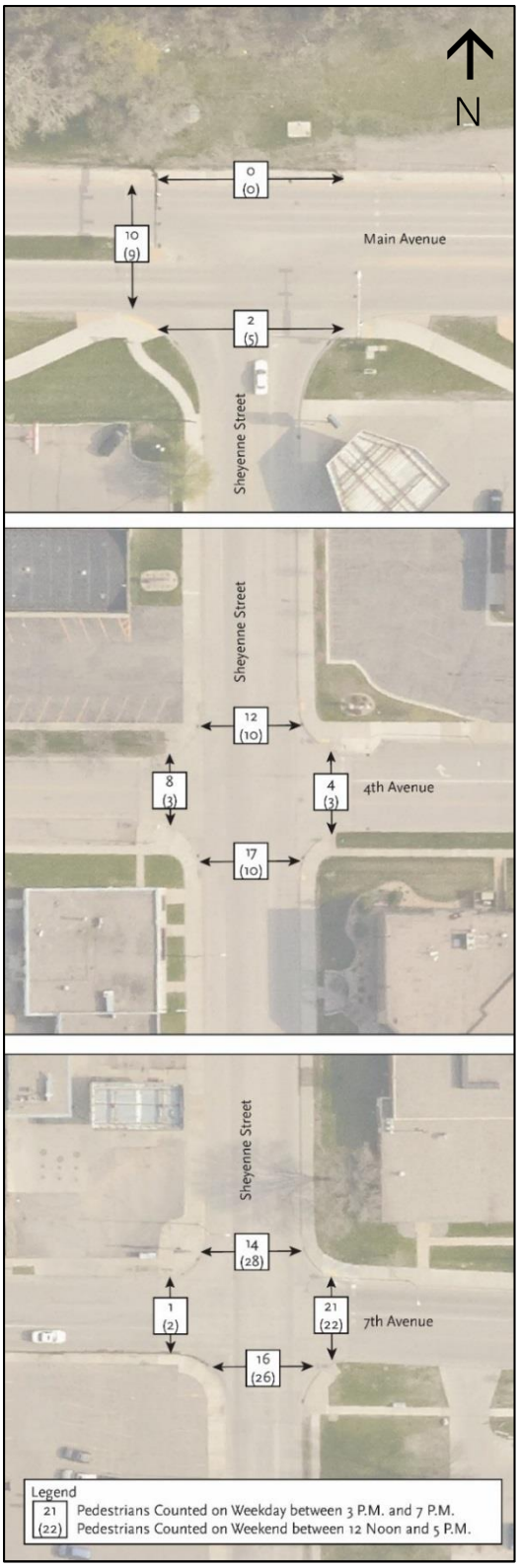
Metro COG and its member local units of government approved the Fargo-Moorhead Metropolitan Area Complete Streets Policy Statement (2010). This report is designed to follow that guidance.

Pedestrian and Bicycle Generators

Pedestrian and bicycle generators are types of land uses or attractions that people are inclined to walk or bike to access like a school, park, coffee shop or restaurant, etc. The Sheyenne River, Armour Park, Citizens Park, Herb Tintes Park, Veterans Memorial Pool, South Elementary School, the bus stop, any of the many churches, gas stations, and restaurants on the corridor all encourage pedestrian and bicycle traffic.

Providing safe and efficient access to these generators can improve connectivity and encourage people to walk or bike to these generators. In the Sheyenne Street and Main Avenue Framework Study, a trail and pedestrian bridge was recommended to connect the Sheyenne Street corridor to Armour Park north of Main Avenue. Additionally, it recommended a pedestrian bridge at 2nd Avenue to connect west

FIGURE III-15: PEDESTRIAN COUNTS ON A WEEKDAY EVENING AND WEEKEND AFTERNOON



of the river to downtown. All other locations have sidewalks connecting them to Sheyenne Street and the surrounding neighborhoods.

Currently, pedestrian volumes are relatively low for a downtown area. Redevelopment and improved pedestrian facilities have the potential to drastically change these volumes.

Pedestrian Amenities

Current City of West Fargo ordinances require sidewalks on both sides of the roadway built no less than four feet in width in residential areas and six feet in width in commercial areas. Sidewalks of varying widths are present throughout the study corridor on both sides of Sheyenne Street. Using HCM methodology, pedestrian LOS for Sheyenne Street between Main Avenue and 13th Avenue is LOS "C". Pedestrian LOS is based on user perception, incorporating vehicular traffic characteristics like speed, volumes, barriers between the roadway and sidewalk and sidewalk width.

Americans with Disabilities Act Compliance

The Americans with Disabilities Act (ADA) provides design standards for pedestrian paths and curb ramps in the 2010 ADA Standards for Accessible Design. The basic requirements address width and condition, surfaces, curb ramps and flares, location and placement of pedestrian push buttons, and slopes for pedestrian paths and curb ramps.

Beyond the federal law that requires ADA compliance, meeting the standards improves accessibility and comfort for all users. A full evaluation of ADA compliance is outside the scope of this study. However, during the field review, multiple locations were noted with narrow sidewalks (left), missing curb ramps (middle), broken curb ramps or missing detectable warning panels (top right) and broken sidewalk (bottom right). Narrow sidewalks, missing curb ramps and steep slopes could prevent a person in a wheelchair from traveling a sidewalk safely and easily. Detectable warning panels indicate to visually impaired pedestrians that a potential conflict area is approaching. Broken sidewalk is dangerous to blind pedestrians and can make traversing the sidewalk difficult for pedestrians in a wheelchair.

FIGURE III-16: ADA DEFICIENCIES ALONG SHEYENNE STREET

Crossing Locations

FIGURE III-17: MARKED CROSSING WITH PEDESTRIAN CROSSING SIGN

There are two signalized intersections on the corridor, one at Main Avenue and another at 13th Avenue. Both of these intersections feature pedestrian push buttons and painted crosswalks. Most of the other crosswalks have recently been repainted at other intersections throughout the corridor; marked crosswalks across Sheyenne Street can be found at:

- 2nd Avenue (uncontrolled on Sheyenne Street)
- 4th Avenue (uncontrolled on Sheyenne Street)
- 6th Avenue (uncontrolled on Sheyenne Street)
- 7th Avenue (all-way stop controlled)

Marked crosswalks alone do not improve pedestrian safety. They should be used with other safety strategies like pedestrian refuge islands, curb extensions and appropriate signage. Crossing improvements will be evaluated in subsequent chapters in the report.

Throughout this corridor there is a half-mile between each protected crossings. Research has shown pedestrians are unlikely to walk longer distances to use a protected crossing and will choose a more convenient crossing, even if it is less safe. As both pedestrian and vehicular traffic increase, conflict potential will also increase. Thus, it is important to include frequent controlled pedestrian crossings in highly traveled pedestrian corridors.

Signage

FIGURE III-18: PEDESTRIAN CROSSING SIGN MID-BLOCK

Guidance provided in the 2009 *Manual on Uniform Traffic Control Devices* (MUTCD) states that "regulatory and warning signs should be used conservatively because these signs, if used to excess, tend to lose their effectiveness. If used, route signs and directional guide signs should be used frequently because their use promotes efficient operations by keeping road users informed of their location". Along the Sheyenne Street corridor, pedestrian warning signs are used frequently despite the low number of pedestrians crossing the roadway.

FIGURE III-19: SIGN CLUTTER

A high density of signing may lead to information overload. This occurs when too many sources of information compete for the driver's attention, leading drivers to overlook key information. Many locations along Sheyenne Street have regulatory signs and conflicting guide signs making it difficult to process all information.

The MUTCD also provides that traffic control devices, overhead sign supports and post-mounted sign and object marker supports should not be placed in the usable width of the sidewalk. Sign supports and lighting standards are frequently found in sidewalks along Sheyenne Street. This makes passage in a wheelchair difficult or impossible.

Effective Width

Research presented in the HCM found that pedestrians generally keep 18 inches between themselves and adjacent walls, curbs and other obstructions. Effective width is determined by subtracting 18 inches next to walls and curbs and 12 inches next to all other obstructions from the total width.

FIGURE III-20: SIDEWALKS NEAR MAIN AVENUE (LEFT) AND 8TH AVENUE (RIGHT)

Between Main Avenue and 7th Avenue, there are no boulevards between the sidewalk and roadway and light and sign posts are placed on the sidewalk. This leaves many locations with an effective width less than the six foot standard set forth in the ordinances. For example, south of 5th Avenue in the Berg Auto Supply parking lot, a railing separates the parking lot from the sidewalk. There is also a light pole placed on the sidewalk. The effective width at this location is four feet.

Between 7th Avenue and 13th Avenue, there are grassy boulevards between the sidewalk and roadway. Sign and light poles are typically placed within the boulevard. The effective width in this section is comparable to the actual width.

Bicycles

Within a commercial area, bicyclists are prohibited from using the sidewalk according to West Fargo ordinances; in residential areas no person 12 years of age or older are permitted to use the sidewalk unless those delivering newspapers, riding with a child under 12. Video data collected for this study indicated that most bicyclists use the sidewalk. This could be attributable to the lack of on-street bicycle facilities and heavy truck traffic. The provision of shared-use paths or marked bicycle lanes or shared lanes may reduce bicyclists' use of the sidewalk. Using HCM methodology, bicycle LOS for Sheyenne Street between Main Avenue and 13th Avenue is LOS "F". Bicycle LOS includes volume and speed of traffic, heavy vehicle percentage, pavement condition, presence of bike lanes and on street parking.

Transit

West Fargo is served by Metro Area Transit (MAT). Currently, 23 fixed routes serve the metro area. Downtown West Fargo is served by Route 16, an hourly service, with one marked stop with a bench at the West Fargo High Rise on 7th Avenue. This route does not run on Sheyenne Street.

In West Fargo, where auto-ownership rates are very high and congestion is reasonable, transit predominantly serves a social service function. Riders are often physically or economically unable to travel by private auto. As congestion begins to build metro-wide, transit will increasingly offer an alternative to the single occupancy vehicle, while also spurring pedestrian and bicycle activity

FIGURE III-21: ROUTE 16 BUS STOP AT WEST FARGO HIGH RISE

Research points to a direct correlation between transit demand and residential and employment density measured in units per acre. Specifically, a minimum of seven dwelling units per acre or 25 jobs per acre is required to support a fixed-route hourly transit system. Evaluating areas that meet this threshold will be used to identify areas that may benefit from new or increased transit service. 2010 Census Block data was used to determine densities at the block level. More than 80 percent of areas along the corridor with residential densities of seven per acre or higher are within one-quarter mile of the existing Route 16. MAT does not require a passenger to be at a designated bus stop, but will stop at any corner along the route to pick up a rider.

North of 4th Avenue, west of Sheyenne Street and north of 2nd Avenue east of Sheyenne Street are more than one-quarter mile from the existing Route 16. While this area is primarily commercial, it is not adequately serviced by transit. Improved transit could help support redevelopment of the corridor.

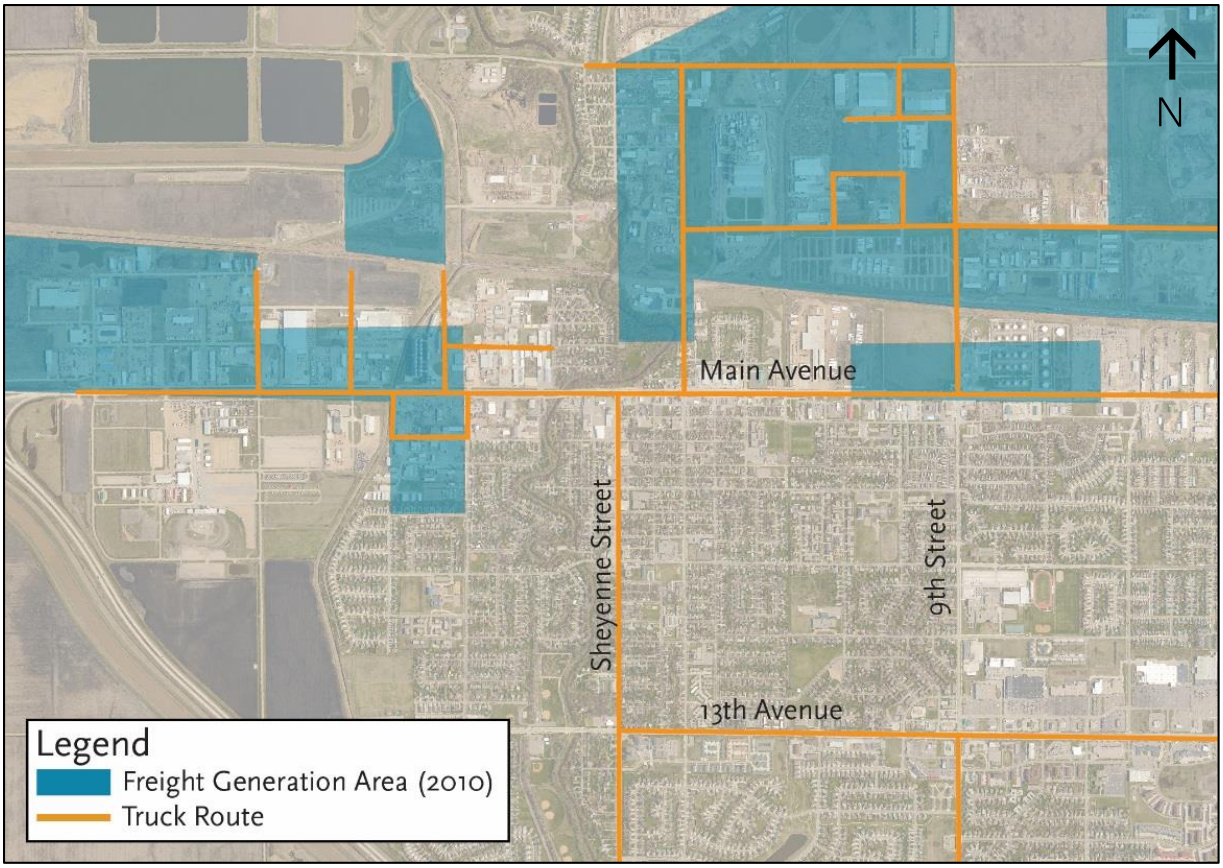
Using HCM methodology, transit LOS for Sheyenne Street between Main Avenue and 13th Avenue is LOS "E". Transit LOS incorporates accessibility, bus frequency and bus travel time.

FIGURE III-22: TRANSIT-SUPPORTIVE RESIDENTIAL DENSITY AROUND SHEYENNE STREET

Freight Generation

Most of West Fargo's industrial properties, including the Butler Industrial Park, Strata Corporation and other fabrication and manufacturing companies, are north of Main Avenue. Sheyenne Street is a dedicated truck route in the metro area; businesses that support the home construction business use Sheyenne Street to access the major growth areas of south West Fargo and Fargo. Through the public input process, more information will be collected regarding origins and destinations. Truck traffic as a percentage of total track and daily distributions can be found in the Traffic Volumes section beginning on Page III-6.

FIGURE III-23: FREIGHT GENERATION AND TRUCK ROUTES



Parking

The right balance must be struck between not providing enough parking, which would deter individuals from patronizing existing and future businesses, and providing too much parking, which has negative environmental impacts through increased impervious surface and financial impacts by using space for parking instead of taxable developments.

Parking Supply

Parking is provided through private off-street parking provided by businesses as mandated by the West Fargo Municipal Code and on-street parking. There were 230 on-street parking spaces available throughout the study area with 820 off-street spaces available for 1,050 total spaces.

Parking supply north of 7th Avenue included off-street and on-street parking within one block east or one block west of Sheyenne Street. Almost three-quarters of on-street parking in the study area is north of 7th Avenue.

Parking supply south of 7th Avenue included only on-street parking on Sheyenne Street, provided on the west side of the roadway.

Parking Demand

Parking demand analysis was completed for six time periods on a weekday and four time periods on a Saturday. Data for weekday demand was combined into morning (8 A.M. and 10 A.M.), afternoon (12 Noon and 3 P.M.) and evening (5 P.M. and 7 P.M.) and data for weekend demand was combined into afternoon (12 Noon and 3 P.M.) and evening (6 P.M. and 9 P.M.). Because parking demand can change drastically from season to season and lack of striping in most parking lots and off-street parking reduce the efficiency of the space, any demand that met or exceeded 75 percent of total available parking supply was considered approaching capacity. Any demand that met or exceeded 90 percent of total available parking supply was considered at capacity.

Weekday Parking Demand

The following was observed for weekday parking demand:

- During the weekday morning period, no average parking demand approached or exceeded capacity. On average, there were more than 800 parking spots available throughout the morning
- During the weekday afternoon period, only two lots had an average parking demand that approached or exceeded capacity, one near the Petro Serve U.S.A. and the other near West Side Hair and Dasch's Duds. On average, there were more than 775 parking spots available throughout the afternoon.
- During the weekday evening period, only the West Side Hair/Dasch's Duds lot had an average parking demand that approached capacity. On average, there were more than 850 parking spots available throughout the evening.
- No on-street parking demand on Sheyenne Street ever exceeded 30 percent. Multiple side street locations north of 7th Avenue with on-street parking frequently exceeded 60 percent demand for at least one study hour.

TABLE III-4: WEEKDAY PARKING DEMAND BY STUDY PERIOD

	On-Street Parking Demand South Of 7th Avenue	On-Street Parking Demand North Of 7th Avenue	Off-Street Parking Demand North Of 7th Avenue
8 A.M.	3.0%	21.0%	22.0%
10 A.M.	10.6%	21.0%	27.1%
12 Noon	6.1%	21.6%	31.6%
3 P.M.	4.6%	12.0%	25.0%
5 P.M.	1.5%	17.4%	20.3%
7 P.M.	1.5%	19.2%	22.1%

Weekend Parking Demand

The following was observed for weekend parking demand:

- During the afternoon period, only the VFW parking lot had an average parking demand that approached or exceeded capacity. On average, there were more than 875 parking spots available throughout the afternoon.
- During the evening period, the on-street parking at 4th Avenue and the Sooper Stop parking lot had parking demand that approached capacity. On average, there were more than 875 parking spots available throughout the evening.

TABLE III-5: WEEKEND PARKING DEMAND BY STUDY PERIOD

	On-Street Parking Demand South Of 7th Avenue	On-Street Parking Demand North Of 7th Avenue	Off-Street Parking Demand North Of 7th Avenue
12 Noon	6.1%	22.8%	23.9%
3 P.M.	7.6%	16.8%	10.3%
6 P.M.	3.0%	25.8%	21.8%
9 P.M.	0.0%	19.2%	15.0%

Parking Demand Summary

At any point of the day, whether weekday or weekend, drivers are likely to find a parking surplus at any location along the corridor. Even during the noon hour, the study hour with the heaviest parking demand, 760 spaces were still available. This suggests that current parking requirements may be too high. Opportunities to consolidate or share parking will be evaluated later in this report.

FIGURE III-24: TOTAL ON- AND OFF-STREET PARKING SUPPLY

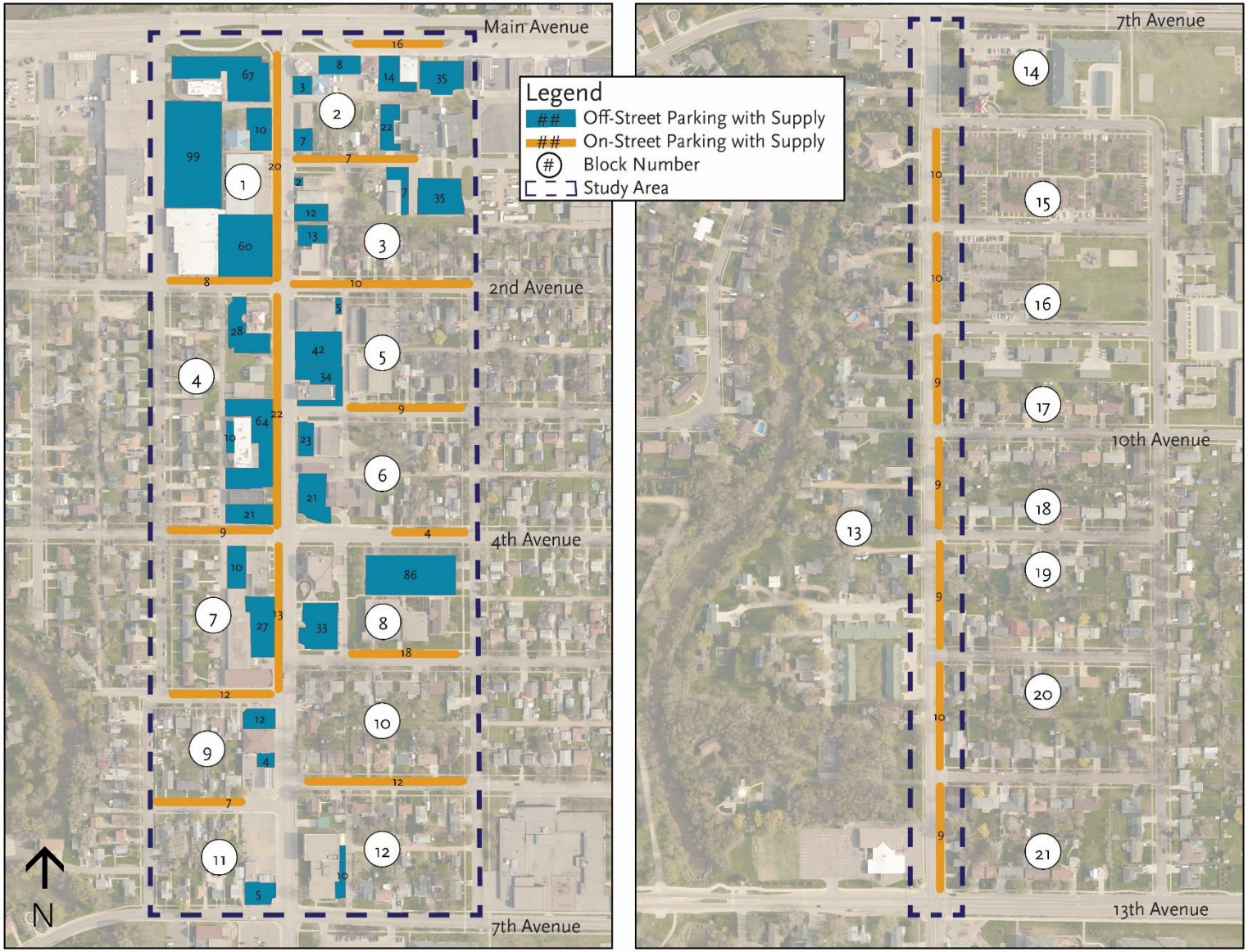


FIGURE III-25: AVERAGE PARKING DEMAND FOR WEEKDAY MORNING

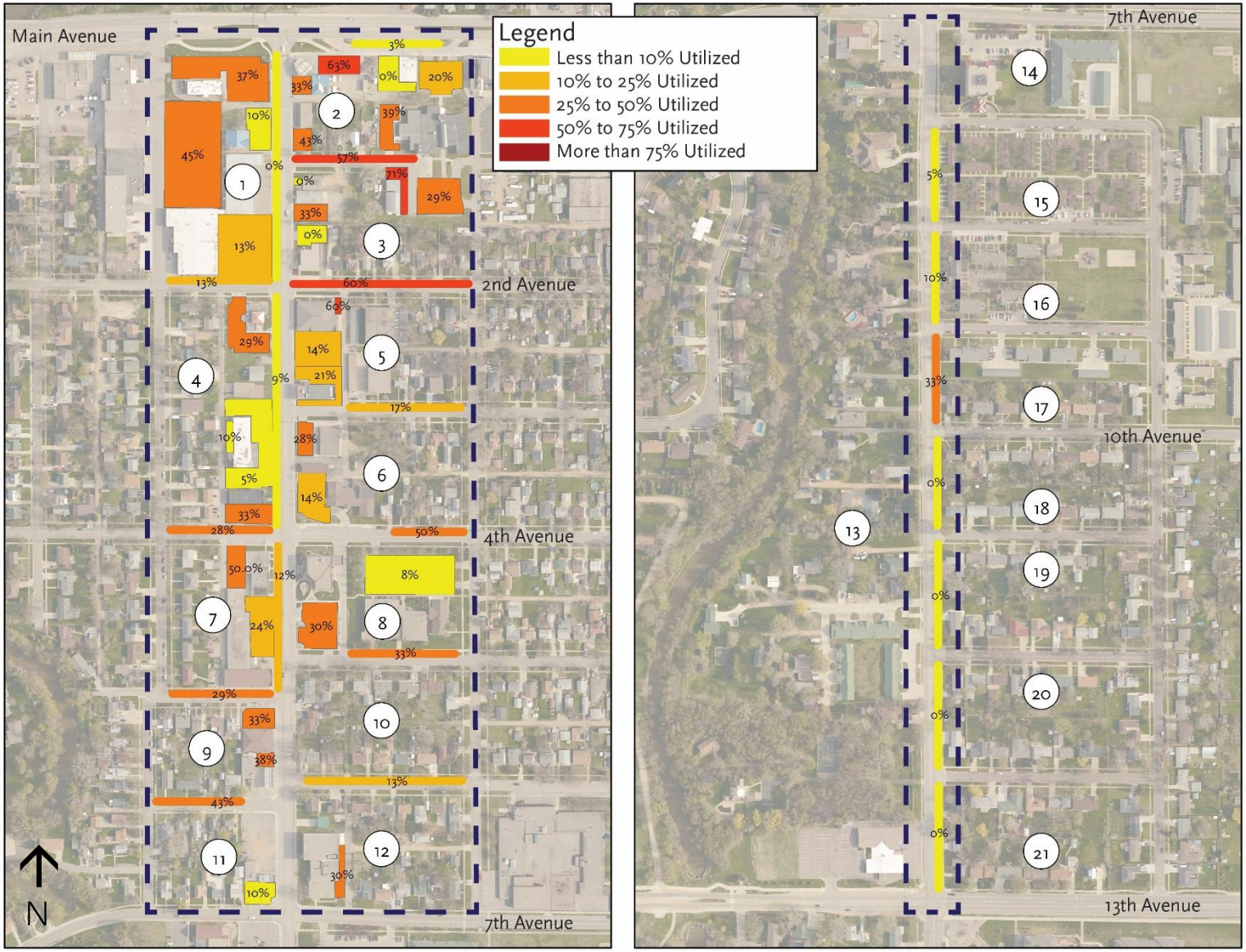


FIGURE III-26: AVERAGE PARKING DEMAND FOR WEEKDAY AFTERNOON

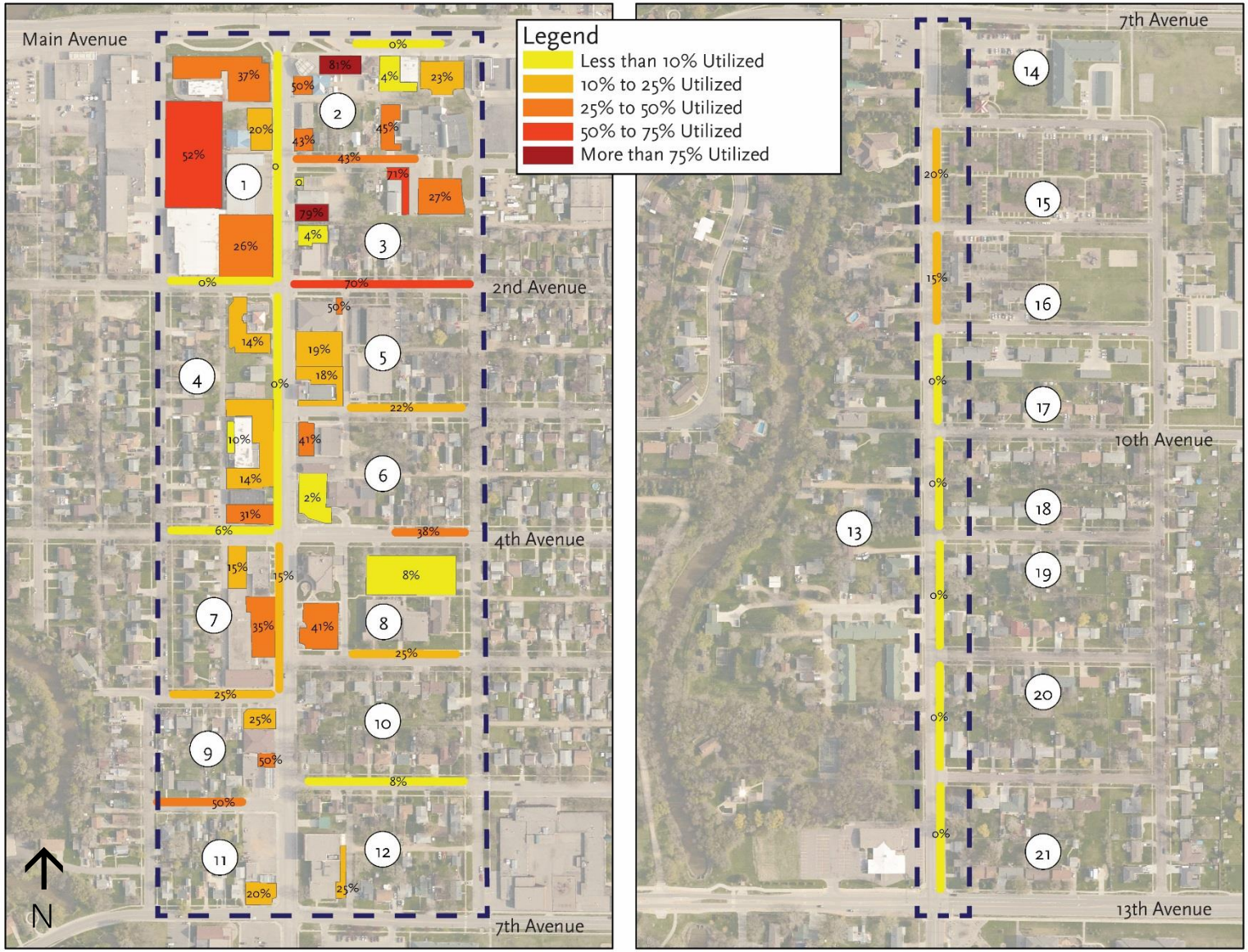


FIGURE III-27: AVERAGE PARKING DEMAND FOR WEEKDAY EVENING

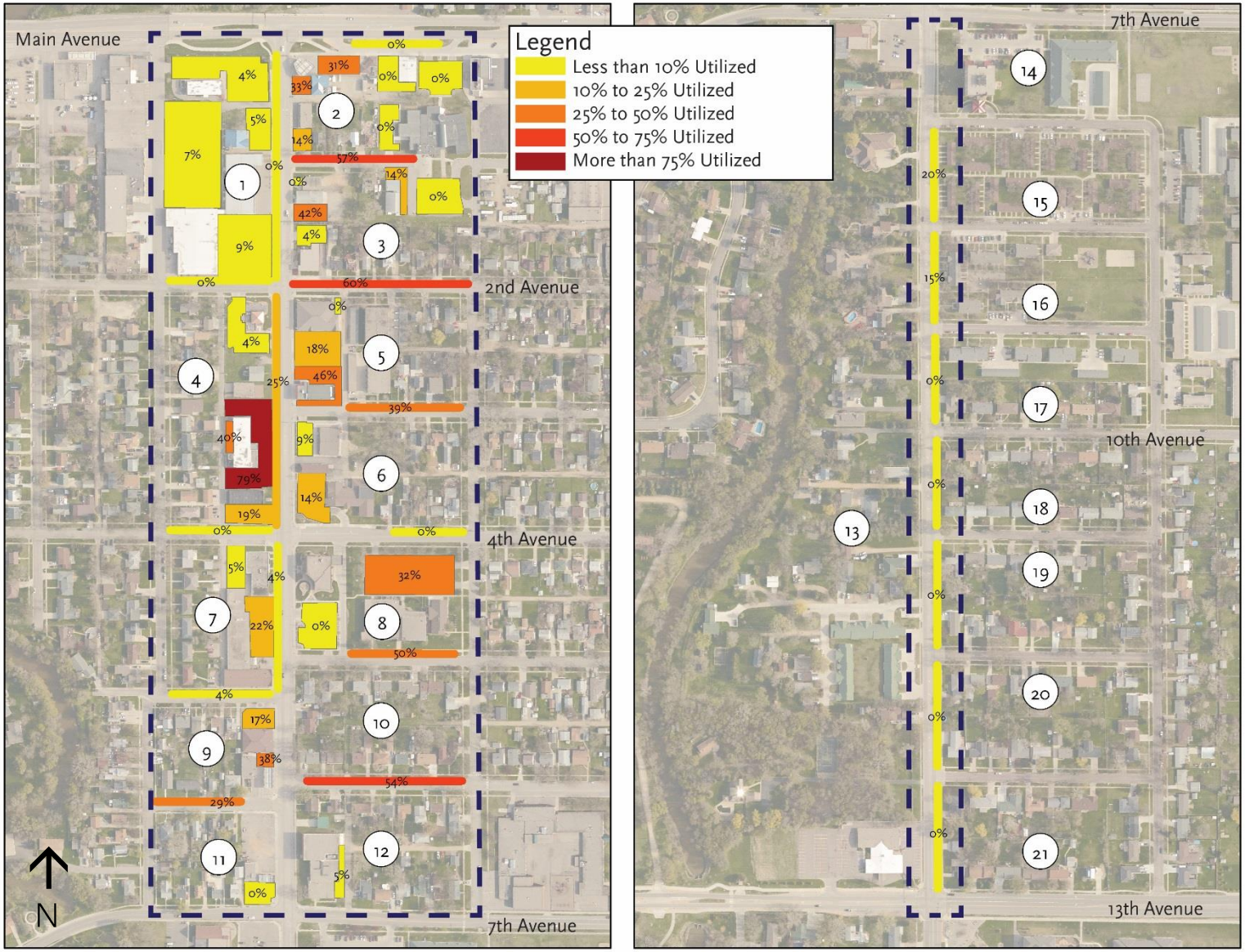


FIGURE III-28: AVERAGE PARKING DEMAND FOR A WEEKEND AFTERNOON

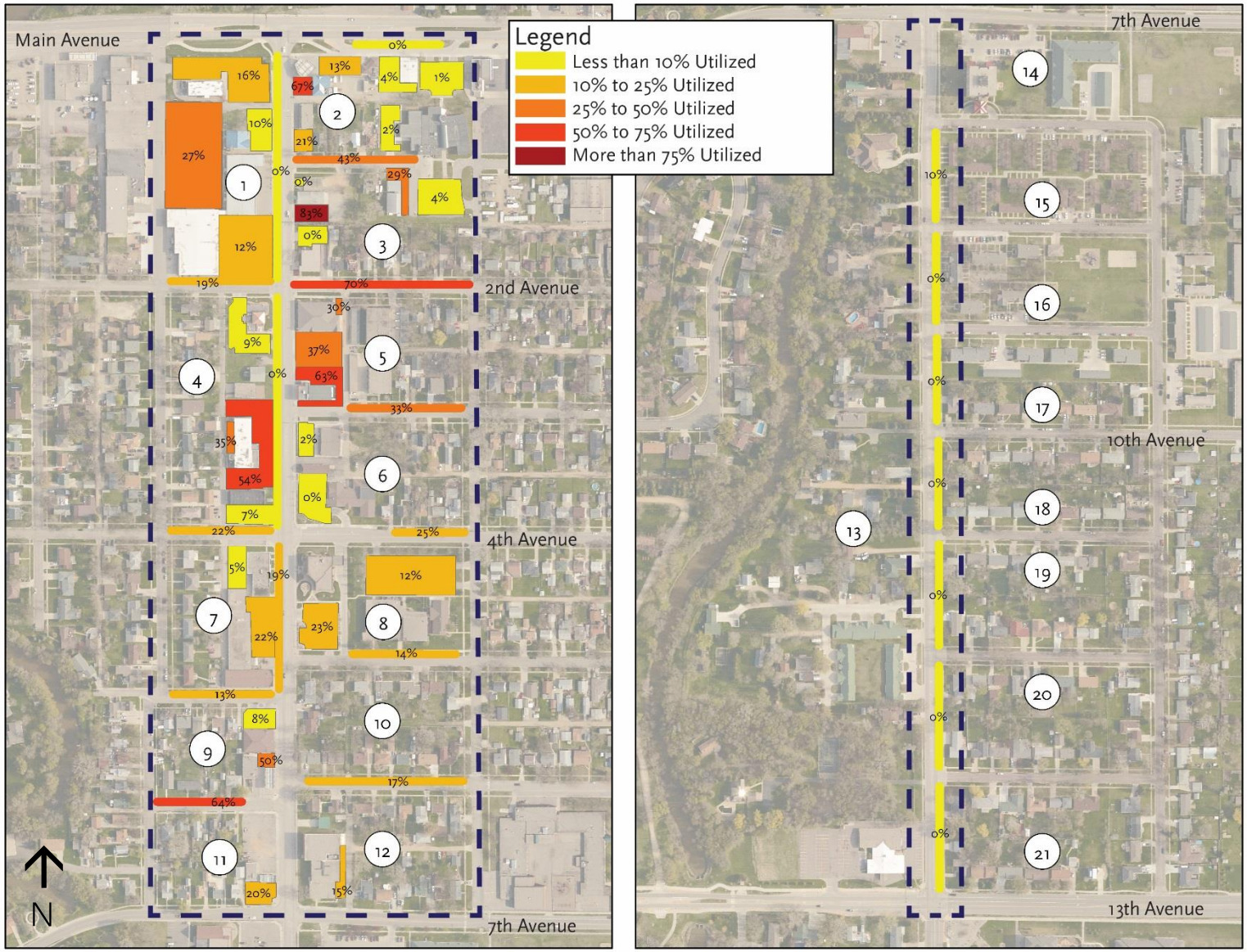
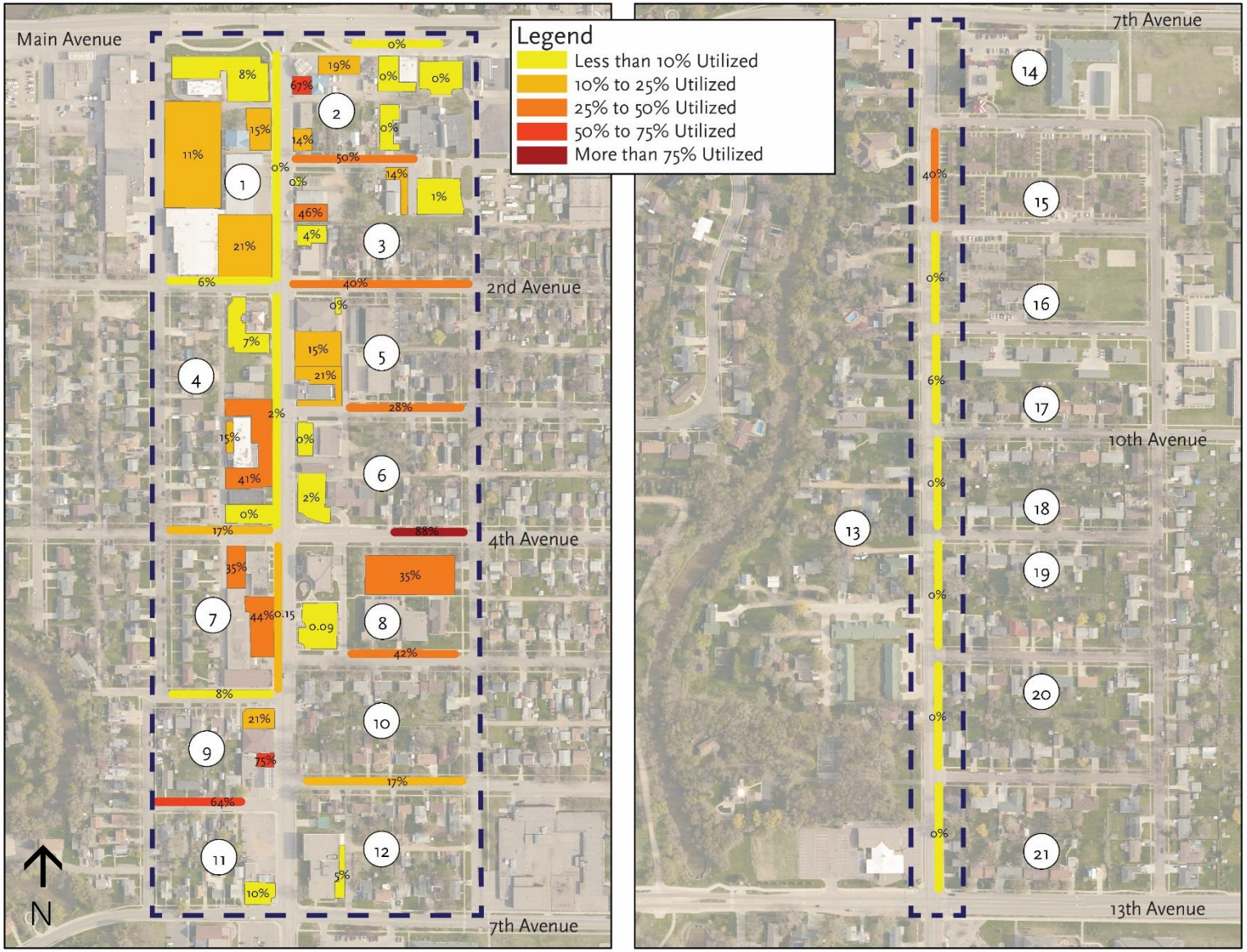


FIGURE III-29: AVERAGE PARKING DEMAND FOR A WEEKEND EVENING



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, operational and aesthetic deficiencies:

- According to *NCHRP Report 420: Impact of Access Management Techniques*, every unsignalized driveway increases the corridor crash rate by approximately two percent.
- Research included in the *Highway Capacity Manual* found that roadway speeds were reduced an average of 2.5 miles per hours for every ten access points per mile.
- The safety and operational issues caused by dense access spacing potentially makes an area less attractive to developers and the general traveling public. Multiple national studies have shown most people have no problem making a slightly longer trip, including U-turns, to access destination businesses so long as the ride is pleasant and congestion free.

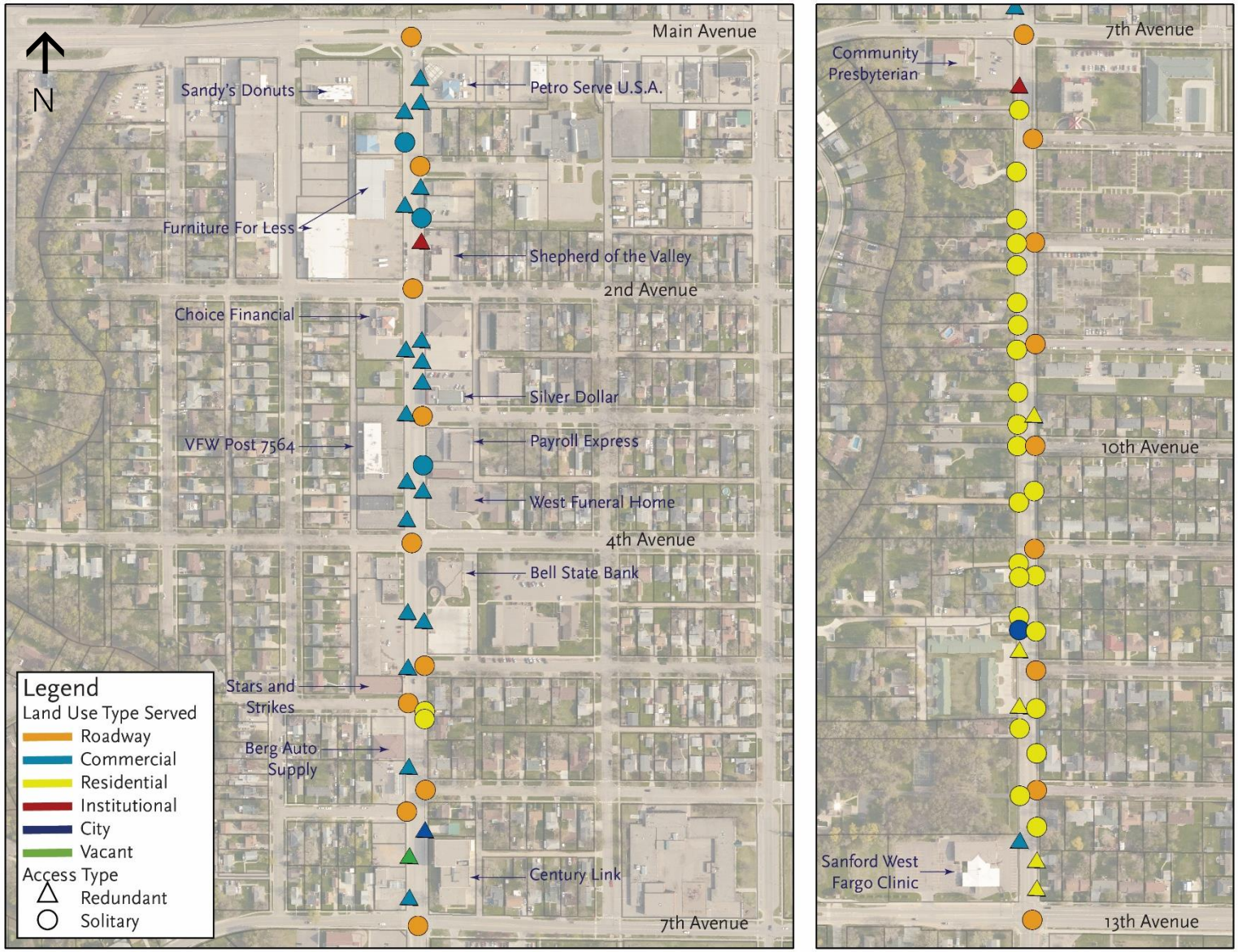
According to access management guidelines outline in the City of West Fargo Municipal Code, desired access spacing on urban arterials is 660 feet with 330 feet being the minimum acceptable spacing in developed areas. Within this mile-long study area, there are more than 70 access points including private residential and business driveways and local roadways.

TABLE III-6: ACCESS SPACING

Segment	Access Points[1]	Allowable Access Points Per Minimum Spacing[2]	Percent Over Allowable Access Points
Main Avenue To 2nd Avenue	10	3	333.3%
2nd Avenue To 4th Avenue	11	3	366.7%
4th Avenue To 7th Avenue	15	4	375.0%
7th Avenue To 10th Avenue	16	4	400.0%
10th Avenue To 13th Avenue	19	4	475.0%

[1]access Points Include Termini. Counts Aligned Access Points As One Access.
[2]based On 330 Foot Minimum In City Of West Fargo Access Spacing Guidelines.

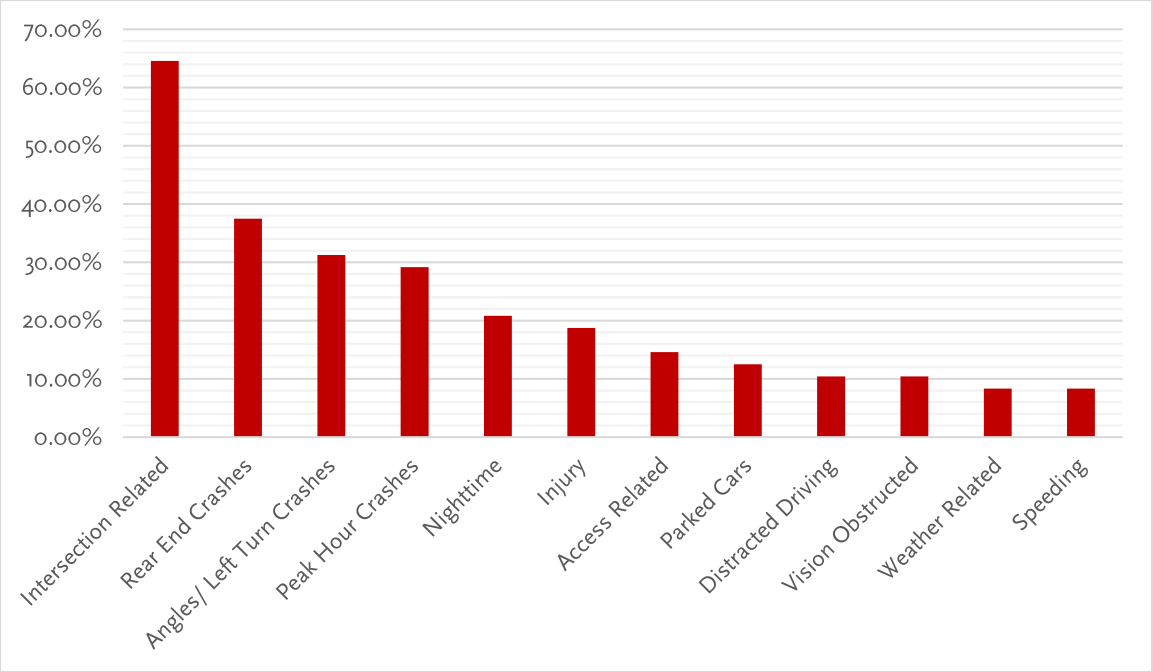
FIGURE III-30: ACCESS POINTS ALONG STUDY AREA



Crash History

Safety is of utmost importance when evaluating a corridor; reviewing historic crash information is vital to identifying deficiencies. Three years of crash records (July 1, 2012 to June 30, 2015) obtained from NDDOT shows sixteen crashes per year in the study area. This includes three crashes per year resulting in an injury (includes the possible injury classification). The National Safety Council (NSC) estimates the economic impact of crashes based on wage and productivity losses, medical and administrative expenses, motor vehicle damage and employer costs due to injuries. Based on this data, the total costs associated with crashes in the study area was $162,000 annually. Upon further review of the crash data, the following crash trends were identified:

FIGURE III-31: CRASH TRENDS

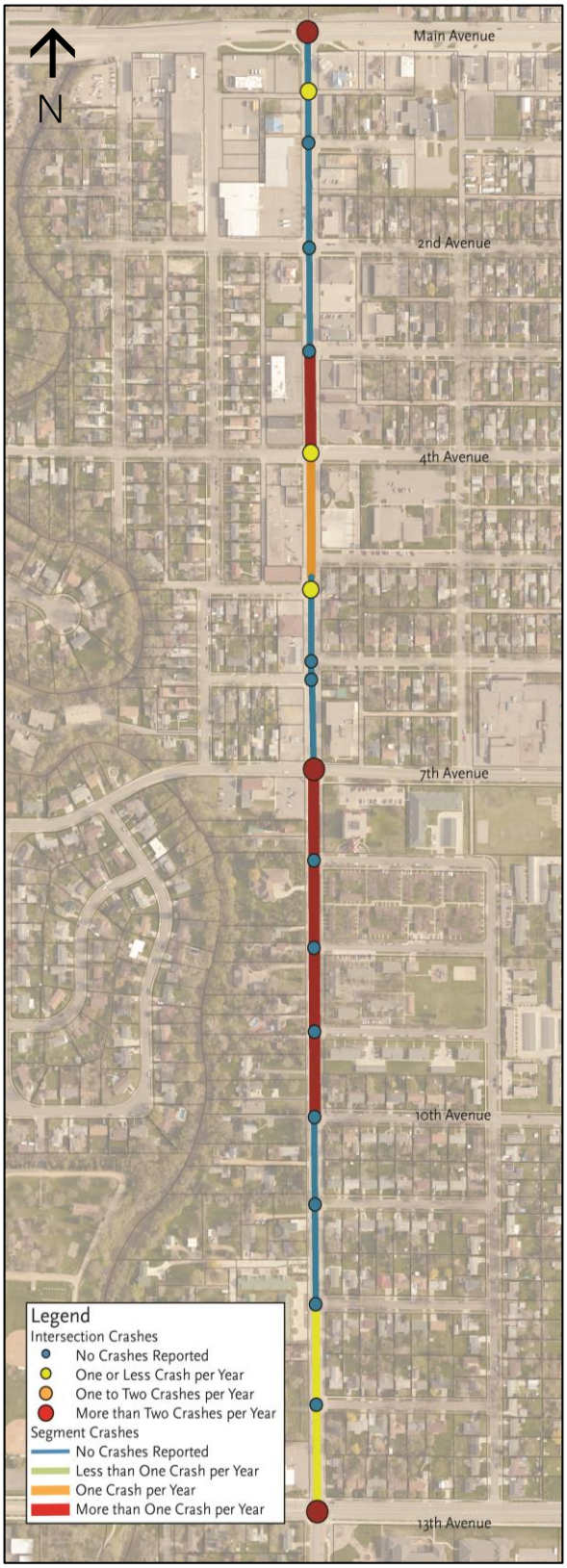


Nearly 80 percent of all crashes in the study area are intersection or access related. Poor operations, unwarranted traffic control and densely spaced access points can contribute to this trend. Nearly 30 percent of crashes occur during the A.M. or P.M. peak hour despite the peak hours carrying less than 20 percent of daily traffic, combined. On-street parking contributed nearly 23 percent of all crashes as vehicles were parked to close to intersections obscuring sight lines or drivers entering or exiting on-street parking collided with mainstream traffic.

Crash Hotspots

To identify overrepresented crash locations within the study area, a two-phase approach was adopted. First, crash frequency was studied to identify locations with the highest number of crashes. This is the most straightforward approach to determining locations susceptible to crashes. Crash frequency can be found in Figure III-32.

FIGURE III-32: CRASH FREQUENCY



Crash frequency ignores the rate at which crashes occur. Typically, intersections with a high number of crashes also carry high traffic volumes. Many times a low volume intersection may have fewer overall crashes, but on a per car basis have a much higher susceptibility to crashes. Therefore, it is beneficial to identify which locations in the study area experience a statistically high crash rate. To identify statistically significant crash rates, the critical crash rate method was used. This method was developed by the Minnesota Department of Transportation (MnDOT) and is included in the NDDOT Design Manual. The critical crash rate incorporates traffic volumes and crash rates for a particular location and compares this rate against crash rates for similar facilities. Given the small study area, intersections and links were compared against other study area intersections and links as well as statewide rates from Minnesota. North Dakota does not provide this data.

According to the critical crash analysis methodology, intersections with crash rates over the critical rate are considered overrepresented and in need of review because there is a high probability that conditions at the site are contributing to the higher crash rate. The following locations were deemed "overrepresented" according to this methodology:

- The Petro Serve U.S.A. driveway
- Sheyenne Street between 3rd and 4th Avenues
- The Sheyenne Street and 5th Street intersection
- The Sheyenne Street and 7th Avenue intersection

Trend Analysis

Once crash hotspots were identified using crash frequency and critical crash analysis, a detailed review of the crash reports from July 1, 2012 to June 30, 2015 was conducted. Improvement strategies will be developed and evaluated in subsequent chapters.

Sheyenne Street and Main Avenue

Seven crashes occurred at this intersection. Four of these crashes (57.1 percent) were rear-end type crashes during a red light. Crashes at this intersection did not show other similar characteristics like time of day, direction or contributing factors. Rear-end crashes are prevalent at signalized intersections.

This intersection was not identified as an overrepresented crash location, meaning crash patterns appear to be normal at this location. This trend will be considered when developing alternatives.

Access Related Crashes

Seven of the eight crashes from Main Avenue to 4th Avenue were access related. The Petro Serve U.S.A. driveway south of Main Avenue experienced two crashes. Both involved motorists attempting to leave the gas station that could not see conflicting traffic, likely due to northbound queues. Five additional crashes occurred at other access points between Main Avenue and 4th Avenue.

Sheyenne Street and 7th Avenue

Eleven crashes occurred at this intersection; 36.4 percent were southbound vehicles failing to stop resulting in angle crashes. After time, motorists may begin to disregard all-way stop control if there rarely conflicting traffic, especially during off-peak hours. Field reviews indicated that most people treat this intersection as a yield when there is no conflicting traffic.

Two additional rear-end type crashes were related to long queues during peak hours at this intersection. Queues extend beyond the adjacent intersections and oncoming vehicles have not prepared to stop.

These crash trends indicate the all-way stop control may be inappropriate at this location. Improvement strategies will be evaluated later in the report.

Sheyenne Street and 13th Avenue

Seven of eleven crashes at this intersection (63.6 percent) were rear-ends. Four of these rear-ends occurred during the peak hours. Poor operations, especially during peak hours, leading to long queues and delays interfere with motorist expectancy. As improvements are made south of 13th Avenue, it is likely operations will improve at this intersection, possibly reducing crash potential.

On-Street Parking Related Crashes

There were six crashes on Sheyenne Street related to on-street parking. Four of these crashes occurred in the evening or early morning while dark. Two crashes occurred when parked vehicles tried to enter the traffic stream and were hit by through vehicles. Between 3rd Avenue and 4th Avenue, there were two parking related crashes, one where a vehicle was parked too close to the intersection and a turning vehicle hit the parked car and another when a distracted driver hit a parked car. It is likely that bulb outs or parking restrictions on distance from intersections could mitigate these types of parking related crashes.

Traffic Control

Appropriate traffic control is essential for efficient traffic operations and crash mitigation. Selecting the appropriate traffic control device requires consideration of traffic patterns, volumes, roadway geometry and lane configurations. The MUTCD provides guidance and standards on the installation of traffic control methods. The guidance and standards consider vehicular volume, pedestrian volume and crash frequency thresholds for multiple roadway contexts. The following is a summary of the traffic control analysis under existing conditions:

- No intersections with two-way stop control meet all-way stop control or traffic control signal warrants.
- All local streets meet two-way stop control warrants and have stop control on the minor street approaches.
- The intersection at 7th Avenue meets the all-way stop control warrants given the entering vehicular volume. However, all-way stop control may be contributing to the rear-end crash and angled crash trends seen at and near this intersection as well as poor operations. Alternative intersection control, like roundabouts, can provide an aesthetically pleasing option that would mitigate rear-end crash potential, eliminate angled crashes and improve operations. Intersection designs will be studied later in this report.
- Only existing signalized intersections meet all-way stop control warrants, where it will reduce operations. No additional all-way stop control is recommended for the corridor.
- Both intersections under traffic control signals meet signal warrants.
    - » While right-turns are typically excluded when doing a warrant analysis, the traffic signal at Main Avenue is only warranted if right-turns are included. Given expected traffic growth along Main

Avenue and the significant right turning movements, it is not recommended to remove the traffic control signal.

  - » The 13th Avenue intersection meets the eight-hour volume warrant without right-turns.
- No other intersections along the corridor meet traffic control signal warrants.

FIGURE III-33: TRAFFIC SIGNAL AT MAIN AVENUE

Special Events

Downtown West Fargo is home to many special events in the spring, summer and fall months. Four times a year, Toppers Car Club hosts West Fargo Cruise Night where classic cars line the streets from Main Avenue to 7th Avenue. This event regularly attracts nearly 1,000 attendees either showcasing cars, "cruising" Sheyenne Street or just partaking in the evening's activities. During the event, the roadway is converted to angle parking with the northbound and southbound lanes narrowed and shifted east.

FIGURE III-34: WEST FARGO CRUISE NIGHT

The study team met with Toppers Car Club to discuss needs and potential conflicts from roadway revisions. Upon completion of the discussion it was determined that the temporary needs of the car show differed from the needs of normal operations. Specifically, a few items the club valued:

- Lack of traffic control between Main and 7th Avenues allows for unimpeded "cruising" of the corridor.
- Ample parking is conducive to a successful event. More parking may actually allow the event to grow, although not a current goal of the club.
- Open parking lots provides areas for tents, car storage and food vendors.

A free flowing corridor with excess parking may contradict competing goals to spur development and allow frequent pedestrian crossings. Toppers Car Club members agreed that, barring any dramatic changes, the event could adapt to roadway revisions. Temporary operations of the corridor can also vary from normal operations (i.e. revised parking, traffic control, etc.) for these types of events.

West Fest is typically held in September together with Cruise Night, a parade and other activities that bring thousands to Sheyenne Street. The parade involves a complete shutdown of Sheyenne Street to normal traffic and allowing southbound only movement for parade floats.

FIGURE III-35: WEST FEST PARADE

Although these events in total are only five days of the year or one percent, it is important that roadway improvements are conducive to these events. These special events bring attention and life to downtown West Fargo and are critical to the continued success of the downtown.

IV) Future Conditions Analysis

In the Sheyenne Street/Main Avenue Framework Study, the City of West Fargo studied a variety of strategies to support private redevelopment. This study identified potential locations that are prime for redevelopment, based on parcels with an improved value less than the land value, and what that redevelopment might look like.

FIGURE IV-1: AREAS IDENTIFIED AS LIKELY TO CHANGE FROM THE SHEYENNE STREET/MAIN AVENUE FRAMEWORK STUDY

Using this analysis and discussions the City of West Fargo Economic Development staff has had with downtown businesses, a tiered system of redevelopment potential was developed for downtown from Main Avenue to 7th Avenue, ranging from no redevelopment to high redevelopment.

Redevelopment is a major consideration because proposed redevelopment strategies include multi-story buildings with significantly greater traffic generation and parking demand, increasing the burden on the transportation system. No redevelopment is expected south of 7th Avenue; this area is fully developed with residential uses and is not anticipated for redevelopment within the 25 year study horizon.

Redevelopment Scenarios

Based on the analysis presented in the Sheyenne Street/ Main Avenue Framework Study, four redevelopment scenarios were developed and analyzed. Each scenario is detailed below. This approach does not specifically identify redevelopment locations for the Medium and High Redevelopment Scenarios, as this would require extensive public involvement for a topic not within the scope of this project. The disadvantage of this approach is that opportunities for improvements at specific locations cannot be analyzed due to the ambiguity of the approach. Thus, as redevelopment occurs, additional studies may be required.

The purpose of this analysis is not to develop recommendations for redevelopment, rather this scenario analysis is designed to evaluate a range of potential outcomes on the downtown Sheyenne Street and implications to the surrounding transportation system. It is unlikely that downtown will look exactly like any of the three redevelopment scenarios but the purpose is to understand the thresholds for transportation improvement needs.

No Redevelopment

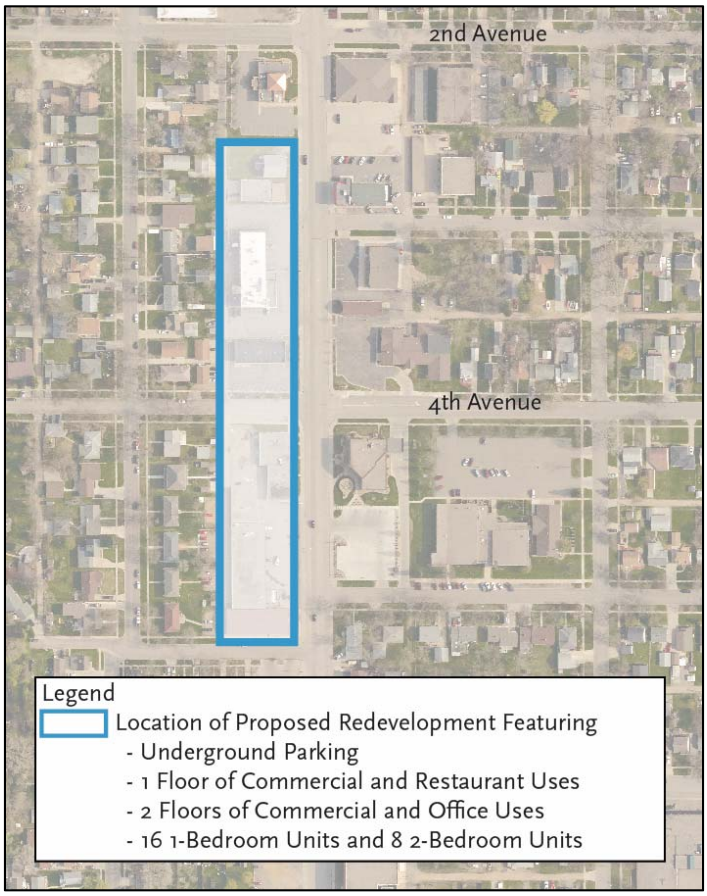
This scenario assumes no redevelopment of existing buildings. However, this scenario does include a detailed analysis of parking surplus to determine if there are any areas where parking can be removed in favor of developable land.

For this scenario, the study team developed a baseline model of parking and trip generation rates based on the Institute of Traffic Engineer's (ITE) *Trip Generation Manual* and *Parking Generation Manual*. The trip generation and parking models were calibrated to existing conditions. Details will be provided later in this chapter.

Low Redevelopment

Over the past year there have been discussions regarding the redevelopment of the west side of Sheyenne Street from approximately 3rd Avenue to 5th Avenue, absorbing many of the existing land uses into the new development. Figure IV-2 shows the preliminary location of the planned development and the preliminary first floor design. Preliminary layouts of this development would include the ground floor for retail and restaurant uses, the second floor for office space and three additional floors of residential. The residential space would utilize underground parking, while retail, office and restaurant uses would be provided on-site parking.

FIGURE IV-2: LOCATION OF POTENTIAL NEAR-TERM REDEVELOPMENT



This first of two buildings for this redevelopment project will likely be constructed in Summer 2016 with the second building completed in Summer/Fall 2017. The preliminary layout has evolved through this study and final design. The study team will not update this report as the layout changes, but will work with the developer to incorporate changes into the final improvement plan.

Layout changes included consolidating the two buildings into one and closing 4th Avenue to provide a park. Additional changes may include incorporating angled

parking on the south side of 4th Avenue. Additionally, the site layout may be altered to accommodate angled on-street parking in the front, or the west side of Sheyenne Street. Bulb outs at the intersections will protect vehicles parked on the street.

Parking needs for this scenario will be discussed later in this report.

Medium and High Redevelopment Scenarios

The Medium Redevelopment Scenario (30 to 40 percent of street facing properties) and High Redevelopment Scenario (50 to 60 percent of street facing properties) include the development identified in the Low Redevelopment Scenario, as well as additional parcels that are likely to redevelop as the character of the downtown changes. These scenarios will permit the study team to determine traffic generation and parking demand for the various redevelopment scenarios.

The purpose of this analysis is not to develop recommendations for redevelopment, rather this scenario analysis is designed to evaluate a range of potential outcomes on the downtown Sheyenne Street and implications to the surrounding transportation system. It is unlikely that downtown will look exactly like any of the redevelopment scenarios but the purpose is to understand the thresholds for transportation improvement needs.

The amount of redevelopment is estimated above. However, the specific redevelopment percentage is difficult to gauge due to the following uncertainties;

- Variability in land use types. Assumptions made on what the building will look like do not include the specific uses that will occupy those spaces. For example, even though contained within office uses, an architectural or engineering firm that requires large spaces for drafting and meetings would have drastically different impacts than a call center that only requires small spaces for employees. Alternatively, a fine dining restaurant services far fewer customers per hour than a sandwich shop or café.
- Transportation behavior. With improvements, different facilities and constraints will impact how people travel to and around the corridor. Improved bicycle and pedestrian facilities will encourage non-motorized trips to and through developments. Limited parking may make it difficult for people to re-park, encouraging them to walk between destinations along the corridor.
- Internal capture potential. As new activity is brought to downtown, it will become a destination and people will naturally link their trips, increasing internal capture rates. This will reduce the impact to the roadway.

Estimating Traffic Operations Impacts from Redevelopment

Trip Generation

Trip generation refers to the number of new trips that will be created by the redevelopment. It includes both incoming and outgoing vehicles. The following methodology was used to estimate new trips on the network:

- Existing and 2040 socioeconomic data from the Metro COG LRTP TDM was analyzed for the traffic analysis zone (TAZ) that contains Sheyenne Street between Main Avenue and 7th Avenue, the area for redevelopment.

TABLE IV-1: PROJECTED BASELINE JOB AND HOUSEHOLD GROWTH

	Jobs	Job Growth	Households	Household Growth
2010 Base Scenario	567		427	
2040 Base Scenario	667	100	427	0

- Assumptions for socioeconomic data for redevelopment were based on:

» Each new development would mimic the currently proposed redevelopment project with one floor of mixed retail and restaurant, one floor of office space and three floors of residential units.
» Each new building would be permitted to cover 20 percent of the parcel, with a building height of five floors, for a floor-area ratio of 1.0, similar to the proposed development.
» The average residential unit is 900 square feet.
» Employment density (square feet per employee) was estimated using building area per employee by business type, as provided by ITE.

Using these assumptions, additional jobs and households were added to the TAZ which contains Sheyenne Street between Main Avenue and 7th Avenue for each of the Low, Medium and High Redevelopment Scenarios. The TDM then estimated the new number of trips being added to the network.

TABLE IV-2: SOCIOECONOMIC DATA FOR REDEVELOPMENT SCENARIOS

Redevelopment Scenario	2040			
	Jobs	Additional Jobs	Households	Additional Households
No Redevelopment	567		427	
Low Redevelopment	667	100	487	60
Medium Redevelopment	790	223	610	183
High Redevelopment	965	398	685	258

Under the Low Redevelopment Scenario, 100 additional jobs are added and 60 households. Because specific information is known about the proposed redevelopment, the traffic generation for the development was further refined based on the following assumptions:

- All traffic into and out-of the development will likely use 4th Avenue. All traffic generation was applied to this intersection.
- For the A.M. peak hour, ITE trip generation rates were used. Because the development is mixed-use, internal capture rates from *NCHRP Report 684: Enhancing Internal Trip Capture for Mixed-Use Developments* were refined, based on engineering judgment and knowledge of local travel patterns, and applied, as shown in Table IV-3. Pass-by rates from the ITE *Trip Generation Manual* were applied to the reduced trip generation.

TABLE IV-3: A.M. PEAK HOUR INTERNAL CAPTURE RATES

Land Use Type	Entering Internal Capture	Exiting Internal Capture
Office	10%	10%
Retail	0%	0%
Restaurant	0%	0%
Residential	0%	10%

» It is expected that very few people who live in the building will also work in the office uses of the building. Furthermore, since the VFW will be the primary restaurant use and will not be open to the public during the morning peak hours and the types of retail likely to occupy this development, retail and restaurant uses were not expected to capture any trips.

- For the P.M. peak hour, ITE trip generation rates were also used. Again, internal capture rates from *NCHRP 684* were refined and applied to the trip generation rates (shown in Table IV-4); assumptions for internal capture rate reduction are shown below. Pass-by rates from the ITE *Trip Generation Manual* were applied to the reduced trip generation.

TABLE IV-4: P.M. PEAK HOUR INTERNAL CAPTURE RATES

Land Use Type	Entering Internal Capture	Exiting Internal Capture
Office	10%	20%
Retail	20%	20%
Restaurant	20%	20%
Residential	20%	20%

The increased internal capture rates highlight the increased activity expected during the PM peak hour as office workers frequent restaurants or retail before they drive home, residents do the same as they return from working outside the study area, etc. The specific calculations can be found in Appendix C.

The Medium Redevelopment Scenario will add an estimated 223 jobs and 183 new households over the No Growth Scenario. The High Redevelopment Scenario will add an estimated 398 jobs and 258 households over the No Growth Scenario. The refined trip generation from the Low Redevelopment Scenario was also added to the model outputs for the Medium Redevelopment and High Redevelopment scenarios.

Even under the High Redevelopment Scenario, the highest volume increase is less than 2,300 new vehicles per day. While this seems low compared to other areas with similar land uses, increasing land use diversity may keep some trips off the network. For example, if someone who lives on the corridor can now work and dine on the corridor, they may choose to walk from home to work to the restaurant and then back home, eliminating the use of Sheyenne Street for vehicle trips. This type of trip behavior is common in mixed-use developments such as this. It also highlights the need for pedestrian improvements.

Trip Distribution and Assignment

Using the TDM, the additional trips were then distributed across the metro-wide roadway network based on origins and destinations in all other TAZs. Finally, the TDM determined the routes that people will take based on their origins and destinations and travel times between the two and assigned the trip to the roadway network.

As congestion builds on Sheyenne Street, the model sought alternative routes. Under all scenarios, regional and through traffic was routed on 1st Street, instead of Sheyenne Street. As a local road providing access to schools, parks and churches, this roadway is not intended for high-speed through traffic. This traffic was manually rerouted onto Sheyenne Street for the purposes of the operations analysis presented in this report.

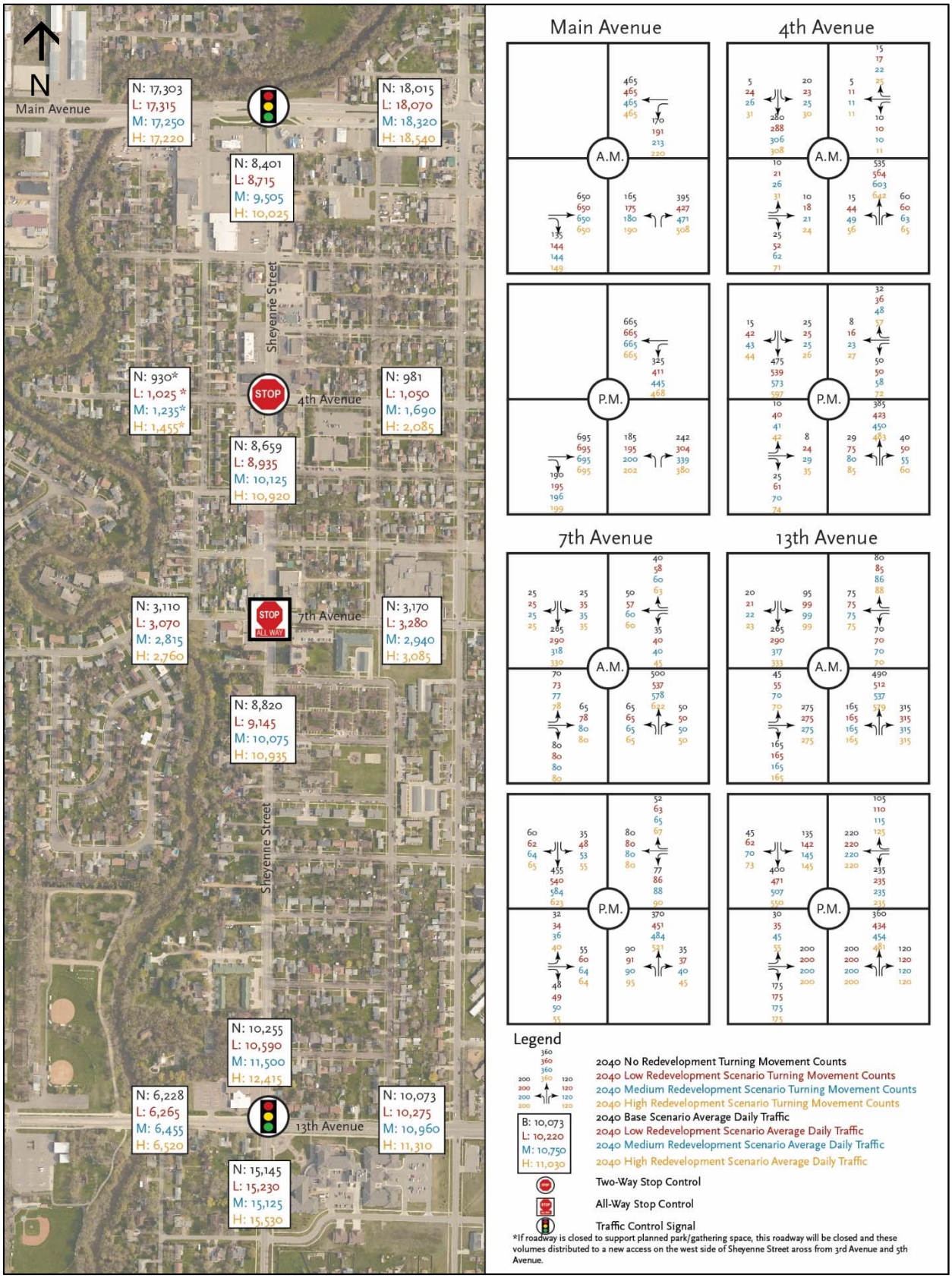
Practically, to discourage this type of routing, traffic calming measures on 1st Street may be necessary to slow vehicles, encouraging them to select a different route. Examples of traffic calming measures may include speed humps, bulb outs, medians and mini traffic circles. It is beyond the scope of this report to analyze and select alternatives for 1st Street; however, it is recommended the city study traffic calming measures along this roadway.

FIGURE IV-3: EXAMPLE TRAFFIC CALMING MEASURES

Using the model outputs for 2040 scenarios, future peak hour turning movements were estimated for study intersections using the collected turning movements at the four Sheyenne Street study intersections: Main Avenue, 4th Avenue, 7th Avenue and 13th Avenue.

The study team used an approach that follows *NCHRP 765: Analytical Travel Forecasting Approaches for Project Level Planning and Design* methodology. This involves using directional factors (D-Factors) and peak hour K-Factors and iteratively adjusting volumes until balanced. This was manually adjusted where appropriate, based on engineering judgment. Estimated ADTs and turning movements can be seen in

FIGURE IV-4: ESTIMATED ADTS AND TURNING MOVEMENTS FOR REDEVELOPMENT SCENARIOS



Traffic Operations for Redevelopment Scenarios

No Redevelopment Scenario Traffic Operations

Under the No Redevelopment Scenario, most of the corridor operates efficiently; the Sheyenne Street intersections at Main Avenue, 4th Avenue and 13th Avenue operate at LOS "C" or better for both A.M. and P.M. peaks. However, the intersection at 7th Avenue operates at LOS "F" during both A.M. and P.M. peak periods. During the A.M. peak period, it is estimated the northbound approach will experience an average per vehicle delay of more than one minute with queues that exceed 300 feet. At this length, 8th Avenue is blocked. During the P.M. peak period, it is estimated the southbound approach will experience an average per vehicle delay of more than two minutes with queues approaching 400 feet, blocking 6th Avenue East and 6th Avenue West as well as multiple driveways.

Low Redevelopment Scenario Traffic Operations

The Low Redevelopment Scenario would result in approximately 20 percent of the front facing properties to be redeveloped by 2040, in the form of the proposed redevelopment. It would add an estimated 100 new jobs and 60 new households.

Impacts to the roadway network would be limited.

- Main Avenue operates at LOS "C" during both A.M. and P.M. peak hours. All approaches are LOS "D" or better during both peak hours. With no redevelopment, Main Avenue operates at LOS "B" and "C" during the A.M. and P.M. peak hours, respectively.
- 4th Avenue operates at LOS "A" during the A.M. peak hour and LOS "C" during the P.M. peak hour. However, the minor approaches operate deficiently at LOS "F" during the P.M. peak. With no redevelopment, 4th Avenue operates at an acceptable LOS on the sidestreets, highlighting the increased activity on these approaches.
- 7th Avenue operates at LOS "F" during both A.M. and P.M. peak hours. Due to high volumes, the all-way stop control operates deficiently for the major approaches. With no redevelopment, 7th Avenue operates at LOS "F" during both peak hours.
- 13th Avenue operates at LOS "C" during the A.M. peak hour and LOS "D" during the P.M. peak hour. All approaches are LOS "D" or better during both peak hours. With no redevelopment, 13th Avenue operates at LOS "C" during both peak hours.

In summary, the intersection operations remains relatively constant with the exception of the sidestreet operations at 4th Street that breaks down to a LOS "F" due to the increased traffic flow to/from the new development.

Medium Redevelopment Scenario Traffic Operations

The Medium Redevelopment Scenario would result in 30 to 40 percent of the front facing properties to be redeveloped by 2040, including the proposed redevelopment. It would add an estimated 223 new jobs and 183 households. This includes jobs and households added in the Low Redevelopment Scenario.

Even with 30 to 40 percent redevelopment, Sheyenne Street operates efficiently at most locations.

- Main Avenue operates at LOS "C" during the A.M. Peak but falls to LOS "D" during the P.M. peak. All approaches are LOS "D" or better during the A.M. peak; the eastbound approach is deficient at LOS "E" during the P.M. peak.
- 4th Avenue operates at LOS "A" during the A.M. peak but falls to LOS "E" during the P.M. peak. The minor approaches operate at LOS "D" during the A.M. peak, but during the P.M. peak fall to LOS "F".
- No changes to the 7th Avenue intersection operations; it operates at LOS "F" during both peak hours.
- 13th Avenue operates at LOS "C" during the A.M. peak but falls to LOS "D" during the P.M. peak. All approaches are LOS "C" or better during the A.M. peak; the westbound approach is LOS "E" with all other approaches LOS "D" or better during the P.M. peak.

Again, no significant operational or capacity improvements on Sheyenne Street are warranted solely on the basis of supporting redevelopment; deficiencies can be improved with traffic control adjustments and minor geometric changes.

High Redevelopment Scenario Traffic Operations

The High Redevelopment Scenario would result in 50 to 60 percent of the front facing properties to be redeveloped by 2040. It would add an estimated 398 new jobs and 258 new households. These estimates include jobs and households added in the Low and Medium Redevelopment Scenarios.

At 50 to 60 percent redevelopment, most intersections operate efficiently, but certain approaches fall deficient.

- The Main Avenue intersection operations do not change from the Medium Redevelopment Scenario; Main Avenue operates at LOS "C" during the A.M. peak with all approaches LOS "D" or better. During the P.M. peak, the intersection operates at LOS "D" with the eastbound approach deficient at LOS "E".
- 4th Avenue operates at LOS "A" during the A.M. peak; the eastbound approach is deficient at LOS "E". The P.M. peak operates at LOS "F" with both minor approaches at LOS "F".
- There is no operational change at the 7th Avenue intersection; it operates at LOS "F" during both A.M. and P.M. peaks. During both peak hours northbound and southbound approaches are deficient at LOS "F".
- The 13th Avenue intersection operations do not change from the Medium Redevelopment Scenario; 13th Avenue operates at LOS "C" during the A.M. peak with all approaches at LOS "C" or better. During the P.M. peak, the intersection operates at LOS "D". The westbound approach is deficient at LOS "E" while all other approaches operate at LOS "D" or better.

Summary of Traffic Operations

Main Avenue and 13th Avenue operate at LOS "D" or better under all redevelopment scenarios. It is unlikely that any redevelopment will necessitate major geometric changes. Installing an eastbound right-turn lane at the Main Avenue intersection will benefit that movement, but have limited impacts to overall intersection operations.

Beginning with the Low Redevelopment Scenario, the west 4th Avenue approach begins to operate at LOS "F" during the P.M. peak. Moving into the higher redevelopment scenarios, this delay becomes so great that the average delay per vehicle at the intersection becomes deficient. Based on projected volumes, it is possible this intersection will meet traffic control signal warrants with a Medium Redevelopment Scenario. If nearby low-volume roadways are closed, it is possible redirected traffic using 4th Avenue could result in the intersection meeting warrants, even with no redevelopment. Alternative improvement strategies will be discussed in Chapter V) Review of Alternatives.

Under all scenarios, 7th Avenue operates at LOS "F". Under currently projected future volumes, this intersection will likely meet traffic control signal warrants with the Low Redevelopment Scenario. Alternatively, closing nearby roadway approaches may lead to vehicles choosing 7th Avenue, increasing volumes leading to the potential traffic control signal, even without redevelopment.

Under all scenarios, 13th Avenue operates at LOS "D" or better during both A.M. and P.M. peak hours. The westbound approach during the Medium Redevelopment Scenario and High Redevelopment Scenario falls deficient at LOS "E". This analysis differs from that shown in the Sheyenne Street Corridor Study from 13th Avenue to 52nd Avenue due to the use of the Updated Model volumes, instead of the Long Range Transportation TDM volumes used in this analysis. Improvements for this intersection are addressed in Phase I of the study.

Additional items will be evaluated further in Chapter V) Review of Alternatives:

- Traffic control at 4th Avenue
- Traffic control at 7th Avenue

FIGURE IV-5: LOS FOR LOW REDEVELOPMENT SCENARIO

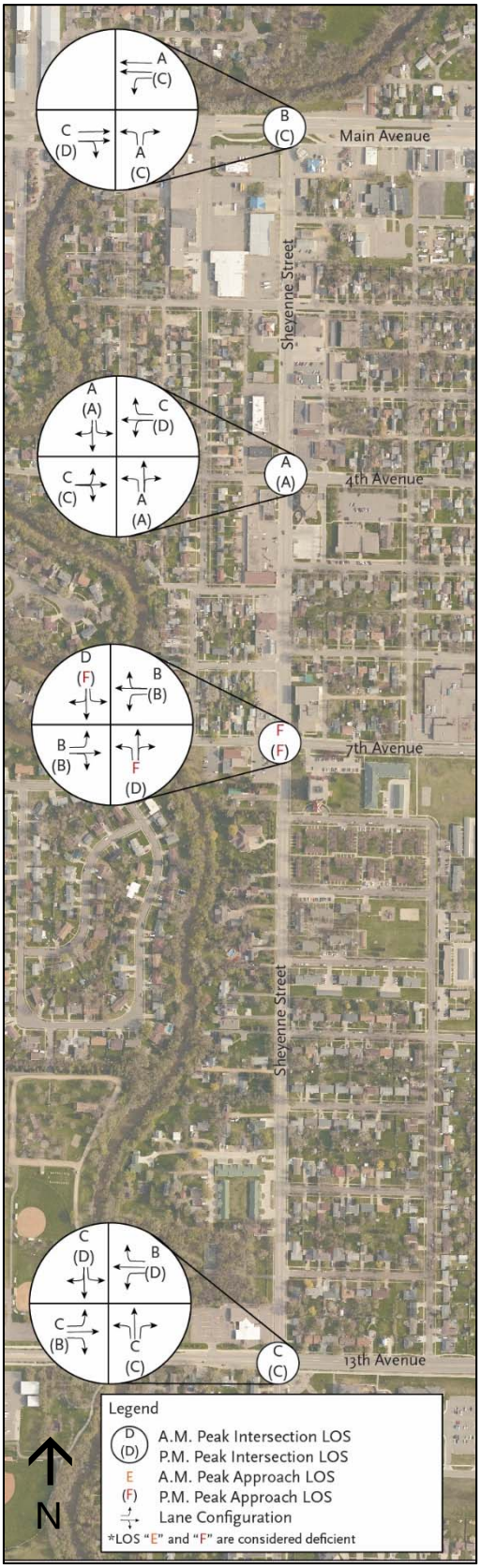


FIGURE IV-6: LOS FOR LOW REDEVELOPMENT SCENARIO

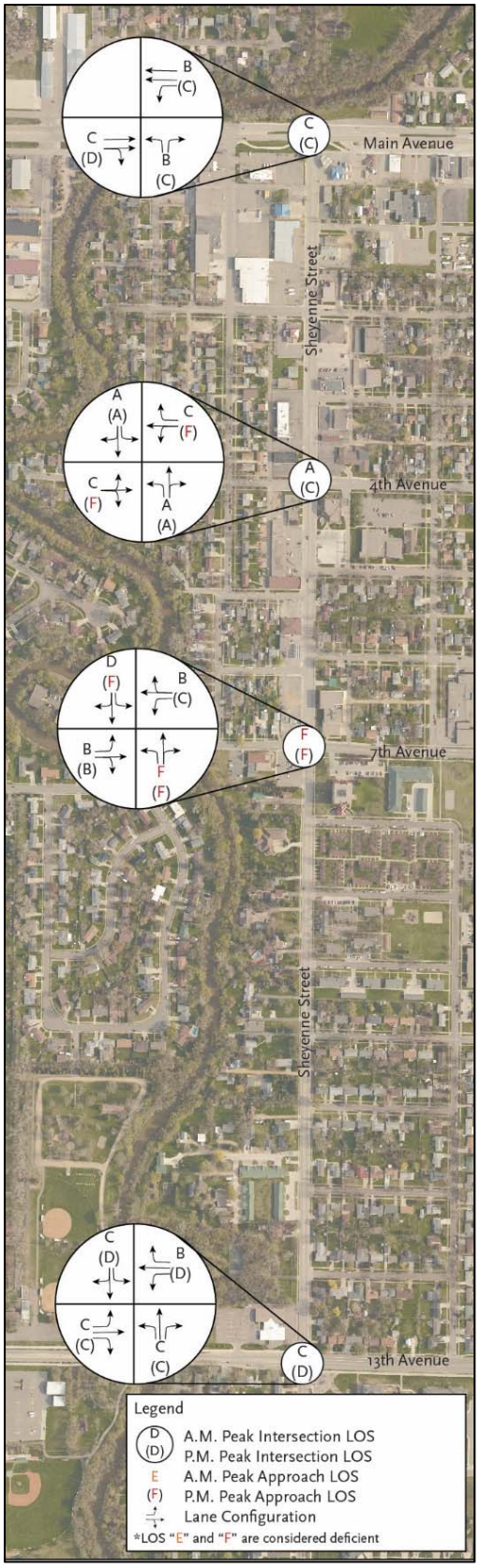


FIGURE IV-7: LOS FOR MEDIUM REDEVELOPMENT SCENARIO

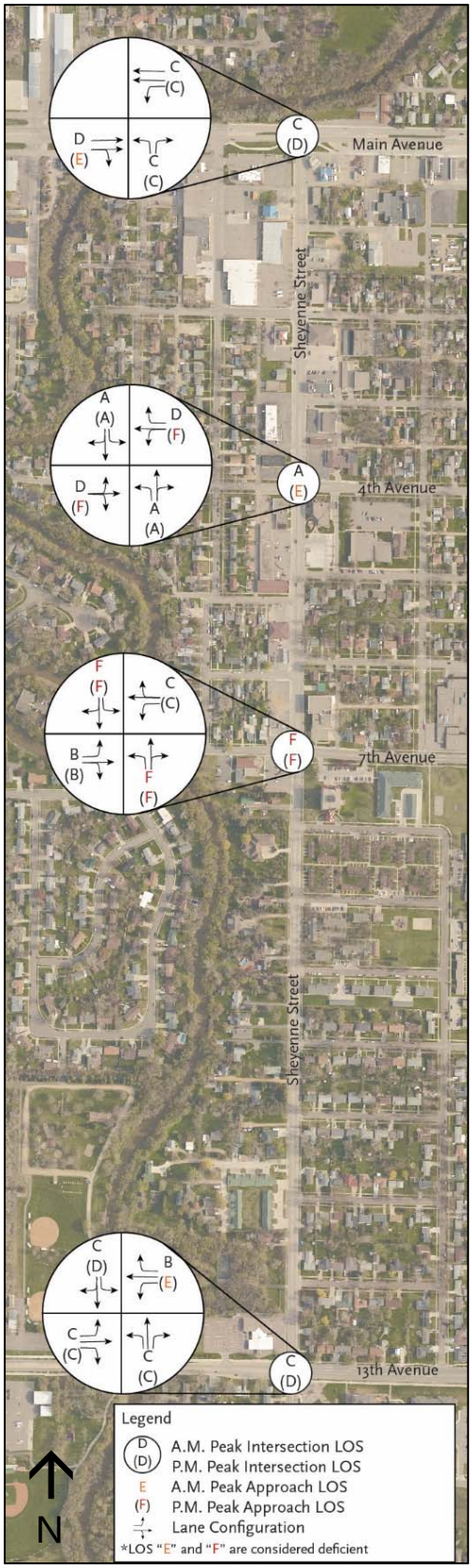
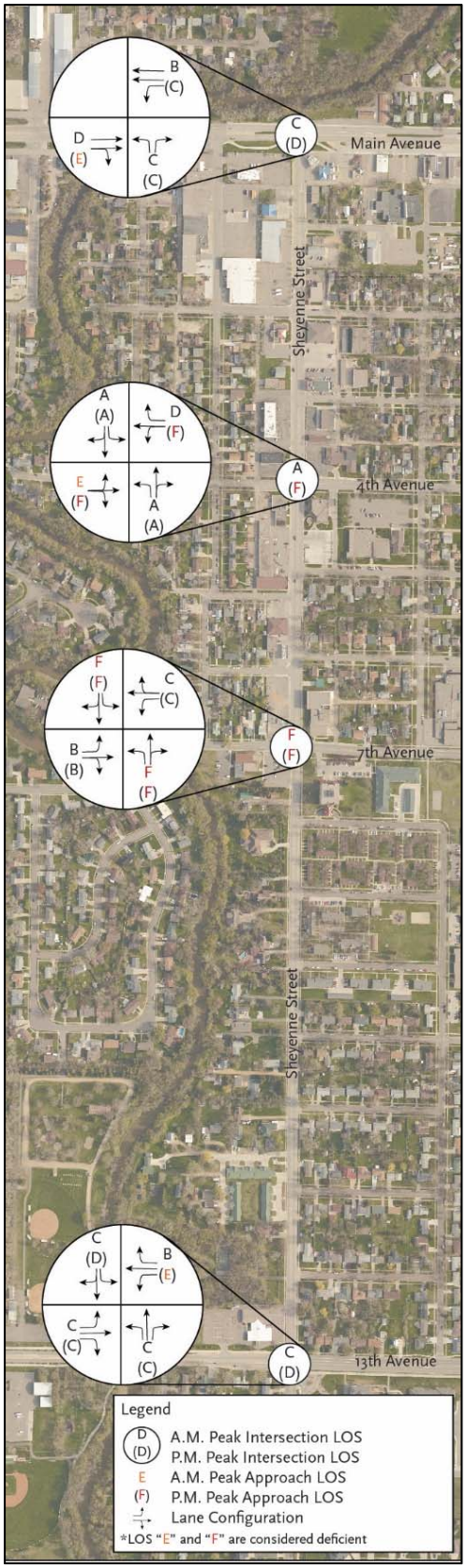


FIGURE IV-8: LOS FOR HIGH REDEVELOPMENT SCENARIO



Parking Demand and Supply for the Low Redevelopment Scenario

The variety of proposed uses in this scenario will use parking very differently throughout the day and on weekends. For example, typical office workers will require parking beginning around 7:30 A.M. and rarely after 5:00 P.M., while residential uses will likely require parking beginning around 5:00 P.M. until about 7:30 A.M. For this reason, parking demand was calculated using time-of-day factors provided by ITE's *Parking Generation Manual.* The developer will provide underground parking for residential uses, with all other uses needing on- or off-street parking.

This analysis was completed using preliminary site plans provided to the study team in August 2015. The development has evolved since, but analysis was not updated. The purpose of this analysis is to highlight that a much lower parking supply is necessary than current West Fargo City Ordinances require.

Parking Demand

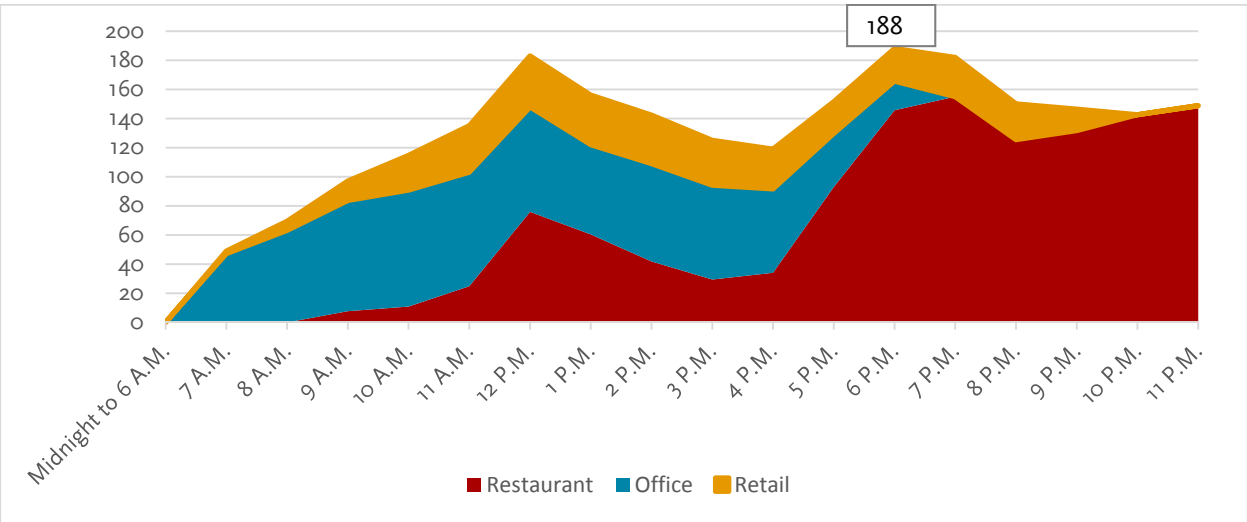
Parking demand was calculated with the following assumptions and generation rates:

- **Residential Uses.** The average residential unit is 900 square feet for approximately 10 units per floor. With three floors per building, it is expected there will be 60 new residential units in this redevelopment project. The ITE *Parking Generation Manual* estimates a peak demand of approximately 75 parking spaces required for both weekdays and weekends.
- **Office Uses.** There is slightly more than 13,500 square feet of leasable area per building. The ITE *Parking Generation Manual* estimates a peak use of 2.84 parking spaces per 1,000 square feet of leasable area, for a peak demand of 80 parking spaces required for weekdays and zero required for weekends.
- **Retail Uses.** Since the VFW is expected to occupy the south building, it is expected that the north building will be entirely retail uses, with slightly more than 13,500 square feet of leasable area. The *ITE Parking Generation Manual* estimates a peak demand of 35 parking spaces for weekday and 40 parking spaces required for weekend.
- **Restaurant Uses.** The VFW is expected to be the primary restaurant user in this development. It will occupy the entire south building. The ITE *Trip Generation Manual* would require 13.3 parking spaces per 1,000 square feet of gross leasable area during the weekdays and 16.3 parking spaces per 1,000 square feet of gross leasable area for weekends. However, the VFW currently only provides parking at a rate of 8.05 parking spaces per 1,000 square feet. Given that traffic to a new building will likely increase, these two rates were averaged together requiring 11.25 parking spaces per 1,000 square feet during weekdays and 12.75 parking spaces per 1,000 square feet during weekends.

Just like in trip generation, increasing land use diversity will likely decrease parking needs since people will be able to link their trips and not require a new parking space for each trip. Nationwide studies estimate reductions for parking needs anywhere from 10 to 30 percent for mixed-use developments, similar to the proposed redevelopment. With this reduction, it is likely that parking would likely be over supplied, close to the 85 percent target that prevents "cruising for parking", discouraging visitors or winter declines in spaces due to snow cover.

Figure IV-9 show estimated time-of-day usage for a typical weekday. The 12 Noon hour is a heavily utilized time for all three Restaurant, Office and Retail uses resulting in the second highest demand of the day. However, at 6 P.M., the restaurant approaches peak demand, resulting in the highest demand of the weekday at 188 vehicles.

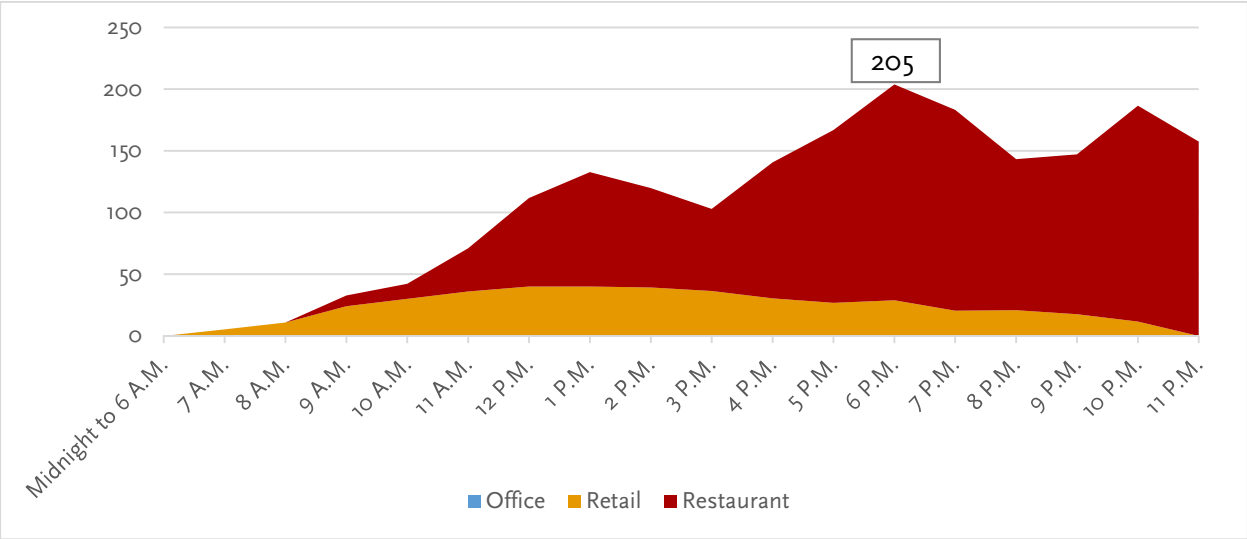
FIGURE IV-9: WEEKDAY PARKING DEMAND FOR LOW REDEVELOPMENT SCENARIO



Residential parking needs were not included in this analysis due to underground parking.

Figure IV-10 shows estimated time-of-day usage for a typical weekend. Office is expected to require zero spaces, since typical offices are not open on weekends. Again, the Restaurant use is expected to drive parking demand. During the 6 P.M. hour, it is expected demand will approach 205 parking spaces.

FIGURE IV-10: WEEKEND PARKING DEMAND FOR LOW REDEVELOPMENT SCENARIO



Residential parking needs were not included in this analysis due to underground parking.

It is important to acknowledge that these charts are representative of expectations for typical days. Variability should be expected, especially during special events like West Fest, Cruise Night or other events hosted by the VFW.

Parking Supply

Based on the preliminary site layout, the developer has provided 190 total parking spaces with interest in adjusting the site plan to accommodate angled parking on 5th Avenue and along Sheyenne Street. With 60 degree angled parking, it is expected 47 additional spaces can be accommodated.

- **5th Avenue West**. With a 30 foot setback from the intersection at Sheyenne Street and the alleyway, there is approximately 85 feet for angled parking which will fit seven additional spaces.
- **Sheyenne Street from 2nd Avenue to 4th Avenue.** Making adjustments to the current pedestrian features this block could provide 190 feet of Sheyenne Street curb space to accommodate approximately 17 additional spaces. This would not impact existing parking lot configurations.
- **Sheyenne Street from 4th Avenue to 5th Avenue West.** Again, making adjustments to the current pedestrian features, this block could provide 250 feet of Sheyenne Street curb space to accommodate approximately 23 additional parking spaces. This would not impact existing parking lot configurations.

The city's application of the overlay parking requirements of 3 spaces per 1,000 square feet would result in 163 parking spaces required, assuming that all residential parking needs would be provided through underground parking. The overlay parking requirements for commercial and office are anywhere from 25 percent lower for commercial uses and 70 percent lower for restaurant uses. While parking generation based on the preliminary site plan is estimated at 205, the on- and off-street parking would provide adequate parking spaces. Given the highest use times are after typical office hours and on weekends, angled parking on Sheyenne Street may not be necessary if shared-use parking agreements could be reached with Bell State Bank, West Funeral Home and/or Payroll Express.

Summary of Parking Generation

Currently, parking is over supplied; the parking demand study completed Summer 2015 found there were 760 spaces still available during the 12 Noon hour, the highest parking demand. However, as redevelopment occurs, demand for on- and off-street parking will increase. Parking supply and demand will need to be evaluated with each new redevelopment beyond the Low Redevelopment Scenario to ensure it is not over or under supplied.

Under the Low Redevelopment Scenario, the developer has included 190 parking spaces for the restaurant, retail and office uses. With site plan alterations to improve connectivity at 4th Street, only 170 spaces would be available. Additional spaces can be found with 60 degree angle parking on 5th Avenue and angle or parallel parking on Sheyenne Street. With on-street parking, there should be adequate parking available for the typical weekday and weekend.

V) Review of Alternatives

Understanding the future needs of this roadway based on a variety of redevelopment scenarios, alternatives were developed to support multimodal operations. Contained within this report are considerations for bicycle facilities, traffic calming alternatives, traffic control, roadway cross-sections, access management, parking, transit and truck routing. Compatible alternatives are identified throughout the report.

Bicycle Plan

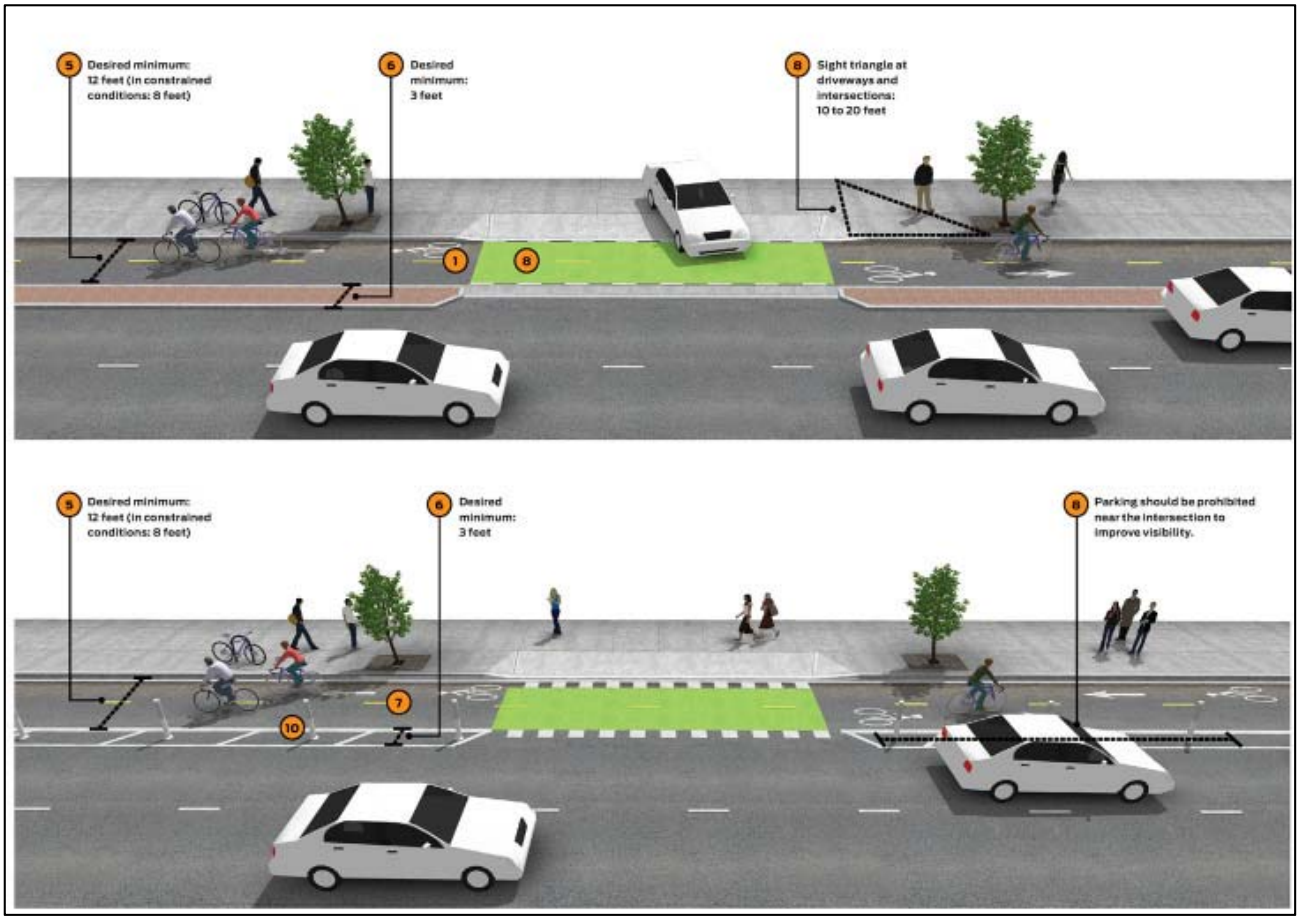
Bicycle Facilities

With relatively high volumes and limited available roadway, providing on-street facilities safely is challenging on Sheyenne Street. However, the high density of driveways and minimal available sidewalk space make off-street facilities undesirable here. Two alternatives are presented; both would provide some form of on-street bicycle facilities.

Separated Bicycle Lanes on Sheyenne Street

Separated bicycle lanes are a physically separated bicycle facility that allows both directions to travel on one side of the road. With barriers separating bicycle traffic from vehicle traffic, bicyclists are protected from getting "doored" from parking vehicles or pressured from vehicle traffic.

FIGURE V-1: DESIGN GUIDANCE FOR SEPARATED BICYCLE LANES

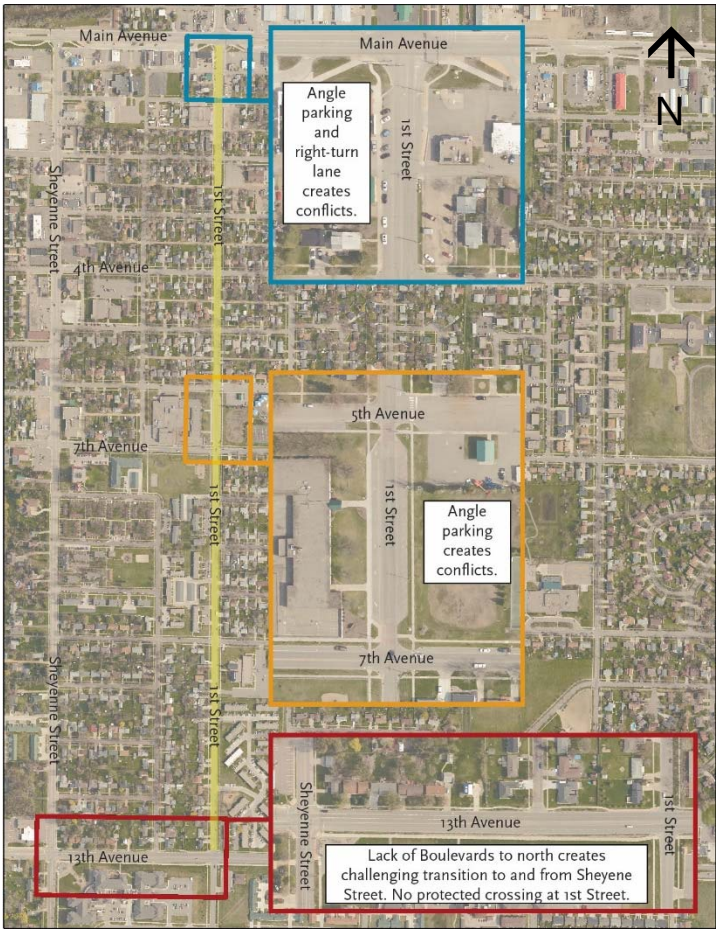


Source: National Association of City Transportation Officials (NACTO)

The National Association of City Transportation Officials (NACTO) provides design guidance for separated bicycle lanes, which was used for their design. Ideally, the protected bicycle lanes would be implemented for the entire stretch of the study corridor, from Main Avenue to 13th Avenue for continuity and convenience. Providing separated bicycle lanes on Sheyenne Street while still low cost, would be higher in cost than moving bicycle traffic to a parallel corridor. This alternative, however, would provide direct access to the downtown area.

A corridor wide layout for the Separated Bicycle Lanes Roadway Alternative can be found in the Roadway Cross-Section Alternatives and Analysis section of this report.

FIGURE V-2: AREAS OF CONCERN FOR BICYCLE LANES ON 1ST STREET



1st Street Bicycle Corridor

With very low traffic volumes, 1st Street, 0.40 miles east of Sheyenne Street, is a good alternative roadway for on-street bicycle facilities. It serves around 2,000 vehicles per day as well as many pedestrian and bicycle generators like parks and the elementary school. Based on NACTO's Urban Bikeway Design Guide, roadways with speeds less than 35 miles per hour and fewer than 3,000 vehicles per day are appropriate for shared bicycle lanes. Three issues will need to be mitigated with this alternative:

- **Connection from Sheyenne Street.** South of 13th Avenue, a shared-use path runs on the east side of Sheyenne Street and the south side of 13th Avenue. Along the north side of 13th Avenue, there are no bicycle facilities. Two potential crossing options exist to tie into the potential bicycle lanes on 1st Street:
    - » Mid-Block Crossing. Advanced stop pavement markings, marked crossings with a rectangular rapid flashing beacon or pedestrian hybrid beacon (if warranted) would increase visibility of pedestrians. The MUTCD provides guidelines for installing Pedestrian Hybrid Beacons (PHB).
    - » Cross at the Sheyenne Street and 13th Avenue intersection and provide a shared-use path from Sheyenne Street to 1st Street only. This would impact boulevards, trees and likely require some ROW acquisition.
- **Angled parking and turn lanes directly south of Main Avenue.** These may create conflicts, making it difficult to connect to the shared-use paths heading east and west along the south side of Main Avenue. For this block, it is recommended that the sidewalks are widened to shared-use paths to avoid these conflicts.

- **Angled parking and the drop-off lane between 6th Avenue and 7th Avenue.** On 1st Street between 6th Avenue and 7th Avenue there is angled parking on the east side of 1st Street and a drop-off lane on the west side. For this section of 1st Street, the shared lanes should transition to bicycle lanes to provide better protection from potential conflicts and delineate exactly where bicycles should travel. It is also recommended that the city consider converting the angled parking to back-in angled parking. This improves visibility of bicyclists and oncoming vehicle traffic alike when drivers are able to drive out of their parking space.

This alternative would be relatively low cost, only requiring signage and the shared lane markings. However, providing a parallel route so far away, requiring a re-route of 0.8 miles, may result in bicyclists riding on the roadway or sidewalks along Sheyenne Street.

Summary of Bicycle Facility Alternatives

Both alternatives have positive and negative aspects. The provision of bicycle facilities will need to balance safety, cost, convenience and design constraints. Table V-1 shows a summary of the positive and negative aspects of each alternative.

Ultimately, the provision of bicycle facilities can be reasonably accommodated both on Sheyenne Street and 1st Street. The determination of location will need to consider vehicular and pedestrian needs as well, specifically from Main Avenue to 7th Avenue, where parking, operations and pedestrian facilities will compete with limited ROW. The needs of Sheyenne Street will be addressed later in this report.

FIGURE V-3: CORRIDOR LAYOUT OF 1ST STREET ON-STREET BICYCLE FACILITIES

TABLE V-1: SUMMARY OF BICYCLE FACILITIES ALTERNATIVES

	Positive	Negative
Separated Bicycle Lanes Alternative	▪ Direct connection to downtown West Fargo. ▪ Potential to provide continuous facilities throughout study area.	▪ Higher cost. ▪ Only one other similar design in the metro. Driver unfamiliarity with separated bicycle lanes may create challenges initially, especially at intersections. ▪ Access density could interfere with operations.
1st Street Bike Corridor Alternative	▪ Low traffic volumes. ▪ Directly adjacent to many pedestrian generators. ▪ Low cost.	▪ Difficult geometric conditions lead to discontinuity of facilities throughout the corridor. ▪ 0.8 mile reroute back to Sheyenne Street may discourage some users. ▪ Difficult connection and crossing from shared-use path south of Sheyenne Street.

Bicycle Parking

Once bicyclists reach downtown, they will need a safe place to store their bicycle. Bicycle parking in a downtown should be located as close to destinations as possible and highly visible. A variety of bicycle rack designs can be used. They can help create a downtown identity or blend into the landscape; they can also be solitary bicycle racks in bulb outs or corrals in a parallel parking space. The city could elect to provide bicycle parking within their ROW or incentivize and/or require new developments to include bicycle parking.

In downtown Fargo, limited bicycle parking is provided within bulb outs at intersections. City of Fargo ordinances also permit a reduction in off-street parking spaces for developments that provide bicycle parking.

FIGURE V-4: BICYCLE PARKING EXAMPLES

Minneapolis, a city known for bicycling, recently amended their bicycle parking regulations to require at least three bicycle parking spaces for most commercial and services land use types.

Pedestrian and Bicycle Connectivity

Providing dedicated crossing facilities across Sheyenne Street is imperative to establishing a safe multimodal corridor. With potential traffic control improvements at 4th Avenue and 7th Avenue and specific configurations evaluated in the Intersection Alternatives and Analysis section of this report, improved crosswalks will be provided approximately every one-quarter mile from Main Avenue to 7th Avenue and every half-mile from 7th Avenue to 13th Avenue. Directing pedestrians to specific intersections will increase pedestrian visibility as motorists begin to see them more frequently.

Sheyenne Street from 7th Avenue to 13th Avenue will have no improved traffic control, making providing specific crossing facilities in this section more difficult. However, there are few generators on the east side of Sheyenne Street in this section making dedicated crossings less important. Including bulb outs and/or medians will reduce exposure and facilitate crossings in this section of Sheyenne Street.

Surrounding Trail and Bicycle Connections

The Downtown Framework Study identified two river crossings in the vicinity of West Fargo's downtown:

- **Trail and Footbridge Connection to Armour Park.** Armour Park is located north of Main Avenue and the Sheyenne River. The Downtown Framework Study suggested connecting the Sheyenne Street corridor to the park with a dedicated trail across Main Avenue and footbridge across the Sheyenne River. An improved trail system through Armour Park and across Main Avenue could connect the small residential neighborhood north of Main Avenue to West Fargo's central business district.
- **Footbridge over the Sheyenne River at 2nd Avenue/ Grieson Avenue.** With sidewalk connections through the neighborhood west of the Sheyenne River, offering a bicycle and pedestrian connection to the West Fargo central business district would encourage stronger foot traffic to a redeveloping downtown. With imminent redevelopment and the potential for increased transit, this would be an important connection during the non-winter months.

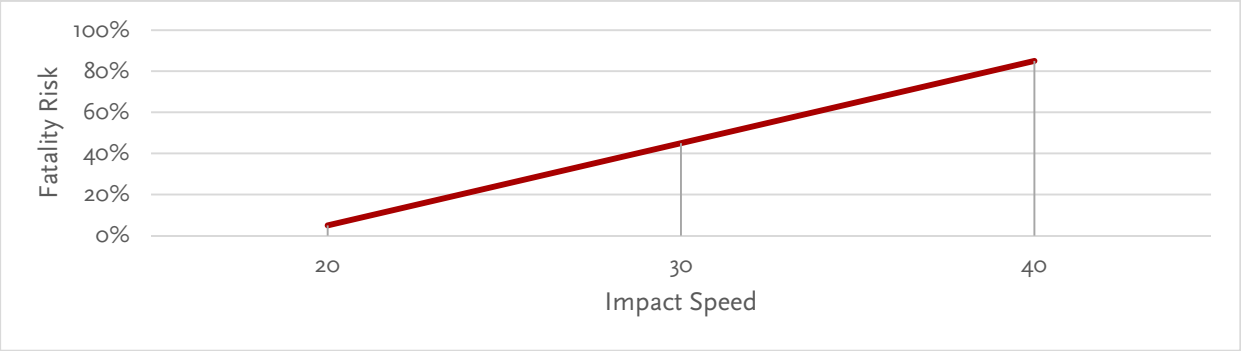
These alternatives can be seen in Figure V-5.

FIGURE V-5: POTENTIAL TRAIL AND FOOTBRIDGE CONNECTIONS

Traffic Calming

Traffic calming is a traffic management approach that forces motorists to reduce their speed or direction of travel to enhance roadway safety for motorists, pedestrians and bicyclists alike. As Sheyenne Street is functionally classified as a Minor Arterial through the downtown, traffic calming alternatives will focus on reducing speeds, not diverting traffic. Even though speed was not identified as a problem during the existing conditions analysis, keeping speeds low is imperative on a multimodal corridor. Research has found that a pedestrian-vehicle collision with vehicle speeds at 20 miles per hour, a pedestrian has a 95 percent chance of survival. Increase those speeds to 30 miles per hour and a pedestrian's survivability decreases to just 55 percent, and at 40 miles per hour, just 15 percent.

FIGURE V-6: IMPACT SPEED VERSUS FATALITY RISK



Source: National Highway Traffic Safety Administration

Furthermore, traffic calming will likely make this corridor less appealing to trucks and through traffic. Trucks would be forced to divert to other designated truck routes, discussed later in this study, but passenger vehicles would choose the next fastest parallel route, which could be 1st Street, or maybe 9th Street, depending on their origin and destination.

Traffic calming features included in most alternatives are described below.

Reduced Lane Width

Using pavement markings to reconfigure and narrow lanes results in a psychological feeling of confinement which increases motorist awareness and cautiousness resulting in reduced speeds. Research has found a one to three mile per hour reduction in the 85th percentile free-flow speed with reduced lane widths. Currently, lane widths are 12 to 13 feet throughout the corridor. Studies have found minimal changes in crash potential with lanes as narrow as 10 feet in low speed urban settings.

Raised Medians

A raised median is a curbed section located along the roadway centerline that separates both directions of traffic and provides a pedestrian refuge island. This alternative effectively

- Reduces lane widths and travel speeds
- Provides aesthetic enhancements in a neighborhood to indicate a change in traffic conditions
- Acts as a pedestrian refuge island, reducing crossing exposure and improving pedestrian visibility

FIGURE V-7: RAISED MEDIAN WITH PEDESTRIAN REFUGE AND GREEN SPACE

Studies have found raised medians reduce vehicle-pedestrian crashes by an average of 46 percent and reduce travel speeds by seven percent.

Bulb Outs

Bulb outs extend the curb at intersections with high pedestrian activity or dedicated crosswalks. The curb-to-curb width of the roadway is reduced by the length of the on-street parking lanes, encouraging motorists to reduce speeds at the intersection and reducing crossing exposure for pedestrians. The tighter turning radius slows turning vehicles. They help define the intersections and offer aesthetic benefits as well. This alternative effectively reduces 85th percentile speeds up to four percent.

FIGURE V-8: BULB OUT AT INTERSECTION WITH GREEN SPACE AND PARALLEL PARKING

Summary of Traffic Calming Alternatives

While other traffic calming techniques are available, the options presented in this report best match the context of downtown while providing additional benefits to pedestrians and bicyclists. Used together, these traffic calming measures will increase friction in the system and create a sense of confinement, ultimately slowing drivers down, reducing crash potential and severity and doubling as opportunities for aesthetic improvements. However, 1st Street should receive traffic calming treatments as well to discourage through traffic from selecting that route.

Intersection Alternatives and Analysis

The capacity analysis completed for the Low, Medium and High Redevelopment Scenarios, showed capacity issues are primarily isolated to the intersections. Below is a summary of intersection operations:

- Main Avenue operates at LOS "D" or better under all redevelopment scenarios.
- Beginning with the Medium Redevelopment Scenario, operations become deficient at 4th Avenue due to long queues on the side streets: eastbound estimated queues of 200 feet (which would block the alleyway and secondary access into the new development), westbound estimated queues 280 feet (blocks right turn lane and business driveways.
- Under all scenarios, 7th Avenue operates at LOS "F".
- Under all scenarios, 13th Avenue operates at LOS "C" during the A.M. peak hour and LOS "D" during the P.M. peak hours. The westbound approach during the Medium Redevelopment and High Redevelopment scenarios fall deficient at LOS "E". This analysis differs from that shown in the Sheyenne Street Corridor Study from 13th Avenue to 52nd Avenue due to the use of the Updated Model volumes completed as part of the Southwest Subarea Study, instead of the Long Range Transportation Plan model volumes used in this analysis.

While there are some deficient approaches and intersection operations, a roadway serving a downtown like this section of Sheyenne Street must balance vehicular traffic needs as well as pedestrian, bicycle, transit, parking and aesthetic needs of the corridor, referred to in this report as a ***balanced scorecard approach***. The balanced scorecard approach attempts to quantify each mode of transportation (vehicle, pedestrian, bicycle and transit) with a comparable level of service (LOS). It also does not prioritize one mode over another. Improvement

strategies will evaluate geometric changes, traffic control changes and bicycle and pedestrian facilities required to provide a successful multimodal corridor.

Analysis Period

The P.M. peak hour is the highest traffic volume hour and will be used for analysis in this report. Depending on the intersection and redevelopment scenario, the P.M. peak is 7.4 to 17.2 percent higher than the A.M. peak. While this approach prioritizes vehicular operations, it also shows only minor geometric and traffic control improvements are needed under any redevelopment scenario to improve operations during the highest hour of the day, suggesting the rest of the day will operate efficiently.

Improvement Strategies

A variety of improvement strategies are available for the four study intersections, as needed throughout the redevelopment scenarios.

Main Avenue Intersection

This intersection operates efficiently at LOS "D" during the P.M. peak for all redevelopment scenarios, so no geometric improvements are actually required. However, the eastbound approach falls deficient to LOS "E" during the Medium and High Redevelopment Scenarios. Constructing a right-turn lane on the eastbound approach would improve the approach and intersection operations to LOS "C" for all redevelopment scenarios.

TABLE V-2: IMPROVEMENTS AT MAIN AVENUE INTERSECTION

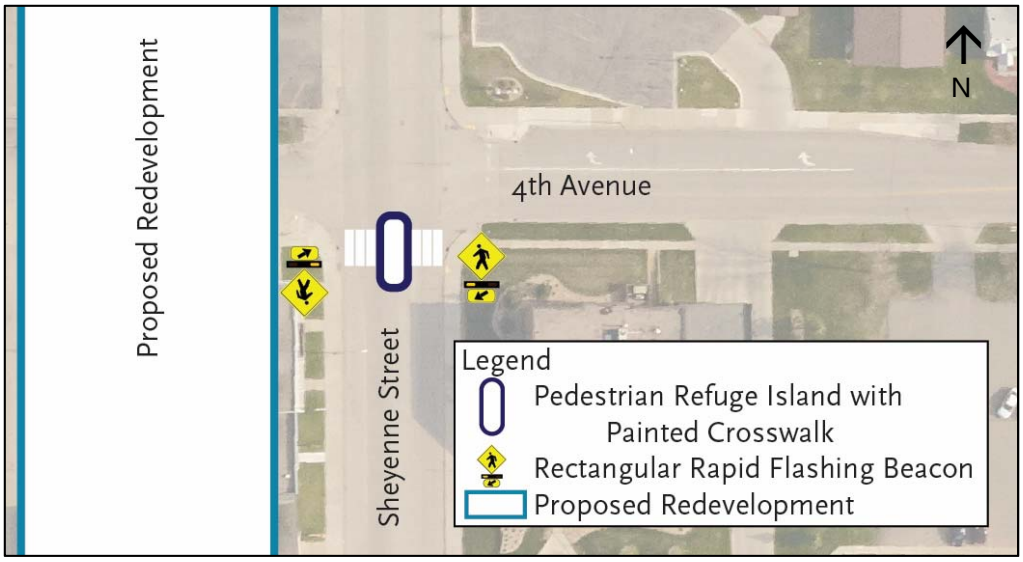
Scenario	Existing Geometry Intersection LOS [Eastbound Approach LOS]	Dedicated Eastbound Right-Turn Lane Intersection LOS [Eastbound Approach LOS]
Low Redevelopment Scenario (P.M. Peak)	C [D]	C [C]
Medium Redevelopment Scenario (P.M. Peak)	D [E]	C [C]
High Redevelopment Scenario (P.M. Peak)	D [E]	C [C]

4th Avenue Intersection

As the proposed redevelopment has evolved, new plans include a park that would require closing 4th Avenue west of Sheyenne Street. This park would be a major amenity to downtown West Fargo and likely become a major pedestrian and bicycle generator. A protected pedestrian crossing is critical at this location.

Pedestrian hybrid beacons require meeting the guidelines presented in the MUTCD, which based on current and future pedestrian and traffic volumes, this location is unlikely to meet. Alternatively, rectangular rapid flashing beacons have push buttons that pedestrians can activate. They then wig-wag to draw attention to potential pedestrian

FIGURE V-9: 4TH AVENUE PROTECTED PEDESTRIAN CROSSING



conflicts. Research compiled by MnDOT found a 78 percent or greater yielding compliance from drivers after installation of RRFBs. Including a pedestrian refuge island will permit pedestrians to cross one direction of traffic at a time and has been found to reduce crashes by 46 percent. An RRFB, combined with a pedestrian refuge island will provide a safe and efficient pedestrian crossing to the proposed redevelopment.

Traffic from residential developments west of Sheyenne Street will be funneled either to the existing 5th Avenue through the existing alleyway or to an access the developer is including that would be across from the existing 3rd Avenue. It is unlikely that either of these locations would ever warrant a traffic control signal. Additionally, poor operations are expected during peak hours.

If the park concept is ultimately abandoned and traffic is allowed to funnel to 4th Avenue from the new development and from the north and south, a traffic control signal will eventually be warranted and would provide great access to and from the new development, but would be at the expense of the park connecting the development and downtown as a whole. A traffic control signal would provide a protected pedestrian crossing and create corridor continuity with the existing and planned traffic control signals at Main Avenue, 7th Avenue and 13th Avenue.

7TH AVENUE INTERSECTION

Under all redevelopment scenarios, this intersection operates at LOS "F" during both A.M. and P.M. peaks. Improvement strategies at this location could include a roundabout or traffic control signal.

Roundabout Alternative

Given traffic volumes, a roundabout at this intersection would have to be full size, likely impacting ROW with a much higher cost than a mini-roundabout.

Additionally, the roundabout is deficient with any redevelopment scenario. Under the High Redevelopment Scenario, southbound queues during the P.M. peak are estimated to extend almost 800 feet, blocking business access and 5th Avenues and 6th Avenues.

FIGURE V-10: ROUNDABOUT AT 7TH AVENUE

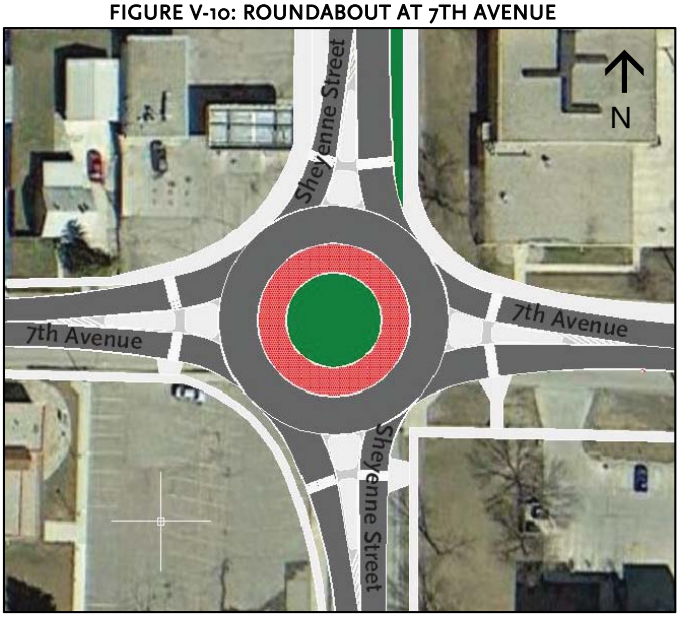


TABLE V-3: ROUNDABOUT AT 7TH AVENUE INTERSECTION

Scenario	AWSC Intersection LOS [Worst Approach LOS]	Roundabout Intersection LOS [Worst Approach LOS]
Low Redevelopment Scenario (P.M. Peak)	F [F]	E [F]
Medium Redevelopment Scenario (P.M. Peak)	F [F]	F [F]
High Redevelopment Scenario (P.M. Peak)	F [F]	F [F]

Traffic Control Signal Alternative

As discussed above, to install a traffic control signal at this intersection, certain thresholds would have to be met. While volumes do not currently meet traffic control signal warrants, it is likely to meet the Four-Hour Vehicular Volume Warrant by 2040, even under the No Redevelopment Scenario. Any amount of redevelopment along the corridor would could result in the Four-Hour Vehicular Volume warrant being met before 2040.

Safety

This intersection also approaches meeting the Crash Experience Warrant. The Crash Experience Warrant is met if five crashes that could be mitigated with a traffic control signal occur within 12 months. There were five angle crashes in 13 months, narrowly missing the required time frame; all of these crashes had contributing factors of failure-to-yield, suggesting drivers are disregarding the all-way stop control (AWSC). Signalizing this intersection would likely reduce angle type crashes, which are typically the most severe types of crashes, but could potentially increase rear end type crashes common at signalized intersections. With effective coordination along the corridor, this could be mitigated.

Traffic Volumes

With a signal, traffic operations would be improved to LOS "B" for all redevelopment scenarios. Northbound and southbound queues would be reduced from 340 feet on both north and south approaches under AWSC to 60 and 215, respectively, with a traffic control signal.

Pedestrian and Bicycle Operations

Providing a signalized intersection at 7th Avenue would also facilitate a pedestrian crossing. With relatively low pedestrian volumes and trends suggesting vehicles do not acknowledge the AWSC, pedestrians may have difficulty judging traffic when trying to cross the roadway. Providing a signalized crossing would help find gaps in traffic to safely cross. A signal at this location would be approximately one-half mile from each of the two existing signals along the corridor. A signal at this location and at 4th Avenue would provide approximately one-quarter mile signal spacing, which is desirable for pedestrians. Design considerations would limit the impact signal standards had on pedestrian spaces.

Truck Operations

Since a traffic control signal is one of the most common traffic control devices, no difficulties for trucks would be expected.

Cost

A new traffic control signal has an estimated cost of $300,000.

TABLE V-4: TRAFFIC CONTROL SIGNAL AT 7TH AVENUE INTERSECTION

Scenario	AWSC Intersection LOS [Worst Approach LOS]	Traffic Control Signal Intersection LOS [Worst Approach LOS]
Low Redevelopment Scenario (P.M. Peak)	F [F]	B [C]
Medium Redevelopment Scenario (P.M. Peak)	F [F]	B [C]
High Redevelopment Scenario (P.M. Peak)	F [F]	B [C]

Summary of Intersection Alternatives at 7th Avenue

The roundabout is deficient under all redevelopment scenarios and would likely require ROW acquisition. A traffic control signal at 7th Avenue would limit queues and improve operations, it would facilitate pedestrian crossing safety.

13TH AVENUE INTERSECTION

Phase I of the Sheyenne Street Corridor used the Updated Travel Demand Model outputs for a more conservative approach. This resulted in turning movement counts that were approximately equal to the High Redevelopment Scenario's turning movement counts. For this reason, geometric improvements recommended in Phase I will be sufficient to process all increased traffic from redevelopment. The Phase I Sheyenne Street Corridor Study recommended:

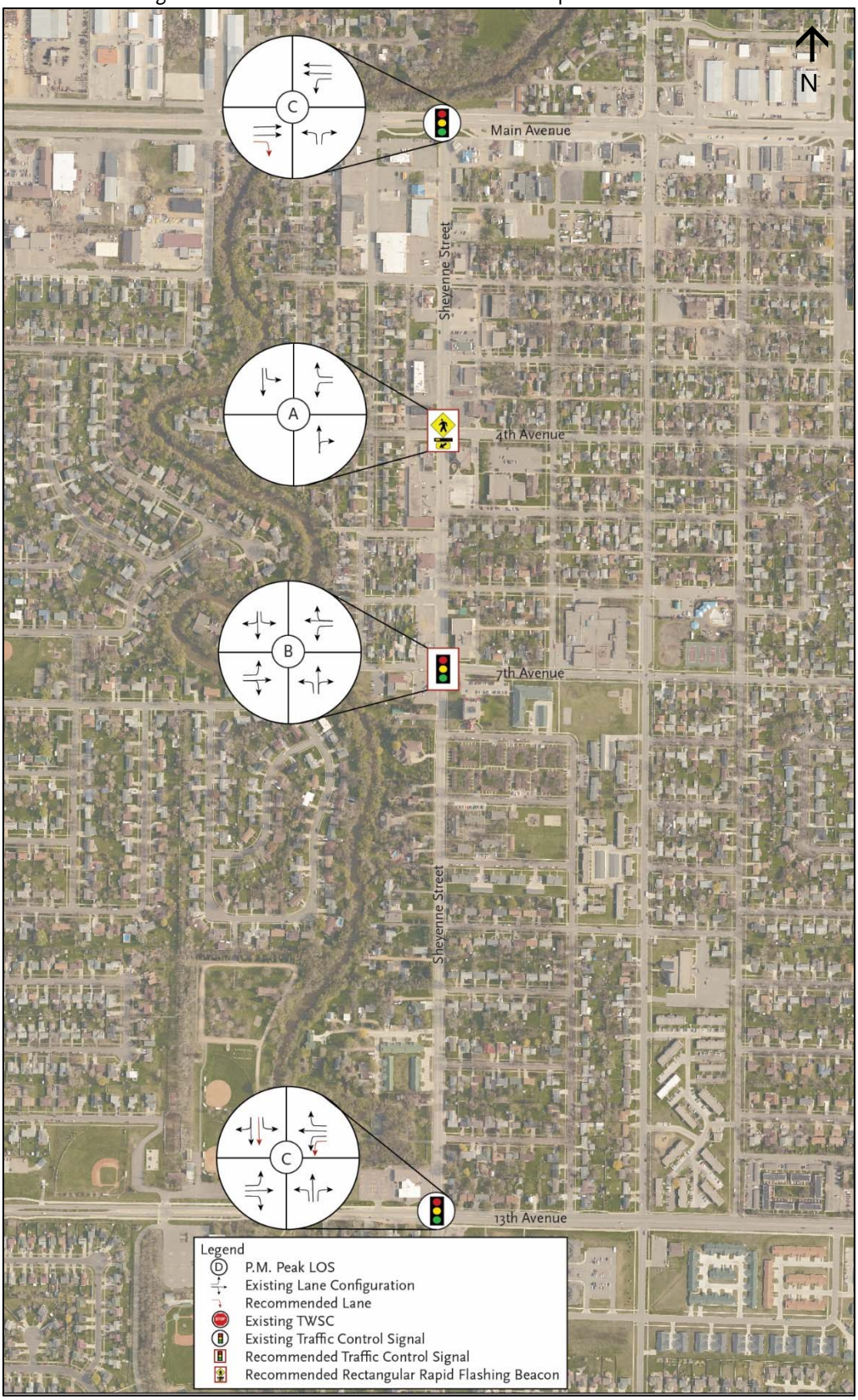
- A second southbound through lane
- A double left-turn lane at the westbound approach

Summary of Recommended Intersection Alternatives

A variety of improvements would be required under each redevelopment scenario. Specific improvements recommended for each redevelopment scenario are shown in Figure V-11 with general recommendations below.

- At Main Avenue, a right-turn lane would become necessary under the Medium Redevelopment Scenario. This should be considered as part of any Sheyenne Street improvement plan.
- At 4th Avenue, a rectangular rapid flashing beacon and pedestrian refuge island will provide a safe and efficient crossing to the proposed park and redevelopment. If these plans are abandoned, a traffic control signal should be installed once warranted.
- At 7th Avenue, a traffic control signal would likely be warranted with the Low Redevelopment Scenario. A roundabout at this intersection is deficient under all redevelopment scenarios and is not recommended.
- At 13th Avenue, a second southbound through lane and double left-turn lane at the westbound approach should be considered as part of any Sheyenne Street improvement plan.

Figure V-11: Recommended Traffic Control Improvement Plan



Roadway Cross-Section Alternatives and Analysis

The study evaluated as many feasible alternatives as possible to facilitate a detailed discussion with the city, businesses and general public. The alternatives for both sections of Sheyenne Street, Main Avenue to 7th Avenue and 7th Avenue to 13th Avenue, were constrained to the existing roadway width. The alternatives considered could not require major reconstruction efforts either. Furthermore, since redevelopment is imminent in downtown West Fargo, primarily along 4th Avenue, the alternatives need to be able to be implemented quickly. For cost considerations, curb improvements were limited as much as possible.

Sheyenne Street from Main Avenue to 7th Avenue

One through lane in each direction is sufficient to provide acceptable vehicular operations throughout the corridor. Impacts to transit were not considered. However, bulb outs and improved pedestrian areas would be useful for transit shelters and on- and off-loading. Alternatives presented in this section have different benefits, costs and levels of accommodation for pedestrians and bicyclists.

Scoring was completed for four categories: operations, safety, business impacts and cost. Descriptions are provided below in Table V-5. A score of five represents the best possible score, with a score of one representing the worst possible score.

TABLE V-5: SCORING SUMMARY FOR ROADWAY ALTERNATIVES FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

	VEHICULAR	PEDESTRIAN	BICYCLE
OPERATIONS	Scoring for vehicular operations prioritized alternatives that maintained dedicated turn lanes for major accesses while reducing access risk.	Scoring for pedestrian operations prioritized alternatives that improved the ability to cross Sheyenne Street safely and easily. This also included effective sidewalk width for increased comfort.	Scoring for bicycle operations prioritized alternatives that provided dedicated facilities where bicycles do not compete for roadway space.
SAFETY	Vehicular safety scoring evaluated the likely reduction in crash potential or crash severity. For example, two-way left-turn lanes reduce rear-end crash potential, while traffic calming techniques reduce crash severity.	Pedestrian safety evaluated the use traffic calming techniques that slowed vehicular traffic, reduced crossing exposure and provided separation from travel ways.	Bicycle safety scoring evaluated the use of dedicated and separated facilities.
BUSINESS IMPACTS	Within this scoring criteria, changes to the parking supply and ROW impacts were considered. ▪ Additional on-street parking and no ROW impacts was most desirable. ▪ Removal of all on-street parking, ROW impacts that require property acquisitions or relocations was least desirable. None of the build alternatives required property acquisition or relocation. The scoring was developed in this fashion in the event that the range of alternatives was expanded in the future.		
COST	Potential costs include pavement markings, relocating lighting and signs, ROW and easement purchases and concrete work for bulb outs and medians. ▪ The lowest cost alternatives was most desirable. ▪ The highest cost alternatives was least desirable. A score of one was considered full reconstruction to implement the alternatives. This allows the scoring to incorporate any additional alternatives that may need to be considered. No alternatives considered full reconstruction; no score of one was assigned.		

Do-Nothing Roadway Alternative

This alternative would not require any geometric changes, leaving the roadway with a 13-foot and 12-foot driving lane, an 11-foot turn lane and an 11-foot parking lane. There are no bicycle facilities; pedestrian facilities remain unchanged. It would provide acceptable vehicular operations, but pedestrian and bicycle facilities would not be improved. This alternative does not address any of the existing safety deficiencies or enhance pedestrian or bicycle safety. This alternative would have no business impacts and be the lowest cost.

FIGURE V-12: DO-NOTHING ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

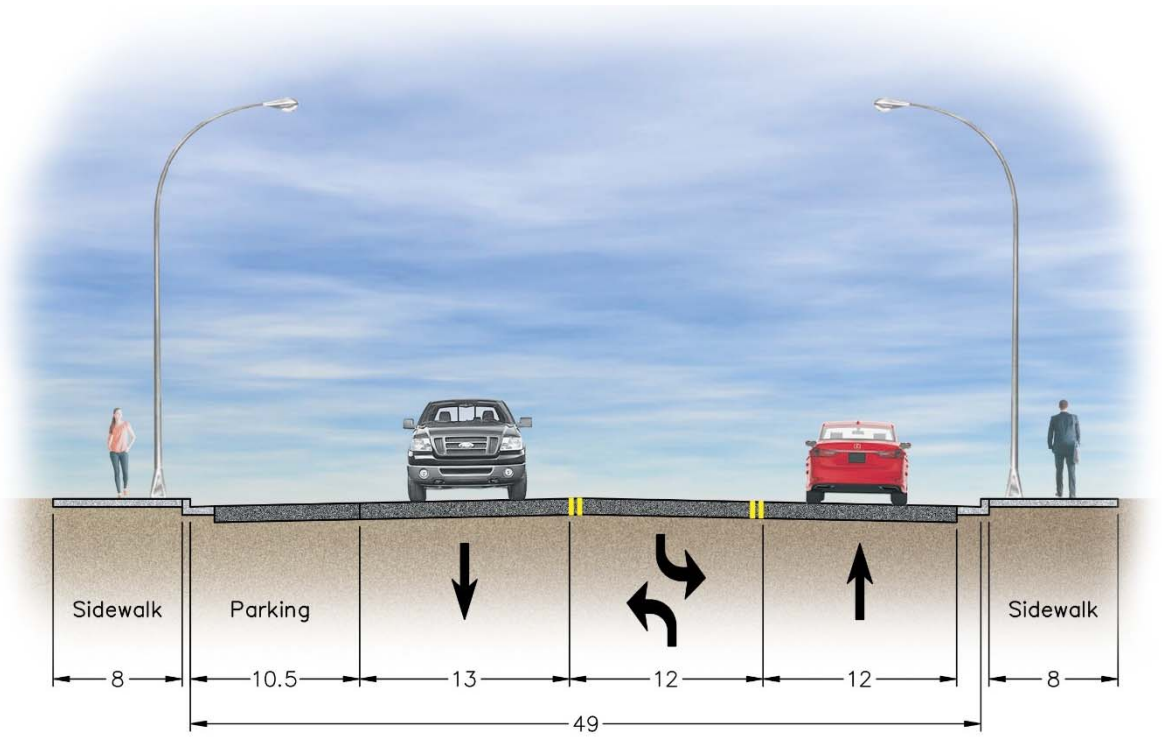


TABLE V-6: SCORING SUMMARY FOR DO-NOTHING ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

	VEHICULAR	PEDESTRIAN	BICYCLE	SCORE
OPERATIONS	TWLTL allows for efficient access into driveways and at key intersections.	No improvements to pedestrian facilities.	No improvements to bicycle facilities.	2
SAFETY	Vehicular safety remains unchanged. No improvements to address geometric crash potential.	No improvements to pedestrian safety.	No improvements to bicycle safety.	1
BUSINESS IMPACTS	No changes to the parking supply or ROW impacts.			4
COST	Only regular pavement maintenance required.			5

Three-Lane Section with Bulb Outs Roadway Alternative

This alternative would reduce the through lanes to 10.5-feet, with a 12-foot turn lane and two eight-foot parking lanes. At key intersections, bulb outs would be installed. There are no bicycle facilities; pedestrian facilities would be improved by relocating signs and lighting out of the walkways. This alternative would likely slow vehicle speeds and protect parked vehicles from crash potential, as well as reduce pedestrian crossing exposure, improving both vehicular and pedestrian safety. This alternative would improve on-street parking but require easements to relocate signs and lighting adjacent to business ROW, which would not negatively impact business operations. This alternative would be the second highest cost build alternative.

FIGURE V-13: THREE-LANE SECTION WITH BULB OUTS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE (AT INTERSECTION)

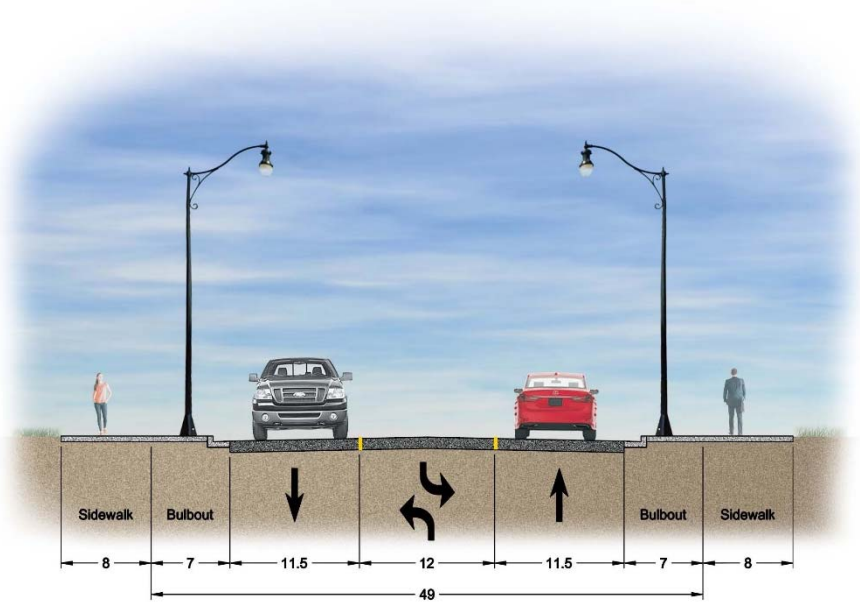
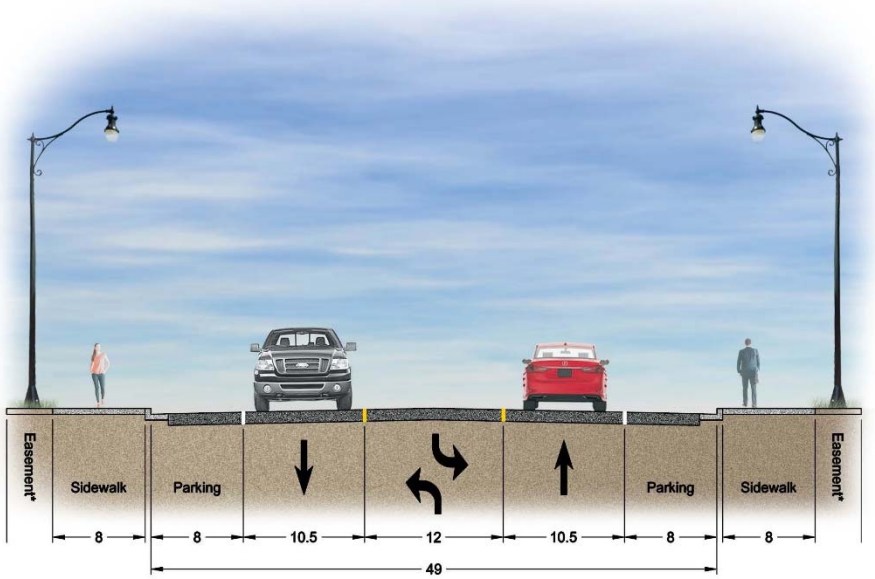


FIGURE V-14: THREE-LANE SECTION WITH BULB OUTS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE (BETWEEN INTERSECTIONS)



*Easement will be required for lighting and signs.

FIGURE V-15: CORRIDOR LAYOUT FOR THREE-LANE SECTION WITH BULB OUTS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

TABLE V-7: SCORING SUMMARY FOR THREE-LANE SECTION WITH BULB OUTS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

	VEHICULAR	PEDESTRIAN	BICYCLE	SCORE
OPERATIONS	TWLTL allows for efficient access into driveways and at key intersections.	Bulb outs improve pedestrian visibility, parking lane acts as buffer and lighting and signs relocated.	No improvements to bicycle facilities.	4
SAFETY	Vehicular safety improved with bulb outs to protect parked cars. Additional parking lane could increase crash potential. Narrower lanes and bulb outs will reduce crash severity.	Bulb outs reduce pedestrian exposure when crossing.	No improvements to bicycle safety.	4
BUSINESS IMPACTS	Additional on-street parking benefits business. Lights and signs will need to be relocated adjacent to business ROW.			4
COST	Costs include pavement markings, adding curb bulb outs, relocating lighting and signs and buying ROW easement for lighting and signs.			4

Two-Lane Section with Turn Lanes and Raised Medians Roadway Alternative

This alternative reduces the through lanes to 10-feet lanes, with a 10.5-foot left turn lane at key intersections. It features an eight-foot parking lane and six-foot raised median. This alternative would have minor impacts on vehicular operations due to circuitous routing, especially considering the alleyway configurations present along this section of the corridor. Pedestrian operations are improved with raised medians. As pedestrian refuge islands, they facilitate easier crossings of Sheyenne Street, and signs and lighting would be relocated out of walkways; there are no bicycle improvements. Raised medians at marked crosswalks reduce pedestrian crashes up to 46 percent by effectively reducing the crossing distance and exposure. For vehicles, raised medians reduce vehicle speeds and crash severity as well as reducing overall crash potential by 15 percent. The on-street parking supply is unchanged and signs would be relocated adjacent to business ROW. This would be the highest cost build alternative. Lighting could be relocated to the median, further increasing costs with this alternative.

FIGURE V-16: TWO-LANE SECTION WITH TURN LANES AND RAISED MEDIANS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

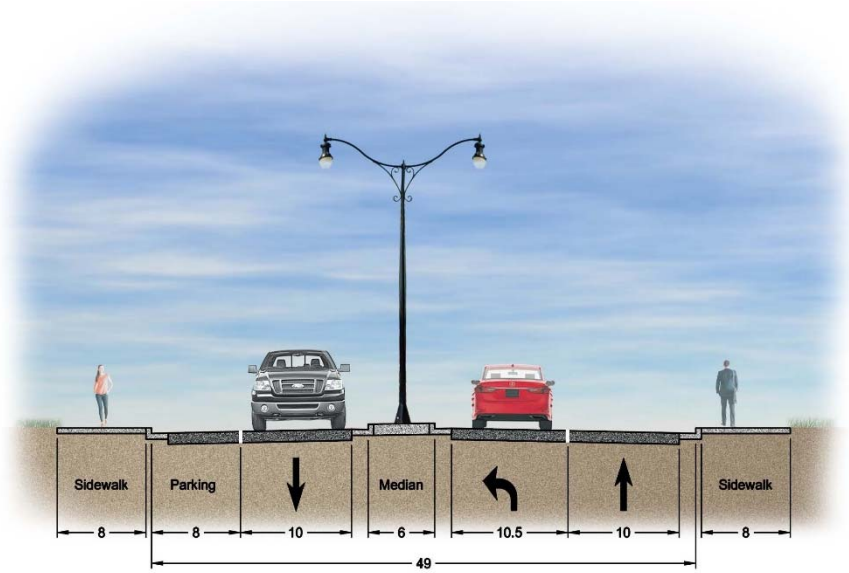


FIGURE V-17: CORRIDOR LAYOUT FOR TWO-LANE SECTION WITH TURN LANES AND RAISED MEDIANS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

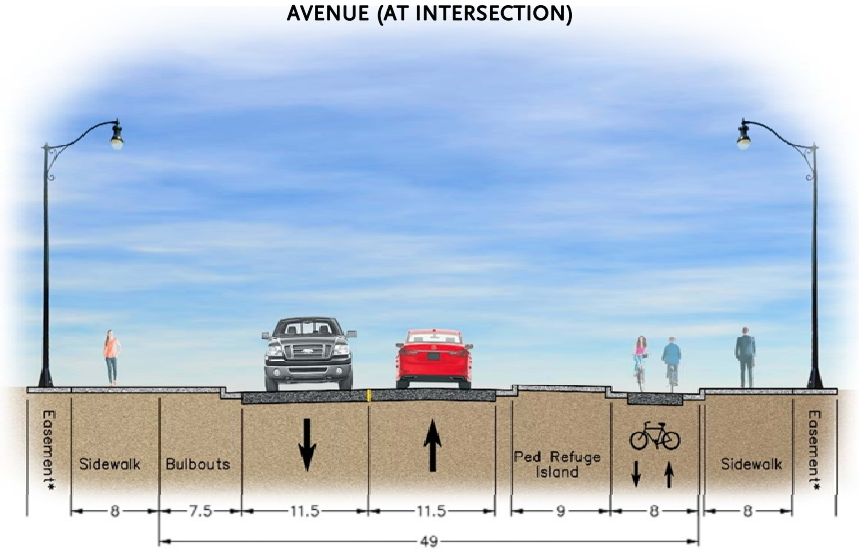
TABLE V-8: SUMMARY SCORING FOR TWO-LANE SECTION WITH TURN LANES AND RAISED MEDIANS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

	VEHICULAR	PEDESTRIAN	BICYCLE	SCORE
OPERATIONS	Turn lanes provided at key intersections, potential rerouting to access minor intersections and driveways. Lowered access risk.	Lights and signs would be relocated to the medians, improving pedestrian walk way. Medians facilitate crossings. No pedestrian buffer on east side of roadway.	No improvements to bicycle facilities.	4
SAFETY	Access management with medians reduces conflict potential. Narrower lanes and medians reduce crash severity.	Medians act as pedestrian refuges, facilitating safer and easier crossings.	No improvements to bicycle safety.	5
BUSINESS IMPACTS	No changes to the parking supply, most stringent access management alternative.			3.5
COST	Costs include pavement markings, adding medians, relocating lighting and signs and buying ROW easement for signs.			2.5

Separated Bicycle Lanes Roadway Alternative

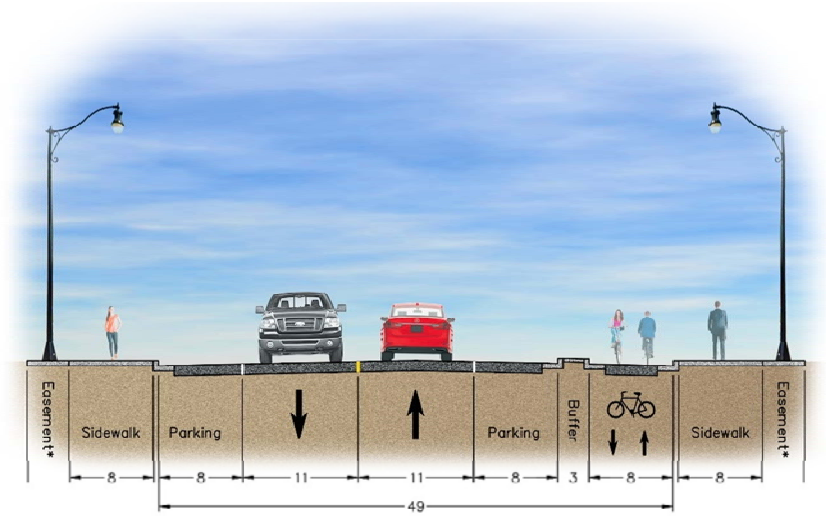
Between intersections, this alternative would feature two 11-foot through lanes, one in each direction but remove the two-way left-turn lane. It would add another lane of parking, for two eight-foot parking lanes, one on each side of the roadway. On the east side of the roadway, a three-foot raised median buffers the two-way separated bicycle lanes. At key intersections, through lanes are widened to 11.5-feet with a 7.5-foot bulb out on the west side and a nine-foot pedestrian refuge island on the east side.

FIGURE V-18: SEPARATED BICYCLE LANES ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE (AT INTERSECTION)



*Easement will be required for lighting and signs.

FIGURE V-19: SEPARATED BICYCLE LANES ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE (BETWEEN INTERSECTIONS)



*Easement will be required for lighting and signs.

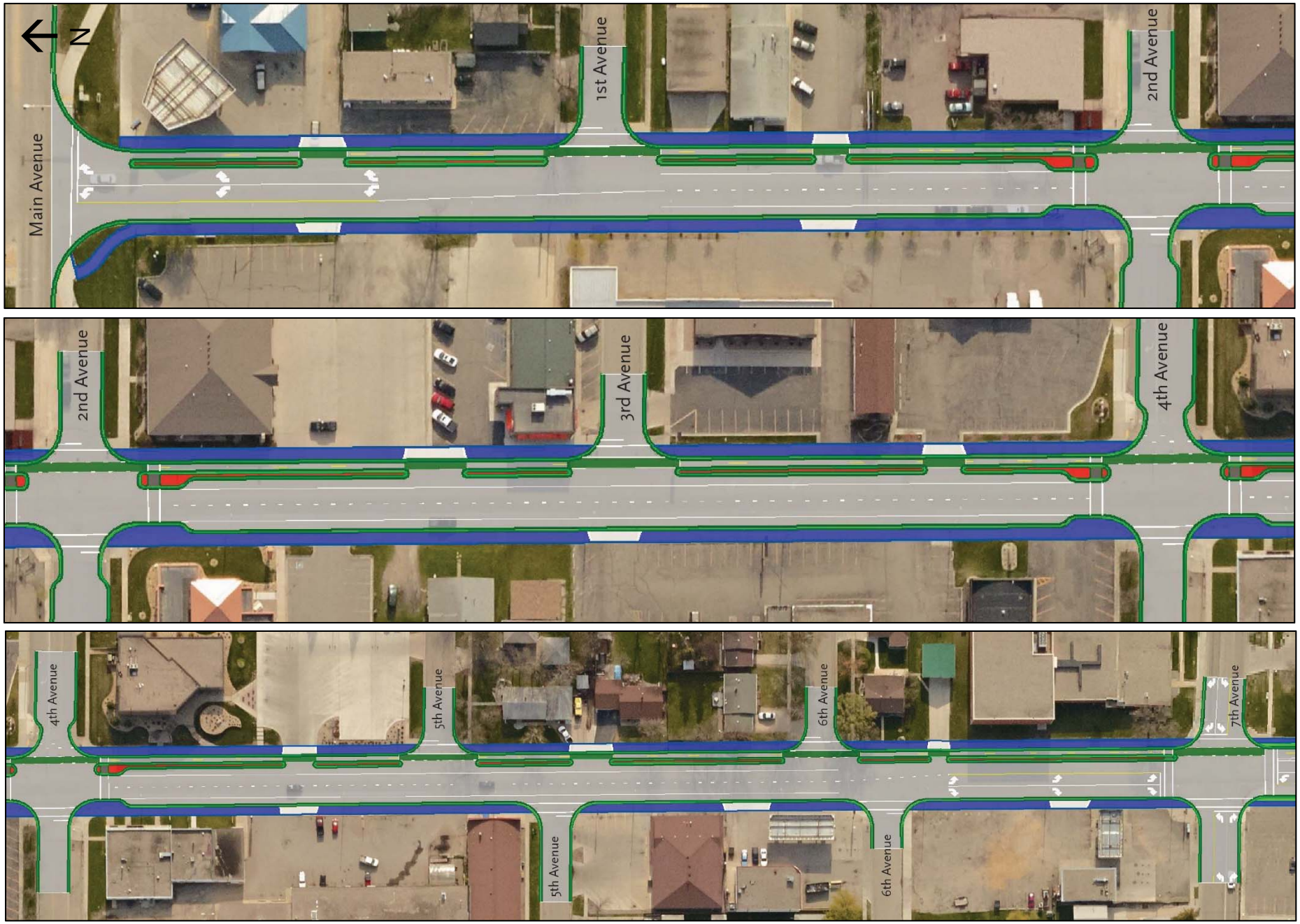
Without strict access management, vehicular operations and safety could suffer; however, pairing access management along with the traffic calming, provided by the narrowed lanes and pedestrian refuge island, would slow vehicles, reducing crash severity. As currently aligned, frequent driveways would slow or stop traffic while waiting to make left-turns, reducing vehicle operations. With this alternative, pedestrians would be buffered from vehicular traffic on both sides and reduce pedestrian crossing exposure with medians and bulb outs at key intersections. Bicyclists would be provided their own protected space, improving bicycle safety and operations along the corridor. This alternative adds a lane of parking, protected by the median and bulb out at intersections, on the east side of the corridor, but does require lights and signs to be relocated adjacent to business ROW.

Bicycle lanes were also considered, but not carried forward. Minimal spacing between the parking and through lanes leaves bicyclists exposed to doors and traffic pressure, which is a major safety concern.

TABLE V-9: SUMMARY SCORING FOR SEPARATED BICYCLE LANES ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

	VEHICULAR	PEDESTRIAN	BICYCLE	SCORE
OPERATIONS	Removing TWLTL may hinder vehicle operations.	Lights and signs would be relocated. Separated bicycle lanes would buffer pedestrians on the east side of the road.	Bicyclists have dedicated facilities with direct access to downtown.	3.5
SAFETY	Narrower lanes reduce speed and crash severity. Removing TWLTL will increase crash potential.	Bulb outs and pedestrian refuge islands reduce crossing exposure.	Separated bicycle lanes removes cyclists from most conflicts, improving bicycle safety.	4
BUSINESS IMPACTS	Increased parking supply. Signs and lights would be relocated adjacent to business ROW.			4
COST	Costs include pavement markings, raised median and bulb outs, relocating lighting and signs and buying ROW easement for lighting and signs.			4

FIGURE V-20: CORRIDOR LAYOUT FOR SEPARATED BICYCLE LANES ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE



Other Roadway Alternatives

Two other roadway alternatives for Sheyenne Street from Main Avenue to 7th Avenue were developed but ultimately discarded.

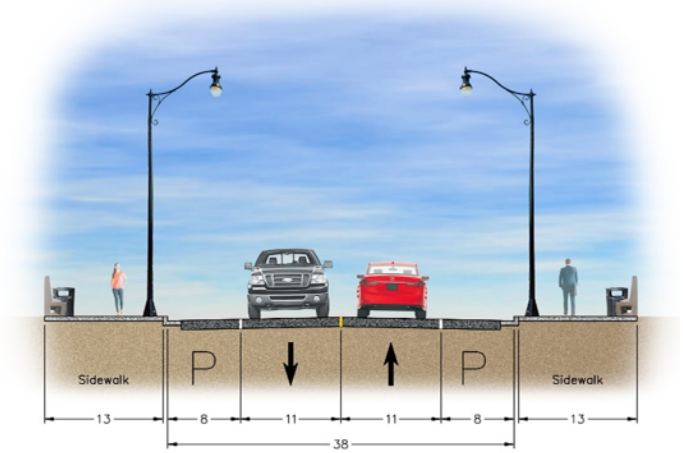
Extended Pedestrian Areas Roadway Alternative

This alternative removes the two-way left-turn lane and provides two lanes of parallel parking as well as adding five feet to each sidewalk. This alternative would likely have negative impacts on vehicle operations and safety. Pedestrian comfort and operations would be improved. The sidewalks would provide additional space for aesthetic improvements like street furniture and planters.

Reason Discarded

Ultimately, the negative impacts to vehicular operations, not providing any space for bicycles and relatively high cost for sidewalk improvements deemed it unfeasible and was not recommended.

FIGURE V-21: EXTENDED PEDESTRIAN AREAS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE



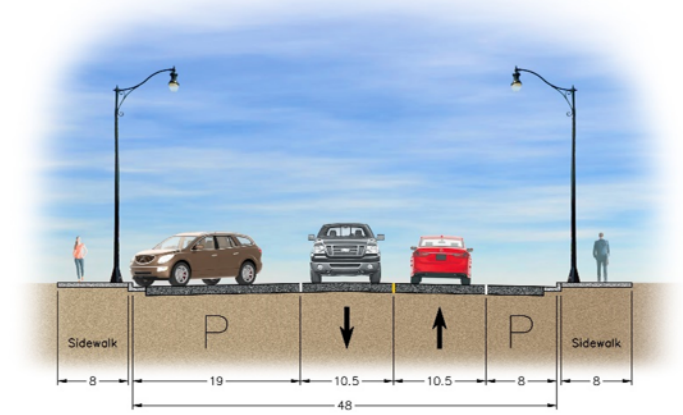
Maximum Parking Roadway Alternative

This alternative also removes the two-way left-turn lane to provide 60 degree angled parking on the west side of Sheyenne Street and one lane of parallel parking on the east side. This alternative would have negative impacts on vehicular operations and safety with the removal of the two-way left-turn lane and addition of conflict potential from back-out angled parking.

Reason Discarded

With parking currently over-supplied along the corridor as well as negative impacts to vehicular operations and safety, this alternative was deemed unnecessary and was not recommended.

FIGURE V-22: MAXIMUM PARKING ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE



*Easement will be required for lighting and signs.

Summary of Roadway Alternatives for Sheyenne Street from Main Avenue to 7th Avenue

The three build alternatives all scored extremely close and any could be implemented and be expected to improve safety and multimodal appeal of the corridor. The scoring criteria involved quantitative data, applied in a qualitative fashion. This, in combination with the close scoring results means that any of the three alternatives could be prioritized, depending upon the scorer. Thus, detailed stakeholder involvement will be key in deciding the final cross-section.

A summary table for the Do-Nothing alternative and the three build alternatives is presented in Table V-10.

Public Comments Received

A variety of written comments were received after Public Input Meeting #2 that supported the Three-Lane Section with Bulb Outs and Two-Lane Section with Turn Lanes and Raised Medians alternatives. Additional support was received for the Separated Bicycle Lanes, but as a future alternative when bicycle demand necessitates it.

TABLE V-10: SUMMARY OF ROADWAY CROSS-SECTION ALTERNATIVES FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

Alternative	Operations		Safety		Business		Cost	Score
	Vehicular	Pedestrian and Bicycle	Vehicular	Pedestrian and Bicycle	Parking	ROW Impacts		
Do-Nothing Roadway Alternative	TWLTL allows for more efficient access into driveways and at key intersections.	No improvements to multimodal facilities.	Vehicular safety remains unchanged. No improvements to address operational or geometric crash potential.	Pedestrian, bicycle and transit safety remains unchanged.	No changes to parking supply.	No ROW impacts.	Only regular pavement maintenance required.	12
	Operations Score: 2		*Safety Score: 1*		*Business Impact Score: 4*		*Cost Score: 5*	
Three-Lane Section with Bulb Outs Roadway Alternative	TWLTL allows for more efficient access into driveways and at key intersections.	Bulb outs improve pedestrian visibility. Lighting and signs relocated outside pedestrian space. Parking lane improves comfort by acting as a buffer. No bicycle operations improvements.	Vehicular safety improved with bulb outs to protect parked cars. Additional parking lane could increase crash potential. Narrower lanes and bulb outs will reduce speed and crash severity.	Bulb outs reduce exposure at intersections, facilitating easier and safer crossings of Sheyenne Street. No bicycle safety improvements.	Additional on-street parking provided is benefit to businesses.	Lights, signs will need to be relocated adjacent to business ROW to provide acceptable pedestrian crossing width.	Costs include pavement markings, adding bulb outs at intersections, relocating lighting and signs and buying ROW easement for lights and signs.	16
	Operations Score: 4		*Safety Score: 4*		*Business Impact Score: 4*		*Cost Score: 4*	
Two-Lane Section with Turn Lanes and Raised Medians Roadway Alternative	Turn lanes provided at key intersections, requires rerouting to access minor intersections and driveways.	Lights and signs would be relocated to the medians, improving the sidewalk space. No improvements to bicycle facilities. No pedestrian buffer on east side of road.	Access management and with turn lanes improve vehicular safety. Traffic calming will reduce crash severity.	Medians act as pedestrian refuge islands, facilitating easier and safer crossings of Sheyenne Street.	No changes to the parking supply. Most stringent access management alternative.	Signs would be relocated adjacent to business ROW to provide acceptable pedestrian crossing width.	Costs include pavement markings, constructing medians, relocating lighting and signs and buying ROW easement for signs.	15
	Operations Score: 4		*Safety Score: 5*		*Business Impact Score: 3.5*		*Cost Score: 2.5*	
Separated Bicycle Lanes Roadway Alternative	Removing TWLTL may hinder vehicle operations.	Dedicated, buffered space for cyclists that would connect to a planned future shared-use path to 52nd Avenue. Separated bicycles lanes and on-street parking act as buffer for sidewalks, improving pedestrian comfort.	Narrower lanes, raised medians and bulb outs will reduce speed and crash severity. Removing TWLTL will increase crash potential.	Separated bicycle lanes remove cyclists from most conflicts, improving bicycle safety.	Additional on-street parking provided is benefit to businesses.	Lights, signs should be relocated adjacent to business ROW to improve pedestrian amenities.	Costs include pavement markings, constructing medians and bulb outs, relocating lighting and signs and buying ROW easement for lights and signs.	15.5
	Operations Score: 3.5		*Safety Score: 4*		*Business Impact Score: 4*		*Cost Score: 4*	

Score 1-5; 5 is best, 1 is worst

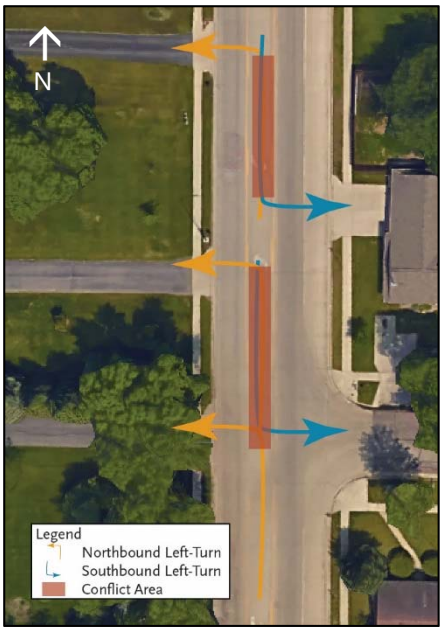
Note: all alternatives would include spot specific improvements for traffic control, access management.

Sheyenne Street from 7th Avenue to 13th Avenue

The section of Sheyenne Street from 7th Avenue to 13th Avenue is very different than the section of Sheyenne Street from Main Avenue to 7th Avenue. It is entirely residential with even denser spaced driveways. Since most access points serve single family homes, conflict potential is very low. To consolidate or relocate these driveways would likely require buyouts, which is financially restrictive, and given low conflict potential, unnecessary. Alternatives were developed with the following assumptions:

- There are no capacity needs; one lane in each direction is sufficient for current and projected traffic volumes, including all redevelopment scenarios.
- There are no major safety needs. There were no crashes reported for any intersections between 7th Avenue and 13th Avenue; additionally, there were very few segment crashes in this section.
- Traffic control will be required at 7th Avenue with all redevelopment scenarios.
- Existing grassy boulevards provide an excellent buffer for pedestrian comfort.
- There are no key pedestrian crossing locations included in this section of Sheyenne Street.
- There is very little parking demand for existing on-street parking. Most residential parking occurs either in driveways or on side streets.
- The needs for this section of Sheyenne Street require balancing access points and multimodal facilities.
- Access. On the west side of Sheyenne Street in this section are densely spaced residential driveways with very low volumes. On the east side of Sheyenne Street are roadways with higher traffic counts, serving multiple residences. While the center left-turn lane removes conflicts from the through lanes, the negatively offset driveways and streets result in many head-on conflict points (Figure V-23).
- By 2020, there will likely be bicycle facilities along Sheyenne Street from 13th Avenue to 40th Avenue, sometime after 2020, bicycle facilities will connect all the way down to 52nd Avenue.

FIGURE V-23: CONFLICT AREAS WITH LEFT-TURN LANE AND OFFSET LEFT-TURNS



Scoring was completed for just three categories: operations, safety and cost. Refer to Table V-5 on Page V-15 for details about the scoring. A score of five represents the best possible score, with a score of one representing the worst score.

Do-Nothing Roadway Alternative

This alternative would not require any geometric changes, leaving the roadway with a 12- and 13-foot through lane with a 12-foot turning lane and 10.5-foot parking lane. There are no bicycle facilities; sidewalks are provided on both sides of Sheyenne Street with a grassy boulevard. Pedestrian facilities provide good connectivity north and south but there are no dedicated crossing locations outside of 7th Avenue and 13th Avenue. There are no bicycle facilities. This alternative does not enhance vehicular, pedestrian, bicycle or transit safety. This alternative has a low cost, as likely only regular maintenance would be necessary.

FIGURE V-24: DO-NOTHING ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM 7TH AVENUE TO 13TH AVENUE

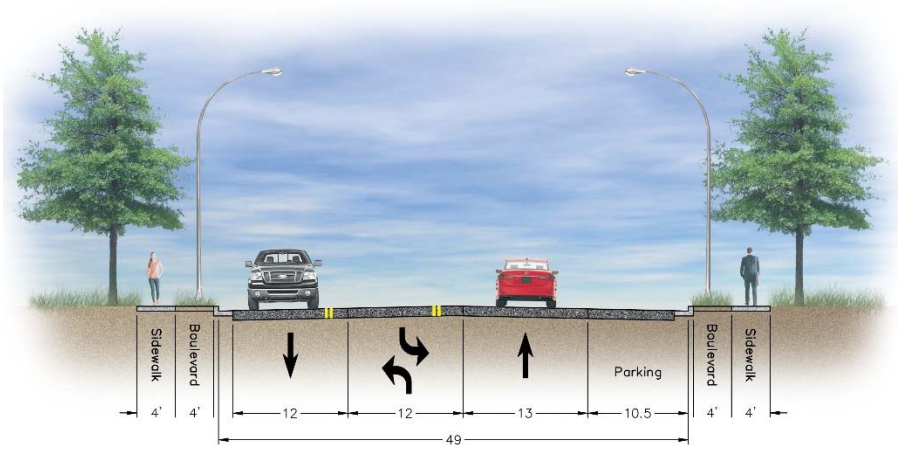


TABLE V-11: SCORING SUMMARY FOR DO-NOTHING ROADWAY ALTERNATIVE FOR SHEYENNE STREET BETWEEN 7TH AVENUE AND 13TH AVENUE

	VEHICULAR	PEDESTRIAN	BICYCLE	SCORE
OPERATIONS	TWLTL allows for efficient access into driveways and at key intersections.	No pedestrian deficiencies identified.	No improvements to bicycle facilities.	3
SAFETY	No vehicular safety issues identified.	No pedestrian safety issues identified.	No improvements to bicycle safety.	3
COST	Only regular pavement maintenance required.			5

Two-Lane Section with Turn Lanes and Raised Medians

This alternative reduces the through lanes to 11.5-foot lanes, with a 12-foot left-turn lane at key intersections. It removes on-street parking to implement an eight-foot median. This alternative would potentially have minor negative impacts to vehicle operations associated with circuitous routing to access the residential driveways. Pedestrian operations are improved with raised medians; there are no bicycle operations improvements. Vehicular and pedestrian safety is improved with medians, particularly issues with the turn bays at the negatively offset left-turn lane are resolved. This would be the highest cost build alternative.

FIGURE V-25: CORRIDOR LAYOUT FOR TWO-LANE SECTION WITH TURN LANES AND RAISED MEDIANS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM 7TH AVENUE TO 13TH AVENUE

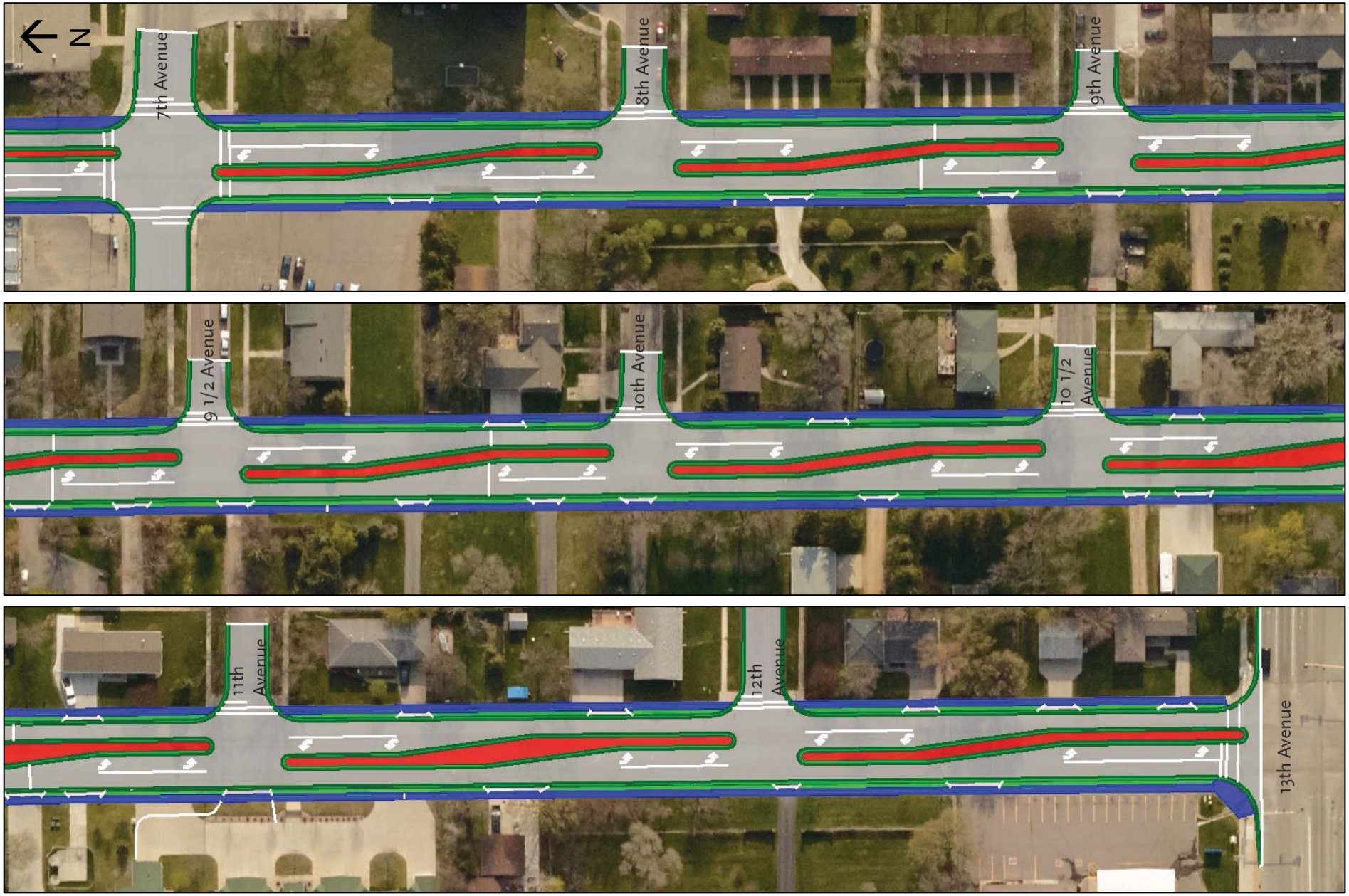


FIGURE V-26: TWO-LANE SECTION WITH TURN LANES AND RAISED MEDIANS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM 7TH AVENUE TO 13TH AVENUE

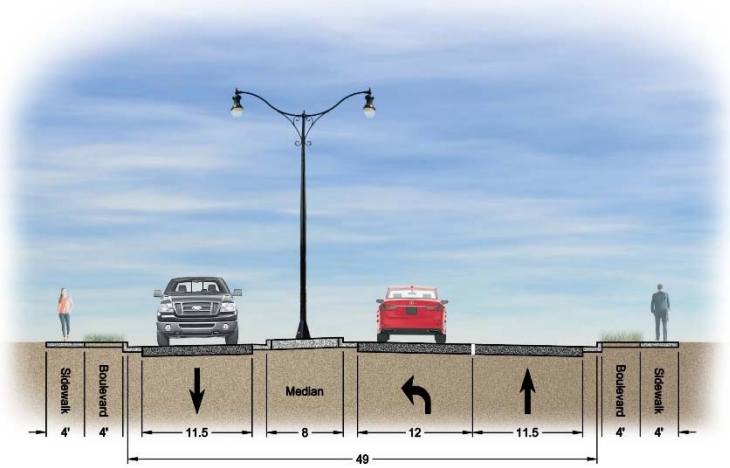


TABLE V-12: SCORING SUMMARY FOR TWO-LANE SECTION WITH TURN LANES AND RAISED MEDIANS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM 7TH AVENUE TO 13TH AVENUE

	VEHICULAR	PEDESTRIAN	BICYCLE	SCORE
OPERATIONS	Turn lanes provided at key intersections. Rerouting to access driveways.	Medians can facilitate pedestrian crossings.	No improvements to bicycle facilities.	4
SAFETY	Access management with medians reduces conflict potential. Eliminate potential for head on collisions in left-turn lanes.	Medians act as pedestrian refuges, facilitating safer and easier crossings.	No improvements to bicycle safety.	5
COST	Costs include pavement markings and constructing medians.			2.5

Separated Bicycle Lanes Roadway Alternative

This alternative would feature one 11-foot through lane in each direction and a 12-foot two-way left-turn lane. On-street parking is removed; on the east side of the roadway a 10.5 foot two-way separated bicycle lane with three-foot buffer. Vehicular operations would continue to operate as they currently do; pedestrian operations would remain unchanged. Narrower lanes may reduce vehicle speeds resulting in reduced crash severity; pedestrian safety remains unchanged. Bicyclists would be provided their own protected space, improving bicycle safety and operations on the corridor. This would be the lowest cost build alternative.

FIGURE V-27: SEPARATED BICYCLE LANES ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM 7TH AVENUE TO 13TH AVENUE

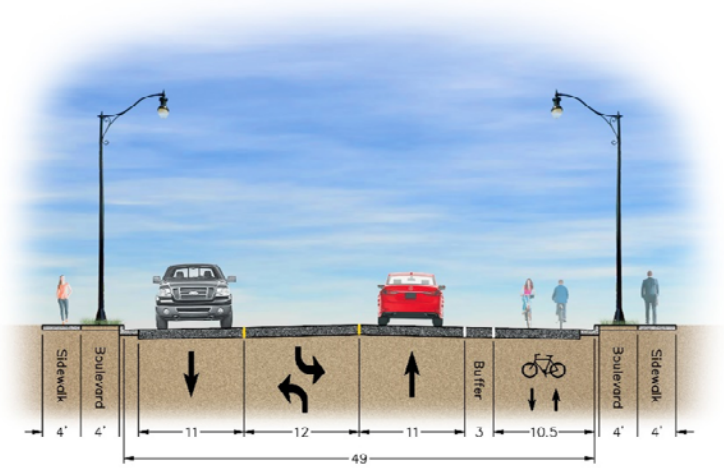


TABLE V-13: SCORING SUMMARY FOR SEPARATED BICYCLE LANES ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM 7TH AVENUE TO 13TH AVENUE

	VEHICULAR	PEDESTRIAN	BICYCLE	SCORE
OPERATIONS	TWLTL allows for efficient access into driveways and at key intersections.	No pedestrian deficiencies identified.	Bicyclists have dedicated facilities with direct access to downtown.	5
SAFETY	Narrower lanes reduce speed and crash severity.	No pedestrian safety deficiencies identified.	Separated bicycle lanes remove cyclists from most conflicts, improving bicycle safety.	3
COST	Costs include pavement markings.			4

FIGURE V-28: CORRIDOR LAYOUT FOR SEPARATED BICYCLE LANES ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM 7TH AVENUE TO 13TH AVENUE

Other Roadway Alternatives

Other alternatives were preliminarily analyzed but discarded:

- **On-Street Bicycle Lanes.** On-street bicycle lanes include bicyclists on both sides of the street. The proposed bicycle facility north of 7th Avenue is a separated bicycle lane facility on the east side of the street; south of 13th Avenue, a shared-use path is present on the east side of the street. Bicycle lanes would require crossing the street multiple times in a half mile, which is impractical.
- **Bulb Outs.** Although bulb outs could be easily implemented if parking is to be maintained on the east side of the roadway, there are no clear pedestrian crossing locations. It is undesirable to implement pedestrian crossings with markings, signs and bulb outs if crossing volumes are low. This will breed motorist non-compliance at a location where pedestrians will expect traffic to yield.
- **Increased Parking.** Currently, the parking along this section of the corridor is rarely used, apart from a few cars a day. Thus, adding parking is not necessary.
- **Improved Pedestrian Facilities.** The current pedestrian facilities provide adequate buffer and spacing to be attractive for pedestrians, thus, no consideration was given to adjusting the sidewalks.

Summary of Roadway Alternatives for Sheyenne Street between 7th Avenue and 13th Avenue

The scoring analysis indicates that the two build alternatives and Do-Nothing score very close. Because a consistent experience along Sheyenne Street from Main Avenue to 13th Avenue is very important, the cross-section recommended for Sheyenne Street from Main Avenue to 7th Avenue will influence the cross-section recommended for this segment of Sheyenne Street. As noted earlier, rigorous stakeholder involvement is required to make the final determination of preferred cross-section.

Access Management Plan

Access management balances the needs of the roadway with needs to access property. However, densely spaced access points, like currently along Sheyenne Street, introduce conflict and friction into the traffic stream, resulting in safety, operational and aesthetic deficiencies. Access management plans were developed only for the No Redevelopment Scenario. Any proposed redevelopment scenario will be held to the same or more stringent access management techniques.

Alternatives developed for Sheyenne Street will be scored and ranked based on the access risk calculation:

1. Access points are translated into conflict points. For example, a full intersection has 32 conflict points, while a right-in/right-out intersection has just three conflict points.
2. Assign the following conflict potential:
    - Category 1: Residential Property
    - Category 2: Commercial Property or Local Roadway
    - Category 3: Functionally Classified Roadway
3. Multiply conflict points by conflict potential to get access risk.

Alternatives are presented below.

Access Management Alternatives for Sheyenne Street between Main Avenue and 7th Avenue

Three alternatives were developed for Sheyenne Street between Main Avenue and 7th Avenue. Each alternative is specifically compatible with roadway alternatives discussed above.

Do-Nothing Access Management Alternative

This alternative would not close or relocate any access points. With 37 access points, including Main Avenue and 7th Avenue, access related crashes would likely continue to be a major factor in the crash potential along the corridor.

The access risk calculated for this alternative is highest of the three alternatives at 905. This alternative would be compatible with only the Do-Nothing Roadway Alternative.

Access Management without Medians Alternative

This alternative would remove redundant access points and align remaining accesses, as possible, for just 19 total access points on Sheyenne Street from Main Avenue to 7th Avenue. The side street and alleyway configurations provide additional access points with limited impacts to traffic flow.

The access risk calculated for this alternative is 20.6 percent lower than the Do-Nothing Access Management Alternative at 719. This alternative would be compatible with the following roadway alternatives:

- Three-Lane Section with Bulb Outs Roadway Alternative
- Separated Bicycle Lanes Roadway Alternative

This access management alternative would support two roadway build alternatives. Fewer curb cuts on the sidewalks means greater ease of traveling for pedestrians with disabilities and fewer access points means less opportunities for drivers to interfere with bicycle facilities.

Access Management with Medians Alternative

This alternative maintains 26 access points, but converts 17 of them to right-in/right-out only. Again, the side street and alleyway configurations provide additional access points with limited impacts to traffic flow.

The access risk calculated for this alternative is 42.8 percent lower than the Do-Nothing Access Management Alternative at 518. This access management alternative is only compatible with the Two-Lane Section with Turn Lanes and Raised Medians Roadway Alternative.

Summary of Access Management Alternatives for Sheyenne Street between Main Avenue and 7th Avenue

The Access Management with Medians Alternative provides the lowest access risk but is only compatible with the Two-Lane with Turn Lanes and Raised Median Roadway Alternative, which is not likely to be favorable to the general public due to the circuitous routing required. This combination of access management and roadway design would likely provide the most aesthetically appealing set of alternatives, with opportunities for additional greenspace and removing clutter from the sidewalk by placing streetlights in the median.

The Access Management without Medians Alternative reduces access risk and provides the fewest access points along the corridor, which would better support pedestrian and bicycle operations. These access management alternatives will be refined with property owners along the corridor, especially where parking is impacted or where shared access points are shown. The specific components of these agreements are beyond the scope of this report but should be pursued during later stages of the project. Technically, the alternatives are prioritized and shown in Table V-14.

TABLE V-14: SUMMARY OF ACCESS MANAGEMENT ALTERNATIVES FOR SHEYENNE STREET BETWEEN MAIN AVENUE AND 7TH AVENUE

Alternative	Access Risk	Risk Reduction
Access Management With Medians	518	42.8%
Access Management Without Medians	719	20.6%
Do-Nothing	905	0%

Summary of Public Comments

A variety of public comments were received after Public Input Meeting #2 regarding access revisions to their properties along the corridor. They acknowledged that ease of access is critical to the continued success of their business.

FIGURE V-29: EXISTING ACCESS POINTS ON SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

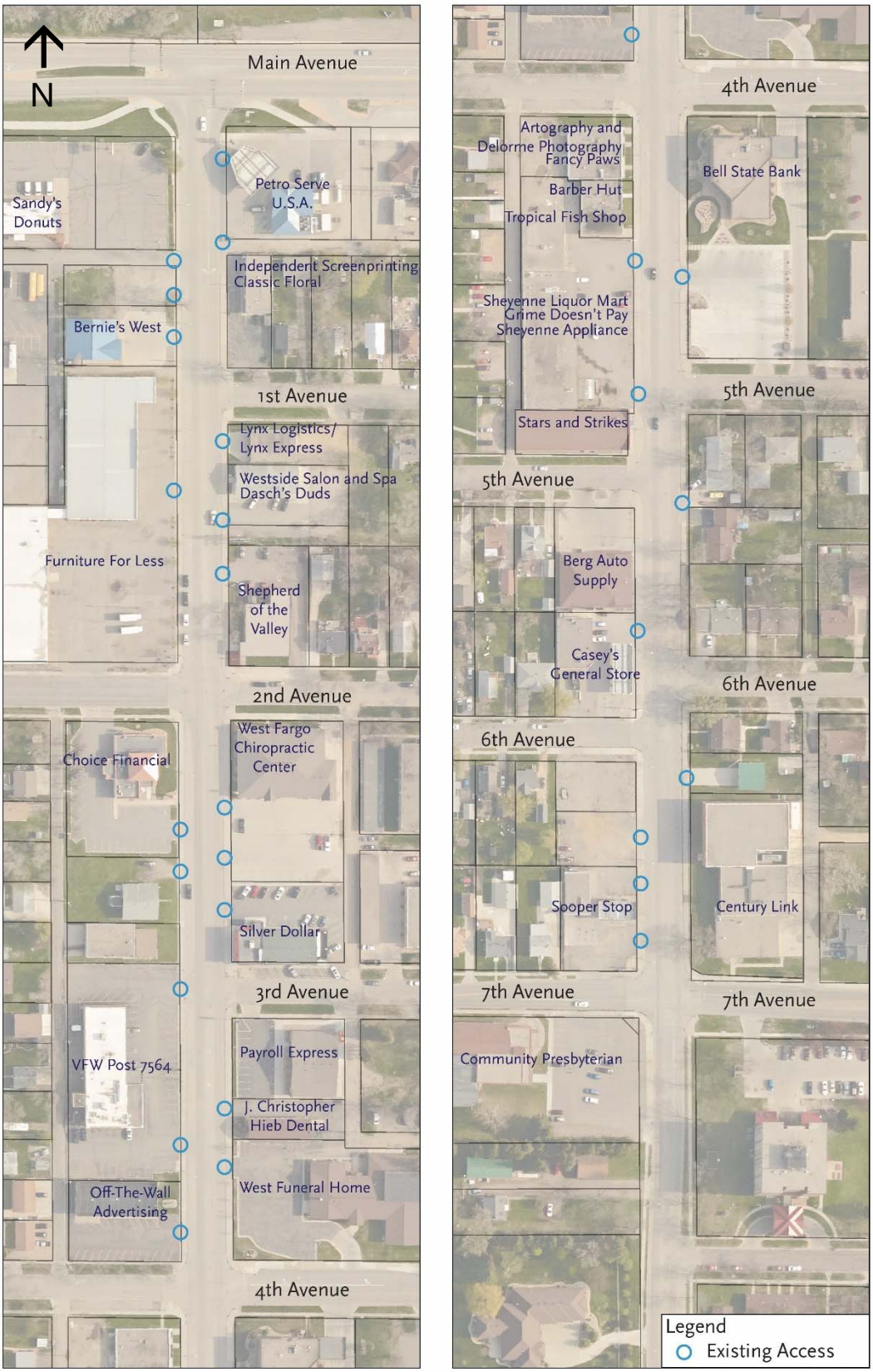


FIGURE V-30: ACCESS MANAGEMENT WITHOUT MEDIANS ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

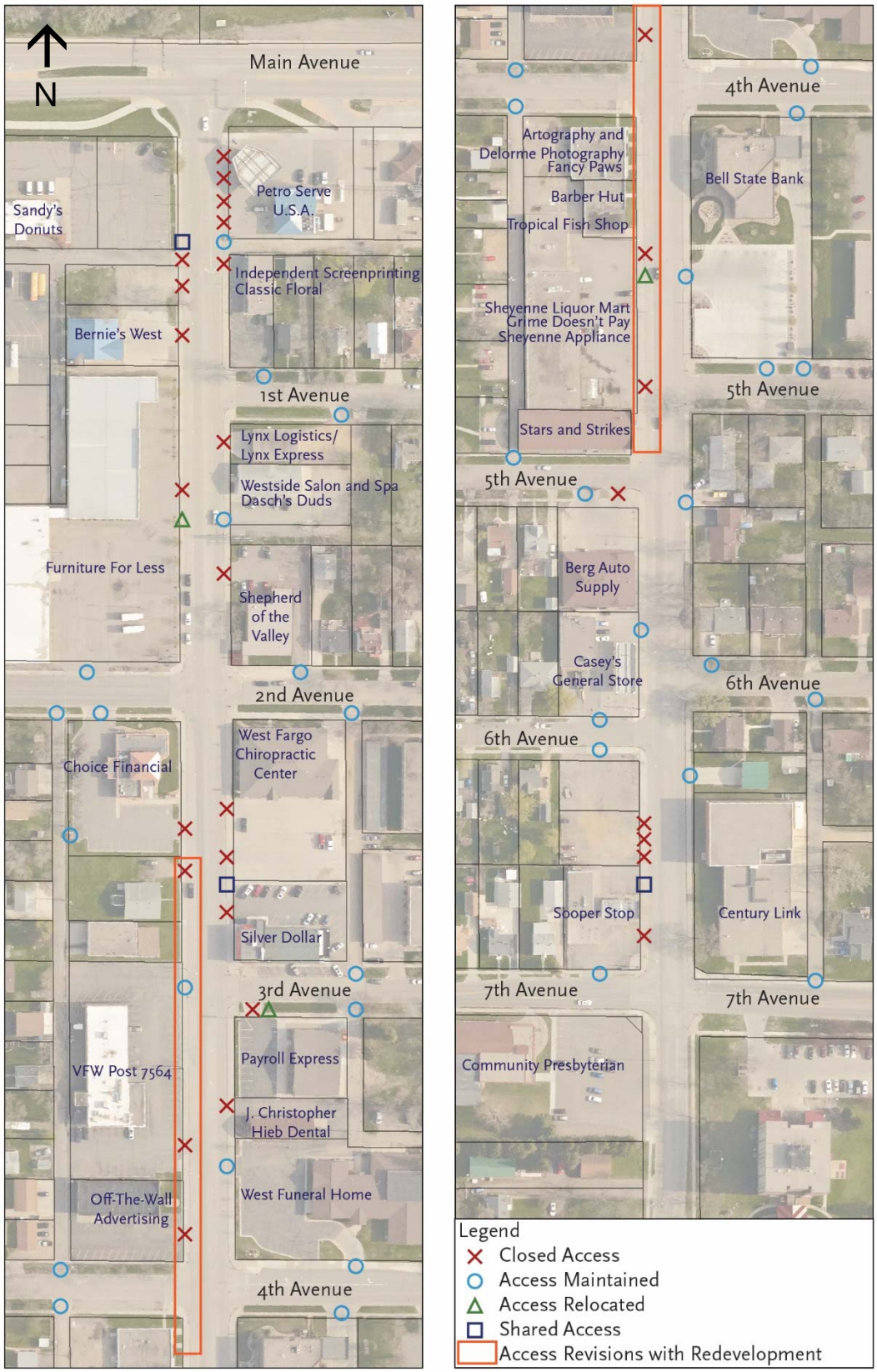
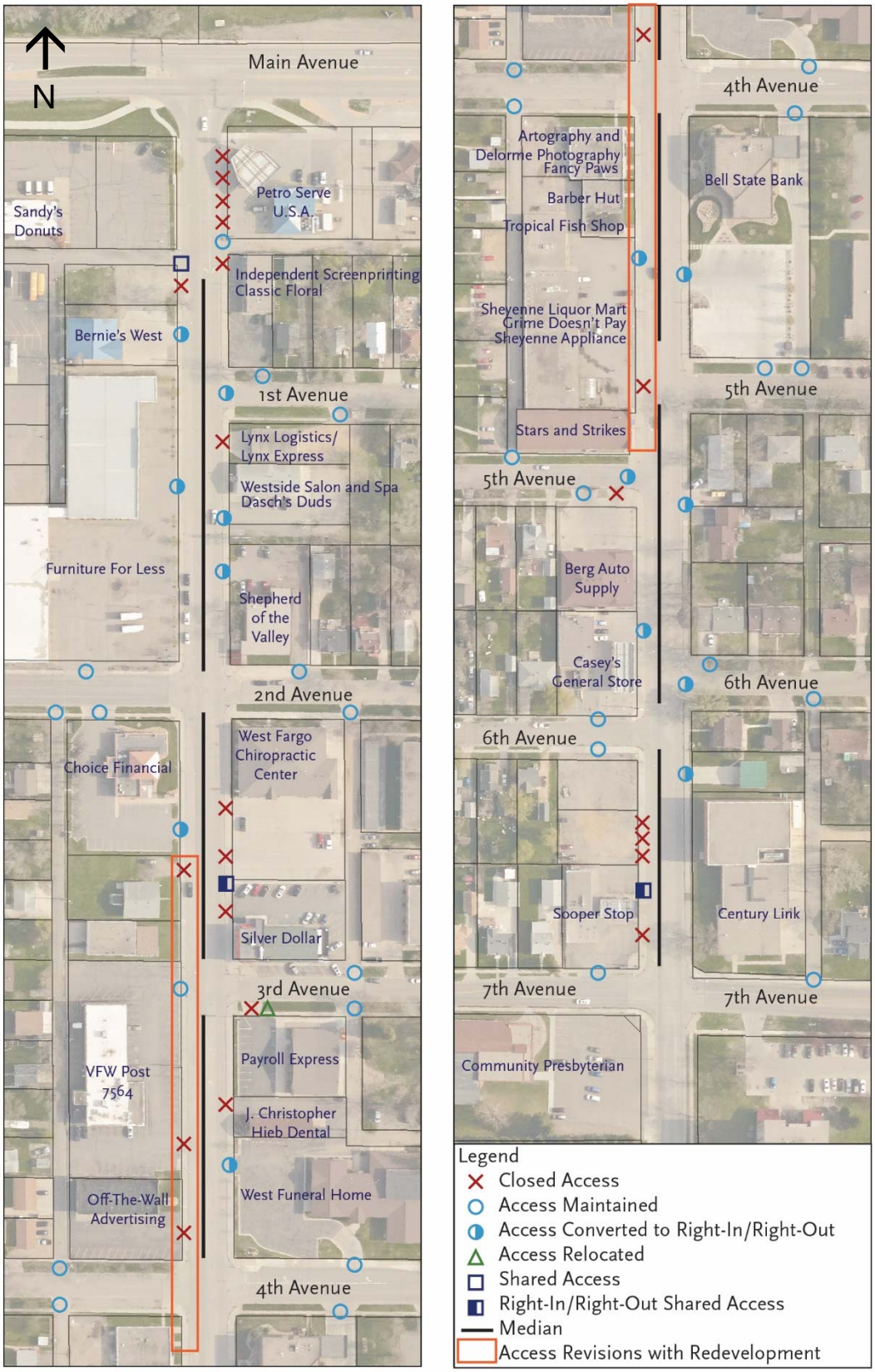


FIGURE V-31: ACCESS MANAGEMENT WITH MEDIANS FOR SHEYENNE STREET BETWEEN MAIN AVENUE AND 7TH AVENUE



Access Management Alternatives for Sheyenne Street between 7th Avenue and 13th Avenue

Due to the nature of many of the access points, driveways to single family homes with no redundant access, there are limited improvements that can be made; they are discussed below. Both access management alternatives will be scored using the access risk approach, detailed on Page V-33.

Do-Nothing Access Management Alternative

This alternative would not change any of the 33 access points, including 7th Avenue and 13th Avenue. The access risk for this alternative is 773. This alternative would be compatible with the following roadway alternatives:

- Do-Nothing Roadway Alternative
- Separated Bicycle Lanes Roadway Alternative

Consideration should be given to the potential negative effects not changing access points along this corridor would have on the build alternative.

Access Management with Medians Alternative

This alternative would install medians, effectively converting all but nine access points into right-in/right-out accesses. Vehicles traveling to-and-from these accesses would have to use U-turn maneuvers at the median curb cuts if they needed to make a left-turn. This circuitous routing may be unnecessary and create more conflicts on a roadway where most of the access points serve single family residential properties with very low traffic.

The access risk for this alternative is 586, a reduction of 24.2 percent. This alternative would only be compatible with the Two-Lane Section with Turn Lanes and Raised Median Roadway Alternative.

Summary of Access Management Alternatives for Sheyenne Street between 7th Avenue and 13th Avenue

While the Access Management with Medians Alternative does reduce access risk 24.2 percent, the circuitous routing for primarily residential properties will likely face strong criticism from the public. Furthermore, with few crash trends in this part of the corridor related to access risk, changes to the existing network may be unnecessary. This alternative would need to be refined with the public. Technically, the alternatives are prioritized in Table V-15.

TABLE V-15: SUMMARY OF ACCESS MANAGEMENT ALTERNATIVES FOR SHEYENNE STREET BETWEEN 7TH AVENUE AND 13TH AVENUE

Alternative	Access Risk	Risk Reduction
Access Management With Medians	586	24.2%
Do-Nothing	773	0.0%

FIGURE V-32: EXISTING ACCESS POINTS ON SHEYENNE STREET FROM 7TH AVENUE TO 13TH AVENUE

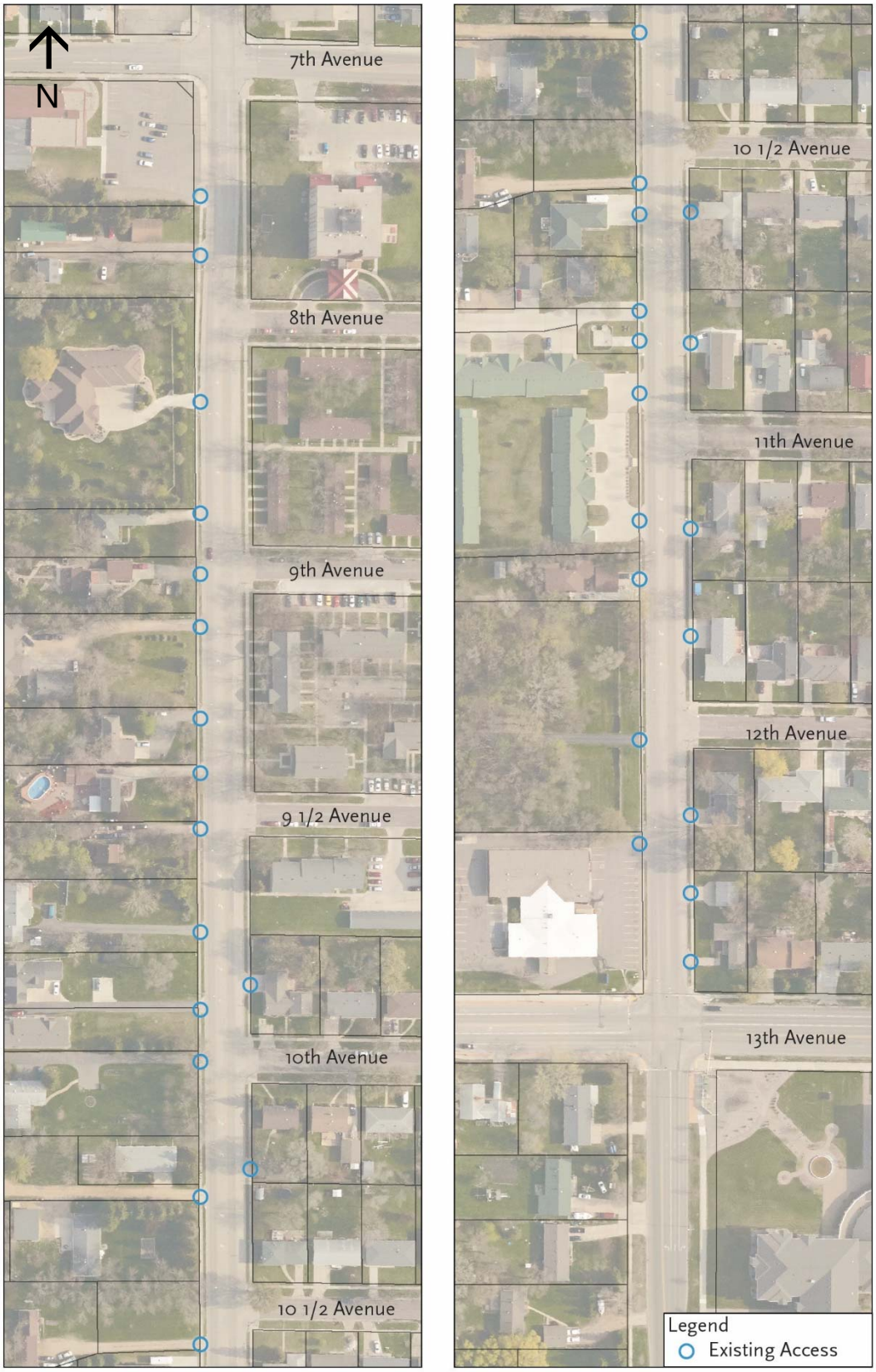
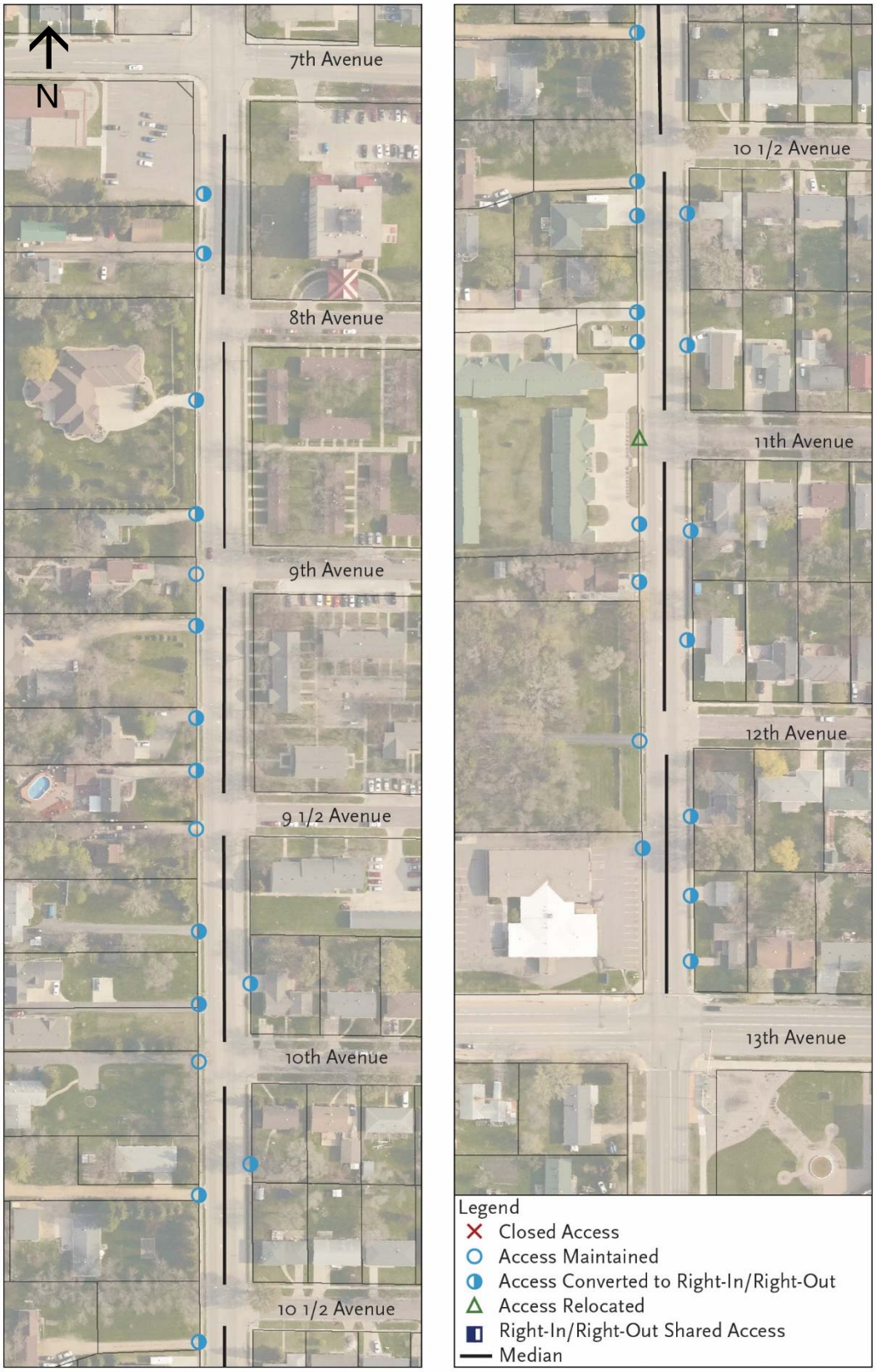


FIGURE V-33: ACCESS MANAGEMENT WITH RAISED MEDIANS ALTERNATIVE



Parking Improvements

Changes to parking supply and demand can be accomplished in a variety of ways, but all parties need to be invested in its success; the city cannot make wholesale changes to the ordinances without understanding the needs of the community and businesses cannot change the development style and parking provision without flexibility from the city. Changing parking provision needs to be done in a way that supports the vision for downtown: will the area be a traditional downtown with a strong multimodal corridor where vehicle needs are secondary to pedestrian, bike and transit needs or will the area develop as a suburban town center where vehicles are the dominant part of the transportation network and dictate what and where multimodal facilities are included. Improvement strategies discussed here, in addition to ideas presented in the Chapter IV) Redevelopment Scenario Analysis, will provide a variety of solutions to support any vision the downtown develops. Moving forward, it will be important to develop strategies and ordinances the community can stand behind; with imminent redevelopment, continuity in character and infrastructure will be important.

Landscaping and Screening

As acknowledged many times throughout this study, parking is over supplied. Even without redevelopment, opportunities to improve how it looks and functions exist. Landscaping can improve the aesthetic value of parking lots by providing green space, defining pedestrian and vehicle spaces and reducing impervious surface, changing drainage requirements. Pedestrian scale landscaping in parking lots creates a more appealing streetscape and walking environment. West Fargo is already familiar with landscaping and screening ordinances; they are included in the Sheyenne Street Corridor Overlay zone.

FIGURE V-34: PARKING LOT SCREENING AND LANDSCAPING EXAMPLES

Fee-in-Lieu of Parking

Fee-in-lieu of parking would require developers to pay the city a set fee per space in lieu of providing the required number of parking spaces. The city would then provide and manage or facilitate other parking spaces available to the development. This option would not require the city to change the actual parking ordinances, just add language about this option. National research has found the average price of constructing one parking space is approximately $4,000; fee-in-lieu pricing would need to be set low enough to encourage developers to provide parking that meets their needs but high enough that it would discourage developers from not providing any parking at all.

Lacey, Washington, a suburb of Olympia with a population near 45,000, uses fee-in-lieu of parking development with the following language (Chapter 16.25.110 Off-street parking):

> *An owner/developer may elect to provide off-street parking by entering a voluntary agreement with the city to pay a fee-in-lieu of constructing or otherwise causing the provision of off-street parking facilities as provided for in LMC 16.25.110(A) and Chapter 16.72 LMC. Such contributions shall be at a rate as determined by the city engineer, adjusted annually by a construction cost price index. All contributions shall be deposited in a "downtown parking reserve fund." The fund shall be administered by the city and proceeds shall be used to further the objective of expanding the supply of off-street parking spaces and facilities.*
>
> *Priorities for construction of parking facilities shall be identified in a comprehensive parking plan and capital improvements program approved by the city council. The plan shall take into consideration the amount of available off-street parking within an area, the need for concentration of public parking facilities to prevent proliferation of private parking lots alternating with buildings, the visual and traffic impacts of parking areas or garages and the degree to which the parking areas or structures will encourage pedestrian circulation.*
>
> *All moneys voluntarily contributed by an owner/developer shall be spent or loaned by the city within twenty years on public parking areas or structures within the same CBD land use district from which the contribution originated.*

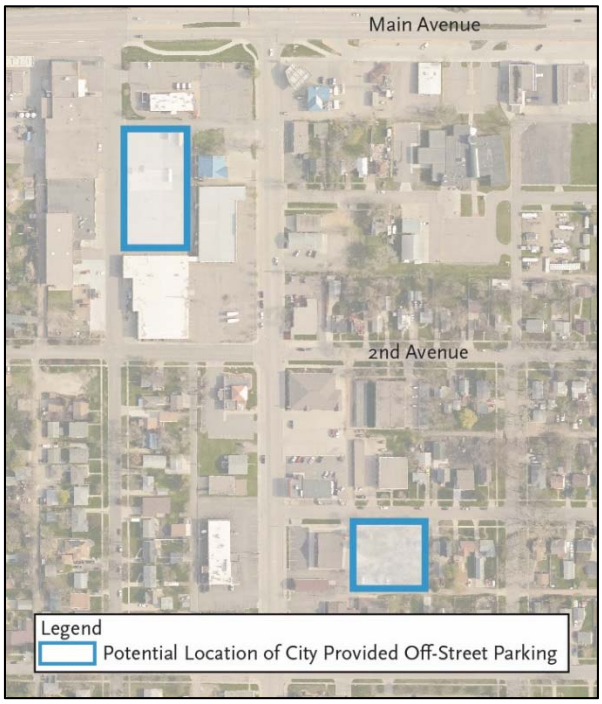
City Provided Off-Street Parking

There are multiple vacant parcels across the corridor that could be made available into city provided off-street parking:

- The large parking lot on the Sandy's Donuts, Bernie's West and Furniture for Less block.
- The vacant lot east of Payroll Express.

Both of these lots are currently or have previously been dedicated to parking. The city could take over funding and operation of these lots as a method to reduce parking lots directly on Sheyenne Street. Understanding financial constraints, this parking could be funded with a variety of strategies:

FIGURE V-35: POTENTIAL LOCATIONS FOR CITY PROVIDED OFF-STREET PARKING



- **Special assessments for business promotion.** The State of North Dakota permits special assessments to promote business activity or new business development. The creation of a special assessment district, alternatively known as a business improvement district, would assess a small amount to all properties, excluding residential properties, along Sheyenne Street. These funds would be able to be used to purchase, operate and maintain parking lots, as well as other aesthetic projects, if they could reasonably show that it supports business development or promotion.
- **Combined with the Fee-in-Lieu Parking ordinance.** Using fees collected from developers, the city could elect to purchase, operate and maintain city parking lots, again freeing up some amount of land for larger, denser developments.
- **Pay parking.** Like the City of Fargo, the City of West Fargo could operate pay lots in its downtown. Given the availability of other parking, this approach is likely to be less successful than others.

Shared Parking Arrangements

Shared parking arrangements are most successful in larger areas with varied land uses, very much like the West Fargo downtown now and even more as redevelopment occurs. These arrangements can be done privately when a developer comes to an agreement with a neighboring property owner with compatible land use or by the city during project development.

FIGURE V-36: FLYING PIG PROVIDED SIGNAGE FOR WEST FARGO CHIROPRACTIC TO FACILITATE SHARED PARKING

There are examples of locations where parking is currently shared across uses and owners:

- West Fargo Chiropractic Center and Flying Pig share parking after 6 P.M. on weekdays and all day on weekends. The West Fargo Chiropractic Center has 42 parking spaces in the lot adjacent to the Flying Pig, which provides 34 parking spaces. During the dinner hours, Flying Pig patrons regularly use the Chiropractic Center's parking lot. This arrangement was privately developed.
- The VFW and Off-The-Wall Advertising, Payroll Express and others. During special events at the VFW parking demand quickly exceeds supply. The many surrounding office properties do not require the use of their parking lot after 5 P.M., when all events occur.
- Mixed uses on the block between 4th Avenue West and 5th Avenue West, including Sheyenne Appliance, Sheyenne Liquor Mart, Stars and Strikes and others utilize one shared parking lot.

The City of Minneapolis has developed a process that begins in the project development phase with the zoning department. During the first meeting, the zoning administrator will calculate the reduction for shared land uses based on a formula established within the ordinance; if the land uses do not fit within the prescribed land uses, the developer can calculate their demand and request a reduction, subject to negotiation and approval. This arrangement, as written by the City of Minneapolis offers further reductions for a variety of characteristics, including bicycle parking and nearby transit facilities.

Shared parking is recommended in the existing Sheyenne Street Corridor Overlay District.

Changing the Parking Formula

More recently, downtown areas have focused on changing their parking formulas. Their approaches have ranged from reduced parking minimums, implementing parking maximums, offering reduction incentives or eliminating parking requirements all together.

Parking Minimums

Parking minimums were originally designed to prevent a free-rider problem. If developers were not forced to provide parking, they would not, meaning patrons to their development would use limited on-street parking or use other parking lots supplied by other developers. However, in this process parking minimums were developed so parking spaces were easy to find and near the destination.

Current parking requirements are listed at two spaces per 1,000 square feet for retail commercial uses and three per 1,000 square feet for service commercial, which has resulted in the oversupply of parking along the corridor. Reducing parking by as much as 40 percent for some uses would still provide ample parking along the corridor.

Parking Maximums

Parking maximum ordinances are typically found in larger cities' downtowns with stronger reliance on alternative modes of transportation. Parking maximums must be carefully constructed to minimize spill-over effects that may occur to neighborhood streets if parking is under supplied. The following are examples of how parking maximums have been applied across the country:

- Pittsburgh, Pennsylvania does not require any parking for the first 2,400 square feet of retail and service uses and then requires one off-street parking space per 175 feet at a maximum and one per 500 feet at a minimum. With this approach, a 5,000 square foot retail building could provide between six and 29 vehicle parking spaces.
- Helena, Montana requires 4.1 spaces per 1,000 square feet for retail uses, permitting up to 120 percent of the required parking spaces as the maximum parking allowed. With this approach, a 5,000 square foot retail building could provide between 21 and 26 vehicle parking spaces.
- Cambridge, Massachusetts limits the number of parking spaces based on geographic area as part of a travel demand management plan.

Reduction Incentives

Parking reduction incentives (or maximum increases) are often used as part of an environmental, aesthetic or multimodal plan. They are typically seen to promote a certain type of behavior or design. Examples of reduction incentives may include:

- Helena, Montana permits additional parking spaces if 20 percent of the parking lot is landscaped.
- Iowa City, Iowa permits a reduction of off-street parking spaces at a rate of one vehicle parking space per every seven bicycle parking spaces, with a limit of two vehicle parking spaces reduction.

Eliminating Parking Requirements

Alternatively, some cities have elected to let developers entirely determine what their parking needs are, only providing review and approvals throughout the zoning process. Madison, Wisconsin has taken this approach in their downtown district. All new developments must negotiate their preferred number of parking spaces with the planning administrator, as established by a transportation management ordinance. This approach would require thorough documentation and an increased effort by the planning staff as every new development within the downtown Sheyenne Street Corridor Overlay District would need review.

Changing the Parking Supply

Parking supply on Sheyenne Street is publically mandated through West Fargo's ordinances but privately supplied by developers and land owners. While changes and alternatives can be developed for currently supplied parking, the decision to implement these recommendations will be done privately, only to be facilitated or encouraged by the City of West Fargo.

In a city like West Fargo, where cars dominate the modal split, parking is imperative to support the growth and development of existing and new businesses along Sheyenne Street. The analysis presented in Chapter III) Existing Conditions Analysis found ample parking currently exists along the corridor. However, as redevelopment occurs,

introducing high density residential uses, and more retail, office and restaurant uses, parking demand will undoubtedly increase.

Providing enough parking will need to consider

- Compatible uses may facilitate shared parking or reduced parking needs. For example, a development that has mixed-use office and residential uses will find that the two uses require parking at different times of the day, the office uses during regular business hours and residential uses during nights and weekends.
- Distance. Research has found that individuals find up to 500 feet an acceptable distance to walk for parking. This means that a large parking lot at 1st Avenue could not reasonably be expected to service a development on 7th Avenue for day-to-day activities, which is more than 1,800 feet away.

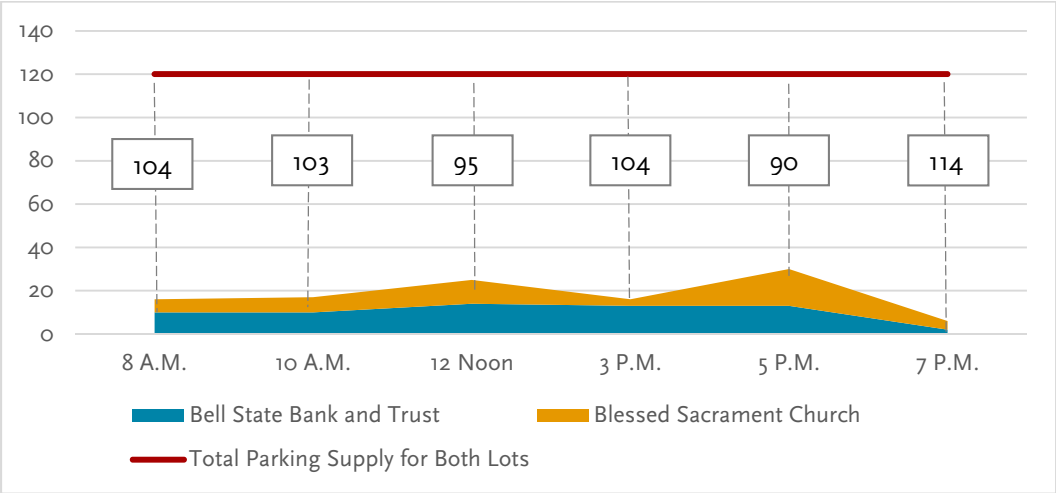
The following are ***examples*** of opportunities to eliminate excess parking and provide more developable land along the corridor, without negative impacts to the businesses. Many businesses are sensitive to reduced parking for fear of negative reactions from customers; however, property owners may benefit from reduced or shared parking arrangements through smaller maintenance costs or through the sale of the land. The City of West Fargo would also benefit from less parking in the form of more properties with a higher taxable use.

Block Between 4th Avenue East and 5th Avenue East

The two parcels on this block on the east side of Sheyenne Street have extremely complementing land uses.

- Blessed Sacrament Church has regular events on their current calendar at 6:30 P.M. with their highest parking demand on Sundays or special events, generally not during regular business hours.
- Bell State Bank and Trust's lobby is open from 7:30 A.M. until 6 P.M. on weekdays and from 9 A.M. until 1 P.M. on weekends. Their parking lot goes mostly unused outside these hours.

FIGURE V-37: PARKING SUPPLY AND DEMAND FOR BLOCK BETWEEN 4TH AVENUE EAST AND 5TH AVENUE EAST



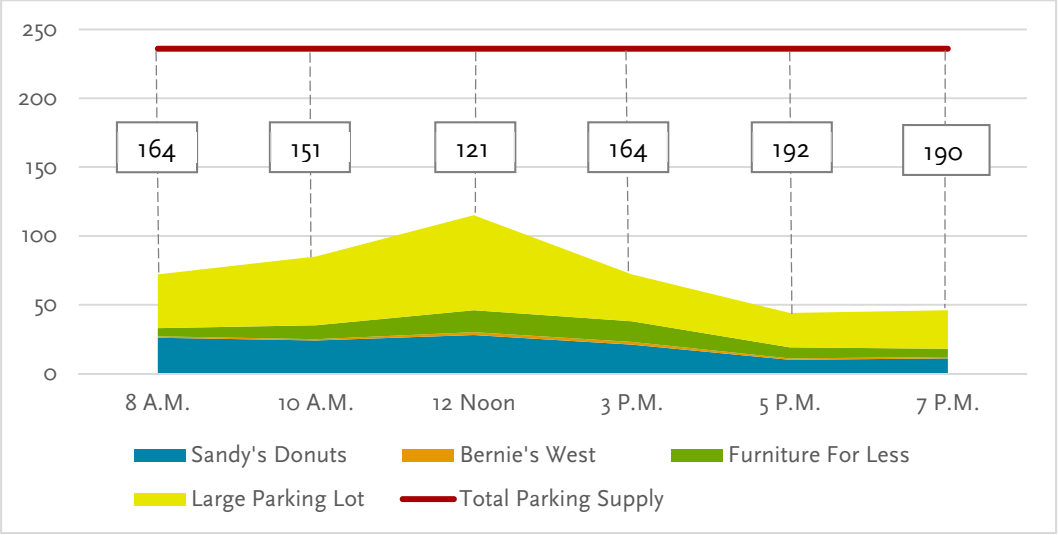
At no point during the parking study, did Bell State Bank and Trust's parking lot exceed 14 cars, approximately 42 percent utilized. By eliminating the south half of the parking lot, Bell State Bank and Trust would lose 17 parking spaces. This loss could be mitigated with approximately 12 shared parking spaces in the Blessed Sacrament Church parking lot, approximately 400 feet from the Bell State Bank and Trust front door, from the farthest parking space. The parking lot area, combined with the additional area from the closure of the low-volume 5th Avenue East, would open up 13,000 square feet for redevelopment. It is unlikely that a new development here would have negative impacts to Blessed Sacrament Church or Bell State Bank and Trust, nor would it impact street parking Blessed Sacrament uses along 5th Avenue East.

FIGURE V-38: EXAMPLE SHARED PARKING ARRANGEMENT FOR BLOCK BETWEEN 4TH STREET EAST AND 5TH STREET EAST

Block Between Main Avenue and 1st Avenue West

This block, on the west side of Sheyenne Street, is home to Sandys Donuts, Bernie's West, Furniture for Less and almost 240 parking spaces. Sandy's Donuts has 67 spaces, Bernie's West has room for 10, including the vacant adjacent lot, Furniture for Less has 60 spaces and the large parking lot on the west side of the block has 99 spaces. The large lot provides parking for WestGo Square, which includes TNT Diner and other varied uses like Go Far Events and Sunrise Sunset Daycare.

FIGURE V-39 PARKING SUPPLY AND DEMAND FOR BLOCK BETWEEN MAIN AVENUE AND 1ST AVENUE WEST



Even during the highest use period (12 Noon, attributable to Sandy's Donuts and TNT Diner's lunch rush), there were 121 parking spaces available. The large parking lot is a valuable location for parking: it is central for multiple uses like the WestGo Square, Sandy's Donuts and Bernie's West and it is not directly on Sheyenne Street, leaving valuable front-facing space for higher uses. This lot has nearly enough capacity to serve all uses on the block.

Opportunities to reduce parking on the front facing parking is available in three locations:

- **Combining the east part of the Sandy's Donuts Parking Lot and the Bernie's West Vacant Lot.** The highest weekday parking utilization at Sandy's Donuts was 28 vehicles, or about 42 percent. They currently provide 67 parking spaces. Removing 36 parking spaces would provide an additional 12,900 square feet of developable land. The vacant lot north of Bernie's West is often used for parking and it was included in the total parking spaces Bernie's West provides. At no time during the parking counts, weekday or weekend did Bernie's West exceed two vehicles. This can easily be accommodated within their existing paved parking lot. Combining this lot, with the east part of the Sandy's Donuts lot would provide a parcel of 20,500 square feet for redevelopment.
- **Southeast corner of Furniture for Less' Parking Lot.** The parking counts conducted for Furniture for Less, indicated peak demand at 16 vehicles; this lot currently provides 60 parking spaces. Reducing this by 42 spaces would free up approximately 20,000 square feet of expansion area, while still providing enough parking. Overflow street parking would be available for uncharacteristically high demand.

FIGURE V-40: EXAMPLE PARKING REDEVELOPMENT OPPORTUNITIES FOR BLOCK BETWEEN MAIN AVENUE AND 1ST AVENUE WEST

Reducing parking at these three locations would bring total supply to 152 spaces, meaning that even at the peak demand times there would still be 47 available off-street parking spaces. This action could result in two additional businesses along the corridor and another pedestrian amenity in the park/ green space.

Angled Parking

The proposed redevelopment has expressed interest in providing angled parking on the west side of Sheyenne Street. They have agreed to give up their own ROW to accommodate this element into their site plan. The city should consider a parking plan that would permit angled parking on the west side, encouraging redevelopment to conform by requiring ROW be provided. If future developments will not permit continuous angled parking, there should be continuity between developments. Angled parking should not be provided on one block and not the next. This parking plan would not permit angled parking on the east side of Sheyenne Street because existing buildings, not likely to change based on the Sheyenne Street/Main Avenue Framework Study, would prohibit a continuous provision of angled parking. Parallel parking would still be permitted.

Transit

Most of the Sheyenne Street study corridor currently has transit supportive densities, measured at seven dwelling units per acre or 25 jobs per acre, yet just one transit route with hourly service that only crosses the corridor. With redevelopment set to further increase transit supportive densities, and the surrounding existing environmental justice areas, improved transit service may be warranted.

Metro COG is in the process of updating the Metropolitan Transit Development Plan (TDP); however, there is no information from that plan available at the time this analysis was completed. For this reason, the 2012-2016 Metropolitan TDP was used. That plan recommended splitting the existing Route 16, operating on 7th Avenue, into two routes, 16 and 22.

The proposed Route 16 (shown in orange in Figure V-41) would make a loop on 13th Avenue, 8th Street, 7th Avenue and Sheyenne Street, effectively serving Sheyenne Street from 7th Avenue to 13th Avenue. The proposed Route 22 (shown in red in Figure V-41) would make a loop on 9th Street, Main Avenue, Sheyenne Street and 4th Avenue effectively serving Sheyenne Street from Main Avenue to 7th Avenue. This new alignment would serve all existing transit-supportive densities in the study area. The TDP identified benefits as more direct routes, easier to understand routing and serving currently unserved areas. It also recommended increasing service to 30-minute headways as ridership grows. This new routing alignment would serve almost 3,720 parcels, compared to around 3,440 parcels with the existing Route 16.

FIGURE V-41: PROPOSED TRANSIT ROUTES FROM 2012-2016 TRANSIT DEVELOPMENT PLAN

Truck Routes

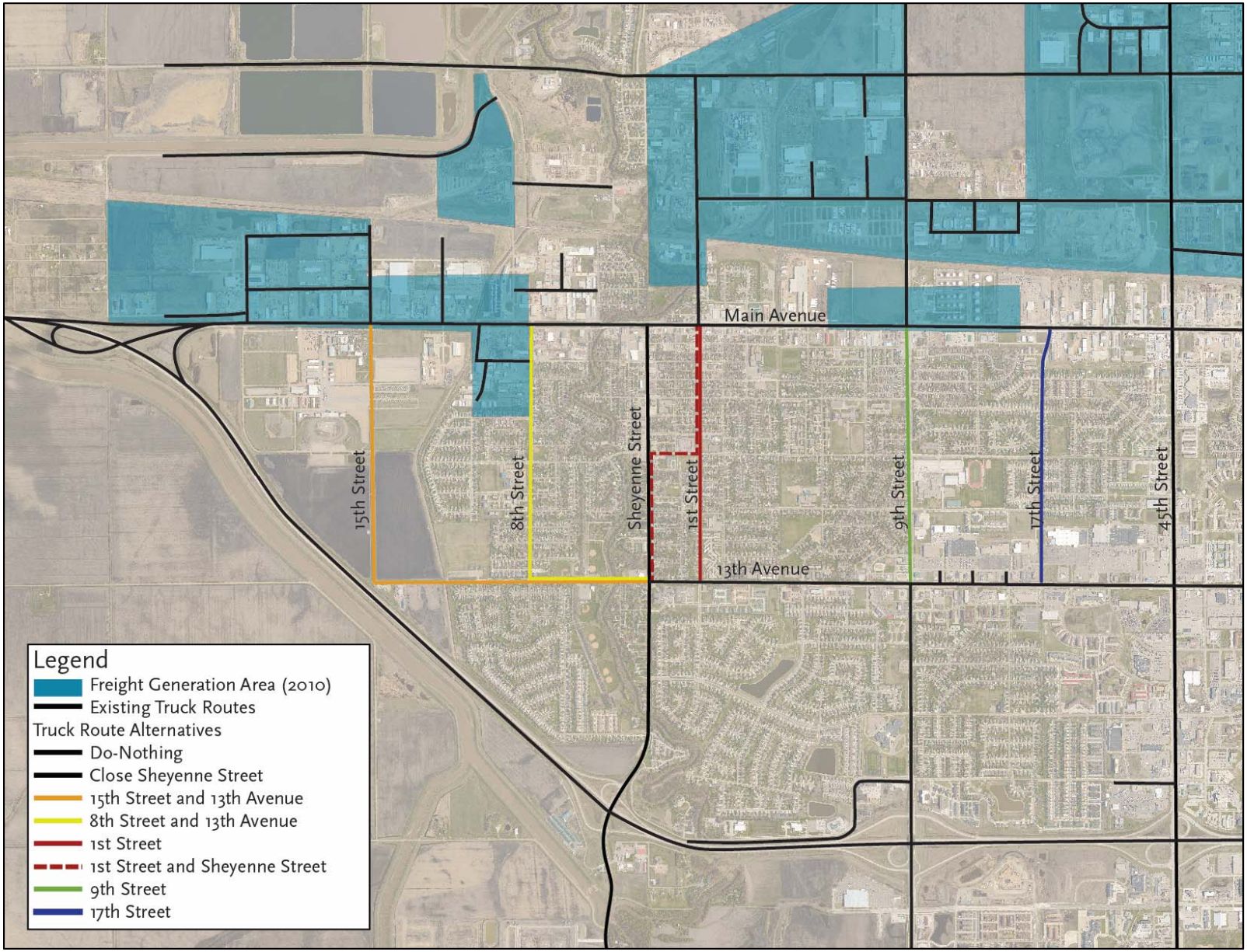
Sheyenne Street is a dedicated truck route, with truck traffic that varies throughout the year. Data collected during the summer of 2015, also construction season, showed more than 14 percent of total traffic on Sheyenne Street being heavy truck traffic (1,220 trucks). Data collected in mid-October by NDDOT showed just 4.2 percent of total traffic on Sheyenne Street being heavy truck traffic (325 trucks); the NDDOT counts also showed almost 800 vehicles fewer overall along the corridor, suggesting that construction related truck activity is a significant portion of Sheyenne Street traffic. Sheyenne Street is convenient for most of the industrial properties in West Fargo, located north of Main Avenue, with direct interstate access. However, the large trucks conflict with the desire to provide a safe, efficient multimodal corridor.

There are a variety of potential truck route alternatives, each with positive and negative features and impacts. The alternatives were scored quantitatively based on:

- **Convenience.** This was measured by the distance from Sheyenne Street, representing the rerouting required from the major freight generators to other locations within West Fargo. A score of five would represent alternatives still using Sheyenne Street, while a score of one would represent the greatest distance from Sheyenne Street. Areas of congestion and traffic control conductive to truck routing was also considered.
- **Land Use Impacts.** Certain land use types are generally not compatible with significant heavy truck traffic; this could include schools and high density residential.
    - » A score of five would represent industrial or commercial properties with limited pedestrian activity.
    - » A score of three would represent commercial properties with some pedestrian activity or multimodal facilities.
    - » A score of one would represent elementary schools, parks or other generators leading to strong pedestrian traffic.
- **Roadway Compatibility Costs**. Some roadways have characteristics that conflict with providing acceptable operations for heavy truck traffic which could include new bridges, not designed for heavy truck traffic, gravel road with spring weight limits, width of roadway and turning radii.
    - » A score of five is a roadway built for heavy truck traffic.
    - » A score of three is a roadway with weight restrictions but no or limited geometric issues.
    - » A score of one is a roadway with weight restrictions and significant geometric issues.

A map of the truck route alternatives is presented in Figure V-42. In depth analysis for an overpass over the interstate was not studied because the cost is too great, likely surpassing $10 million, for few trucks.

FIGURE V-42: TRUCK ROUTE ALTERNATIVES



Alternative Truck Routing

Do-Nothing Truck Route Alternative

This alternative would leave the official truck route on Sheyenne Street. This roadway would not change convenience, but would conflict with certain land uses like the proposed high-density redevelopment project and access to elementary schools and parks. Trucks have found the roadway facilities on Sheyenne Street to be adequate for their needs.

TABLE V-16: SCORING TABLE FOR DO-NOTHING TRUCK ROUTE ALTERNATIVE

Label	Description	Score
Convenience	Trucks have become accustomed to this route, central to many industrial properties, connection to interchange.	5
Land Use	Strong truck traffic is not compatible with a multimodal corridor in a downtown.	3
Roadway Compatibility	Trucks already use this roadway with limited issues. With certain improvements, navigating this corridor may become difficult.	5

Close Sheyenne Street to Truck Traffic Truck Route Alternative

This alternative would prevent truck traffic from using Sheyenne Street from Main Avenue to 13th Avenue, forcing them to choose one of the already designated truck routes throughout West Fargo and Fargo. Trucks could alternatively use the Main Avenue and I-94 interchange, 1.75 miles west, if they were traveling west or south or 45th Street, 2.0 miles east, if north or east. Both of these routes are already designated as truck routes so there would be limited land use impacts and roadway compatibility costs.

TABLE V-17: SCORING TABLE FOR CLOSE SHEYENNE STREET TO TRUCK TRAFFIC TRUCK ROUTE ALTERNATIVE

Label	Description	Score
Convenience	Trucks would be rerouted to existing routes, potentially at the Main Avenue and I-94 interchange and 45th Street.	1
Land Use	Existing routes already experience heavy truck traffic.	5
Roadway Compatibility	Trucks already use these roadway with limited issues. Any future improvements along these corridors will likely be designed for heavy truck traffic.	5

15th Street and 13th Avenue Truck Route Alternative

This alternative would shift the truck route to 15th Street and extend the currently designated truck route on 13th Avenue one mile to 15th Street. 15th Street is functionally classified as a minor arterial roadway, which currently experiences less than five percent truck traffic. This would be slightly more convenient than closing Sheyenne Street for southbound trucks and trucks coming from the recently expanded industrial park. The surrounding properties include the fairgrounds and some industrial development. During the Red River Valley Fair, this route would prove to be highly congested, reducing efficiency for truck traffic; however, during off-times there would be limited traffic on this roadway.

TABLE V-18: SCORING TABLE FOR 15TH STREET AND 13TH AVENUE TRUCK ROUTE ALTERNATIVE

Label	Description	Score
Convenience	Industrial properties west of Sheyenne Street would have better access to the route, but east of Sheyenne Street would face a longer reroute.	2
Land Use	Area surrounding this route is primarily industrial or vacant, but during special events congestion would be inconvenient for truck traffic. Future developments will likely be residential.	5
Roadway Compatibility	Truck traffic frequents roadway, likely capable of serving increased truck traffic but potentially not designed for heavy vehicles.	4

8th Street and 13th Avenue Truck Route Alternative

This alternative would shift the truck route to 8th Street and extend the currently designated truck route on 13th Avenue 0.45 miles to 8th Street. 8th Street is classified as a local collector and currently experiences around five percent truck traffic. From Main Avenue to 4th Avenue, the surrounding land use is primarily industrial uses with some residential uses, but from 4th Avenue to 13th Avenue, the surrounding land use is primarily residential and includes multiple parks and Westside Elementary School. Furthermore, as a two-lane local roadway, it is unlikely 8th Street was designed to accommodate truck traffic, supported by the median at the intersection of 8th Street and 13th Avenue that would be difficult for westbound right-turning trucks to navigate.

TABLE V-19: SCORING TABLE FOR 8TH STREET AND 13TH AVENUE TRUCK ROUTE ALTERNATIVE

Label	Description	Score
Convenience	Industrial properties west of Sheyenne Street would have better access to the route, but east of Sheyenne Street would face a longer reroute.	4
Land Use	Some industrial properties on the north end of 8th Street, but primarily parks and residential on south end of 8th Street.	3
Roadway Compatibility	Local Class 3 Roadway with 7.5 ton single axle weight limit. Also, medians and small intersections would prove difficult for truck traffic.	1

1st Street Truck Route Alternative

This alternative would shift the truck route from Main Avenue to 13th Avenue to 1st Street, 0.40 miles east of Sheyenne Street. 1st Street directly aligns with Center Street, the designated truck route north of Main Avenue, connecting to some of the most productive industrial properties in terms of truck traffic, but some rerouting would be required. 1st Street is a local road that is not designed for truck traffic, narrow intersections would likely prove difficult for trucks. 1st Street is surrounded by major pedestrian generators including South Elementary School and multiple parks as well as churches and medium to high density residential uses.

TABLE V-20: SCORING TABLE FOR 1ST STREET TRUCK ROUTE ALTERNATIVE

Label	Description	Score
Convenience	Aligns with Center Street, providing a direct connection from most industrial properties but does not directly connect to the interchange and unsignalized at 13th Avenue.	4.5
Land Use	Primarily residential with parks and an elementary school. Not compatible with surrounding land uses.	1
Roadway Compatibility	Local Class 3 Roadway with 7.5 ton single axle weight limit. Also, bulb outs and small intersections would prove difficult for truck traffic.	1

1st Street and Sheyenne Street Truck Route Alternative

This alternative would shift the truck route from Main Avenue to 7th Avenue to 1st Street, then use 7th Avenue to connect to Sheyenne Street from 7th Avenue to 13th Avenue. As noted in the 1st Street Truck Route Alternative, 1st Street aligns with Center Street, the designated truck route north of Main Avenue, but is surrounded by major pedestrian generators including South Elementary School, parks and churches. Furthermore, the local road design is not conducive to truck traffic.

TABLE V-21: SCORING TABLE FOR 1ST STREET AND SHEYENNE STREET TRUCK ROUTE ALTERNATIVE

Label	Description	Score
Convenience	Aligns with Center Street, providing a direct connection from most industrial properties with connection to Sheyenne Street interchange.	4.5
Land Use	Primarily residential with parks and an elementary school. Not compatible with surrounding land uses.	1
Roadway Compatibility	1st Street is Local Class 3 Roadway with 7.5 ton single axle weight limit. Also, bulb outs and small intersections would prove difficult for truck traffic.	1

9TH STREET TRUCK ROUTE ALTERNATIVE

This alternative would shift the truck route from Main Avenue to 13th Avenue one mile east to 9th Street. This route also aligns to truck routes north of Main Avenue and south of 13th Avenue. 9th Street is functionally classified as a minor arterial, currently experiencing around 2.0 percent truck traffic. This section of 9th Street is only a three-lane section and experiences heavy congestion during the peak hours. The surrounding land uses vary significantly; the north and south ends of this section of 9th Street are primarily commercial uses; however, West Fargo Public High School and residential uses are also prominent along the corridor. The design of this roadway would likely not pose problems for truck traffic since both Main Avenue and 13th Avenue have already been designed for truck traffic.

TABLE V-22: SCORING TABLE FOR 9TH STREET TRUCK ROUTE ALTERNATIVE

Label	Description	Score
Convenience	Provides excellent north-south connectivity to many industrial properties. Properties west of Sheyenne Street could use the Main Avenue and I-94 interchange. Significant congestion on this corridor.	2
Land Use	Primarily residential with West Fargo High School.	3
Roadway Compatibility	9th Street from Main Avenue to 13th Avenue is Local Class 3 Roadway with 7.5 ton single axle weight limit. Experiences heavy congestion during peak hours.	3

17TH STREET TRUCK ROUTE ALTERNATIVE

This alternative would shift the truck route from Main Avenue to 13th Avenue 1.5 miles east to 17th Street. 17th Street is classified as a local collector and experiences around one percent truck traffic. Again, 17th Street at Main Avenue and 13th Avenue are primarily commercial uses with residential uses in between. While the intersections at Main Avenue and 13th Avenue will be sufficient for truck traffic, the narrow and curved roadway of 17th Street will likely be difficult for trucks to navigate.

TABLE V-23: SCORING TABLE FOR 17TH STREET TRUCK ROUTE ALTERNATIVE

Label	Description	Score
Convenience	Does not provide improved connectivity and is unsignalized. 45th Street is nearby.	2
Land Use	Primarily residential with parks.	3
Roadway Compatibility	17th Street is a Local Class 3 Roadway with 7.5 ton single axle weight limit.	3

Summary of Truck Route Alternatives

Sheyenne Street is convenient and compatible for truck traffic, given its connection to the interchange and centrality to the major industrial properties in the city but it is not the most appropriate truck route given the downtown, multimodal corridor Sheyenne Street will become. However, there are no better alternative truck routes. As congestion builds, traffic calming techniques are implemented and growth on the south side of the city slows, so too will truck activity.

TABLE V-24: SUMMARY OF TRUCK ROUTE ALTERNATIVES

Label	Sheyenne Street	Close Sheyenne Street	15th Street	8th Street	1st Street	1st Street/ Sheyenne Street	9th Street	17th Street
Convenience	5	1	2	4	4.5	4.5	2	2
Land Use	3	5	5	3	1	1	3	3
Roadway Compatibility	5	5	4	1	1	1	3	3
Total Score	13	11	11	8	6.5	6.5	8	8

Closing Low Volume Roadways

FIGURE V-41: SIGNIFICANT ROADWAYS NOT ELIGIBLE FOR CLOSURE

Closing low volume roadways that feed Sheyenne Street has multiple benefits to the corridor, both operationally and aesthetically. Operationally, Sheyenne Street benefits from the closures by:

- **Reducing access points.** From Main Avenue to 7th Avenue there are 36 access points onto Sheyenne Street. As part of an access management strategy, closing low volume roadways can reduce access points that negatively impact traffic operations and pedestrian and bicycle safety.
- **Meeting signal warrants.** Closing low volume roadways will push vehicle traffic onto more important roadways like 4th Avenue and 7th Avenue, helping these intersections meet traffic control signal warrants.
- **Safety.** Access related crashes make up 80 percent of all crashes along the corridor.

Closing low volume roadways can have aesthetic and development benefits as well:

- **Parcel size.** The land area used for the roadways could be used to create larger parcels for redevelopment.
- **Green space.** Conversely, the land area used for the roadways could also be converted into small parks or green space. There are many parks surrounding the Sheyenne Street corridor, but none directly on the corridor.

Closing low volume roadways could potentially have negative impacts on pedestrian and bicycle users:

- **Limiting connectivity.** Creating large blocks can make it difficult for bicycles and pedestrians from the east or west to access Sheyenne Street. This could be mitigated with pedestrian/bicycle paths through large blocks.
- **Increase traffic on other roadways.** With fewer crossing locations, more drivers will be funneled to currently low volume roadways. While no significant impacts would be expected, even a slight increase in traffic may make some users uncomfortable.

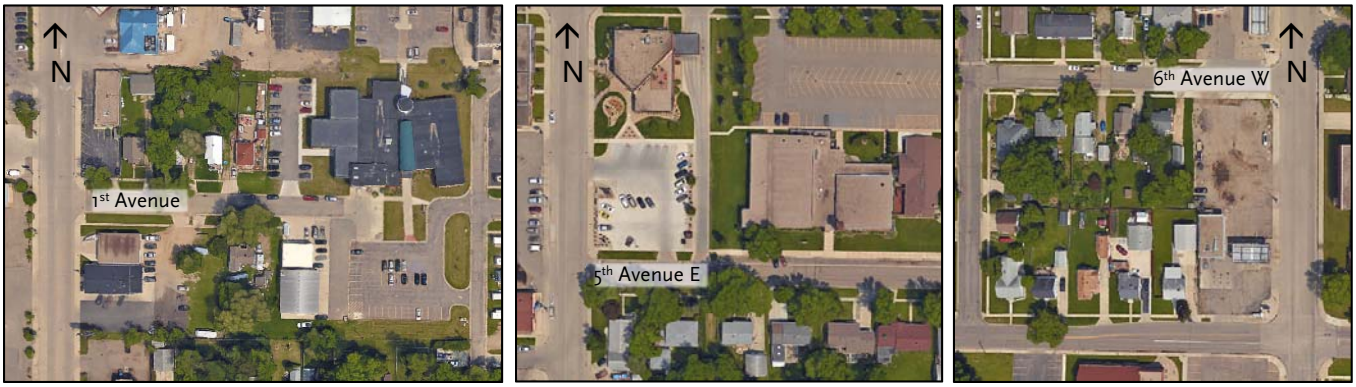
The west approach of 4th Avenue is converted into a park with the proposed redevelopment. While 4th Avenue east of Sheyenne Street provides connectivity and is a local collector, the west approach has limited connectivity. The proposed redevelopment will funnel traffic to 3rd and 5th Avenues instead.

Key Opportunities

Three potential roadway closures could facilitate safer operations and provide redevelopment opportunities:

- **1st Avenue.** There is minimal connectivity on 1st Avenue due to the configuration of the West Fargo School District property. Closing this roadway would require some reconfigurations of parking lots, but would be provide additional land for redevelopment.
- **5th Avenue East.** Closing the east approach of 5th Avenue, along with some portion of Bell State Bank's parking lot could be assembled into a parcel large enough for development. The alleyway and Bell State Bank driveway would remain open.
- **6th Avenue West.** The west approach of 6th Avenue would provide additional land for redevelopment. Morrison Street provides adequate connectivity to both 7th Avenue and 4th Avenue.

FIGURE V-42: KEY OPPORTUNITIES FOR POTENTIAL ROAD CLOSURES (1ST AVENUE, LEFT; 5TH AVENUE, MIDDLE; 6TH AVENUE, RIGHT)



VI) AESTHETICS PLAN

Research compiled by the National Institute of Health has found that street scale aesthetics, traffic calming and increased land use intensity and diversity has a positive correlation on walking and biking activity. With redevelopment and revised cross sections, Sheyenne Street is poised to see an increased interest in walking and biking activities. Aesthetics plans were developed for the three build alternatives on Sheyenne Street from Main Avenue to 7th Avenue and are shown in Figure VI-2, Figure VI-3 and Figure VI-4. The focus of the plans were for the downtown business area, however the Phase I aesthetic practices can be applied to Sheyenne Street from 7th Avenue to 13th Avenue. The aesthetic practices from Phase I focused on trees and lighting; aesthetic practices for downtown Sheyenne Street are described below.

- **Intersection Treatments.** Intersection treatments in the form of colored pavement contribute to a sense of place, as well as provide visual cues to drivers that the space is for pedestrians and bicyclists.
- **Downtown Gateway.** A gateway will define the extents of downtown and add character and brand to the area. This type of improvement can have a relatively high cost depending on size and design.
- **Parking Lot Screening.** Screening parking lots with fences and/or greenery is particularly important for large parking lots. This helps to delineate pedestrian space and improves aesthetics.
- **Street Art.** Street art like murals, small sculptures in bulb outs and vinyl wrapped utility cabinets are opportunities to infuse art into the streetscape without significant impacts to the restricted ROW.
- **Parklets.** Parklets are an extension of the sidewalk into on-street parking, generally utilizing one or two full parallel parking spaces. They are opportunities to provide small amounts of green space or street furniture without extending the sidewalks.
- **Light Fixtures**. All of the roadway alternatives include relocating lighting outside of the sidewalks. Consideration should be given to replacing the lighting standards to more appealing structures that blend into the context of the corridor.
- **Wayfinding**. Despite the current over-signed, cluttered state of the corridor documented in the existing conditions chapter of this report, wayfinding can help direct motorists, pedestrians and bicyclists to key areas along the corridor. Examples warranting way finding may include Armour Park, the downtown park and outdoor event center, the library, etc.

FIGURE VI-1: AESTHETIC IMPROVEMENTS EXAMPLES FOR DOWNTOWN SHEYENNE STREET

(Top Left, Vinyl Wrapped Utility Box; Top Middle Left, Mural; Top Middle Right, Parklet; Right, wayfinding; Bottom Left, Downtown Gateway; Bottom Middle Left, Lighting Strycture; Bottom Middle Right, Colored Pavement)

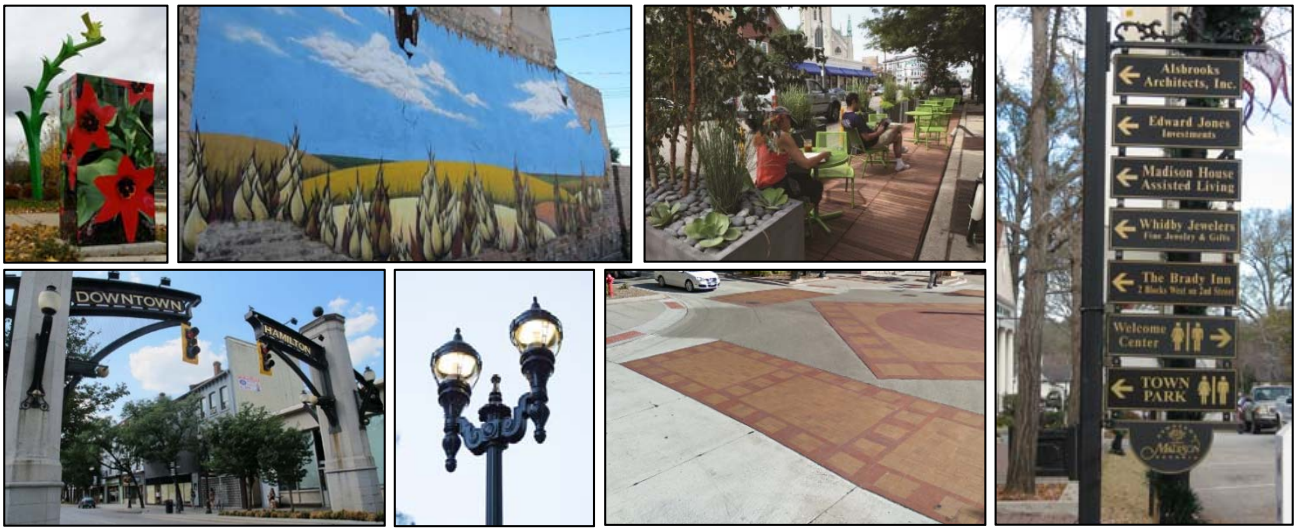


FIGURE VI-2: AESTHETICS PLAN FOR THREE-LANE SECTION WITH BULB OUTS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

Ⓐ 3D Rendering of Intersection

Ⓑ 3D Rendering of Plantings and Fence in Front of Parking Lot

Ⓒ Gateway to Downtown

Three-lane Section with Bulb-outs Alternative

Corridor-wide Enhancements

Artwork on Signal Cabinet

Bozeman, Montana

Wayfinding Signs

Sanford, Florida

Light Fixture with Banner Arms

North Manchester, Indiana

Street Furniture where Sidewalk Space Available

Lodz, Poland

Future Consideration for Parklet or Outdoor Seating

Minneapolis, Minnesota

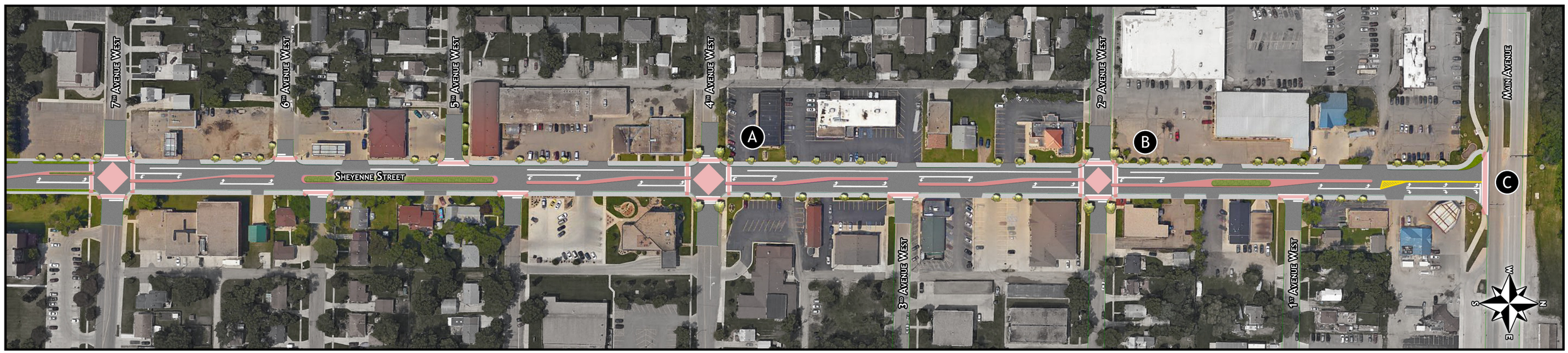
FIGURE VI-3: AESTHETICS PLAN FOR TWO-LANE SECTION WITH TURN LANES AND RAISED MEDIANS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

Ⓐ 3D Rendering of Intersection

Ⓑ 3D Rendering of Plantings and Fence in Front of Parking Lot

Ⓒ Gateway to Downtown

Two-Lane Section with Turn Lanes and Raised Medians Alternative



Corridor-wide Enhancements

Artwork on Signal Cabinet

Bozeman, Montana

Wayfinding Signs

Sanford, Florida

Light Fixture with Banner Arms

North Manchester, Indiana

Street Furniture where Sidewalk Space Available

Lodz, Poland

Future Consideration for Parklet or Outdoor Seating

Minneapolis, Minnesota

FIGURE VI-4: AESTHETICS PLAN FOR SEPARATED BICYCLE LANES ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

Ⓐ 3D Rendering of Intersection

Ⓑ 3D Rendering of Plantings and Fence in Front of Parking Lot

Ⓒ Gateway to Downtown

Separated Bike Lanes Alternative

Corridor-wide Enhancements

Artwork on Signal Cabinet

Bozeman, Montana

Wayfinding Signs

Sanford, Florida

Light Fixture with Banner Arms

North Manchester, Indiana

Street Furniture where Sidewalk Space Available

Lodz, Poland

Future Consideration for Parklet or Outdoor Seating

Minneapolis, Minnesota

Downtown Parks and Outdoor Event Center

There are a few parks near downtown West Fargo, including Armour Park and Herb Tintes Park/Veterans Memorial Pool, but due to location, access barriers and other limitations they do not serve the needs of downtown.

Armour Park is a great neighborhood amenity, including playgrounds and volleyball courts, and an enclosed shelter with rest rooms, electricity and running water, but the park lacks easy access due the Sheyenne River. Despite being less than 300 feet south of Armour Park, a visitor from West Fargo's downtown would have to travel more than a half-mile, going west on Sheyenne Street and then north and east through the residential development.

Herb Tintes Park, including Veterans Memorial Pool, is east of 1st Street between 6th and 7th Avenues includes ice rinks, the pool, playgrounds and tennis courts. This park is somewhat removed from the downtown and is convenient for supporting special events that use downtown like West Fest and Toppers Cruise Nights.

FIGURE VI-5: DOWNTOWN PARK EXAMPLES IN ST. PAUL (TOP), GRAND FORKS (MIDDLE) AND BOSTON (BOTTOM)

Sheyenne Street Park

Part of the redevelopment plan on the west side of Sheyenne Street has plans to convert 4th Street and part of the surrounding property into a small park. This park will further support existing community events like Cruise Night and West Fest, but will also provide green space and gathering space for the new development and surrounding neighborhoods.

Downtown Outdoor Event Center

Implementing a downtown outdoor event center project right off Sheyenne Street would be a major visionary project for the city. An opportunity has developed south of 1st Avenue between Sheyenne Street and 1st Street, however the park is still in concept stage, working to align the needs of stakeholders and consolidate property, like a land swap for West Fargo Public School's Lodoen Center parking lot. This event center could provide a variety of uses, supporting downtown activities and residents:

- A place to facilitate or expand existing events like West Fest or Topper's Cruise Night.
- A place to generate new events like concerts, community and work gatherings, etc.
- Green space for the increasing number of residents expected to be living in the area with redevelopment.

It is likely that with a park directly on Sheyenne Street, this type of event center will not be as necessary. However, it still would provide a valuable outdoor amenity to downtown West Fargo and to the greater West Fargo community.

FIGURE VI-6: POTENTIAL SHEYENNE STREET PARK

FIGURE VI-7: DOWNTOWN PARK AND OUTDOOR EVENT CENTER CONCEPT FOR DOWNTOWN WEST FARGO

VII) Implementation Plan

This study has identified opportunities to improve all aspects of Sheyenne Street from Main Avenue to 13th Avenue, running through West Fargo's downtown. It has evaluated possible redevelopment scenarios and their impact on Sheyenne Street's operations. Finally, this study developed improvements to address multimodal deficiencies and improve operations to support redevelopment into a vibrant downtown for West Fargo.

Short-Term Improvement Plan

The short-term improvement plan focuses on relatively low-cost but high-impact improvements that can be built in five years or less. These are pieces that will improve the attractiveness of downtown West Fargo and improve multimodal connectivity, but they will not achieve full revitalization on their own.

Redevelopment Accommodations

The large redevelopment proposed on the west side of Sheyenne Street from 2nd Avenue to 4th Avenue will drastically change the look and operation of the corridor. With five stories of mixed-use residential, commercial and office space, vehicle and multimodal traffic generation, parking demand and aesthetics will be impacted. Improvements to the corridor should be flexible enough to accommodate the needs of the redevelopment, including allowing the development to provide angled parking, if they provide their own ROW.

Based on information from the development as currently proposed, it is expected this development will require 205 parking spaces once completed. This can be accommodated with the proposed underground and surface parking lots and the available on-street parking, if 60 degree angled parking is provided for a total of 217 parking spaces. However, if the developer chooses not to provide angled parking due to impacts to their ROW, it is recommended that shared-parking agreements are made with surrounding businesses to achieve the 205 parking spaces required for weekend use.

With the proposed redevelopment including a large park, the west approach of 4th Avenue will be closed. Traffic control at 4th Avenue is discussed below.

Improvements related to redevelopment should be coordinated with the actual redevelopment. It is expected the first of two buildings will be constructed in Summer of 2016, with the second completed in Summer or Fall of 2017.

Traffic Control at 4th Avenue

With the closure of the west approach of 4th Avenue, a traffic control signal will not be warranted. However, with the more intense development and large park, providing a safe and efficient pedestrian crossing will be imperative at this location.

A pedestrian hybrid beacon (PHB) could be implemented at this location, but it is unlikely to meet guidelines presented in the MUTCD. For this reason, a rectangular rapid flashing beacon (RRFB) and pedestrian refuge island on the northbound approach are recommended at this intersection. Unlike the PHB, the RRFB is passively activated, or must be activated by the pedestrian, but it does come with a lower cost and similar pedestrian safety benefits.

Typical cost of rectangular rapid flashing beacon and pedestrian refuge island: $30,000.

FIGURE VII-1: RECTANGULAR RAPID FLASHING BEACON ON 40TH AVENUE NEAR SHEYENNE HIGH SCHOOL

Traffic Control Signal at 7th Avenue

Future operations at 7th Avenue are expected to produce a minute of delay per vehicle and queues in excess of 300 feet. This intersection is responsible for 30 percent of all crashes along the corridor; 40 percent are for failure to stop and 18 percent from long queues.

With redevelopment along Sheyenne Street, the intersection of Sheyenne Street and 7th Avenue will likely meet the Four-Hour Vehicular Volume; additionally there have been five angled crashes in 13 months, narrowly missing the required 12-month time frame to meet the Crash Experience Warrant. A traffic control signal will improve overall operations to LOS "B" and reduce queues on both major approaches. A traffic control signal at this location will also be critical for safe and efficient pedestrian crossings of Sheyenne Street.

With the imminent redevelopment, it is recommended this traffic control signal be installed as soon as feasible.

Typical cost of traffic control signal: $300,000.

Roadway Cross Section

Sheyenne Street from Main Avenue to 7th Avenue

A roadway serving a downtown, like Sheyenne Street from Main Avenue to 7th Avenue must balance vehicular traffic needs as well as pedestrian, bicycle, transit, parking and aesthetics. Currently, pedestrian amenities lack defined crossing areas, comfort and accessibility, leading to undesirable walking conditions; bicycle facilities are non-existent, resulting in people riding bicycles on the sidewalk, which is prohibited by city ordinance and creates conflicts with utilities and pedestrians. While vehicle speeds were not significantly higher than posted speeds, lowering speeds is important for the current and expected pedestrian and bicycle traffic.

To provide a more balanced transportation network in downtown West Fargo, the Three-Lane Section with Bulb Outs Alternative is recommended for implementation. Key components of this improvement plan include:

- Improved pedestrian safety with bulb outs to improve pedestrian visibility.
- Improved pedestrian experience with relocated lights and signs, for cleared and wider sidewalk space.
- Maintains the two-way left-turn lane for efficient access into driveways and key intersections.
- Traffic control at 4th Avenue and 7th Avenue intersections.
- Traffic calming with narrowed lanes and bulb outs to reduce turning radius and further constricting the roadway at key crossing locations.
- Additional on-street parking, which also buffers the sidewalk, improving pedestrian comfort.
- Access management to improve vehicular safety and operations.
- Estimated cost of $190,000, which does not include the aesthetics plan.

This alternative, along with all other feasible alternatives was presented at Public Input Meeting #2, where it received the highest support among attendees, with 37 percent of votes.

FIGURE VII-2: THREE-LANE SECTION WITH BULB OUTS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE (AT INTERSECTION)

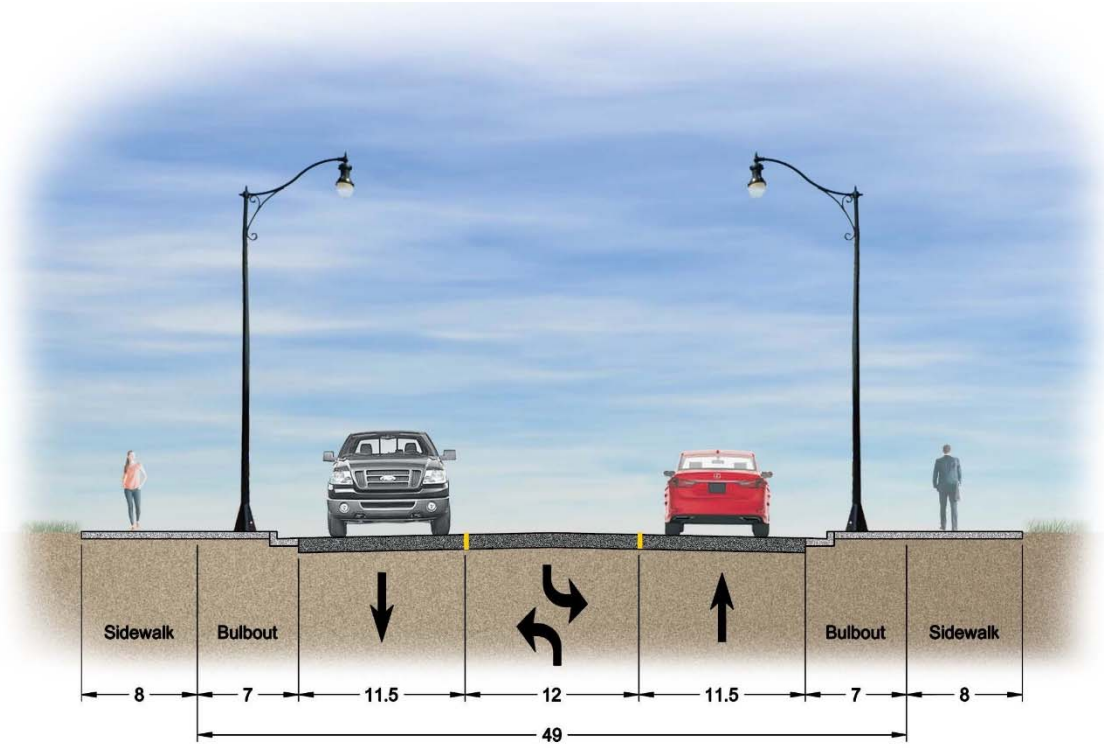
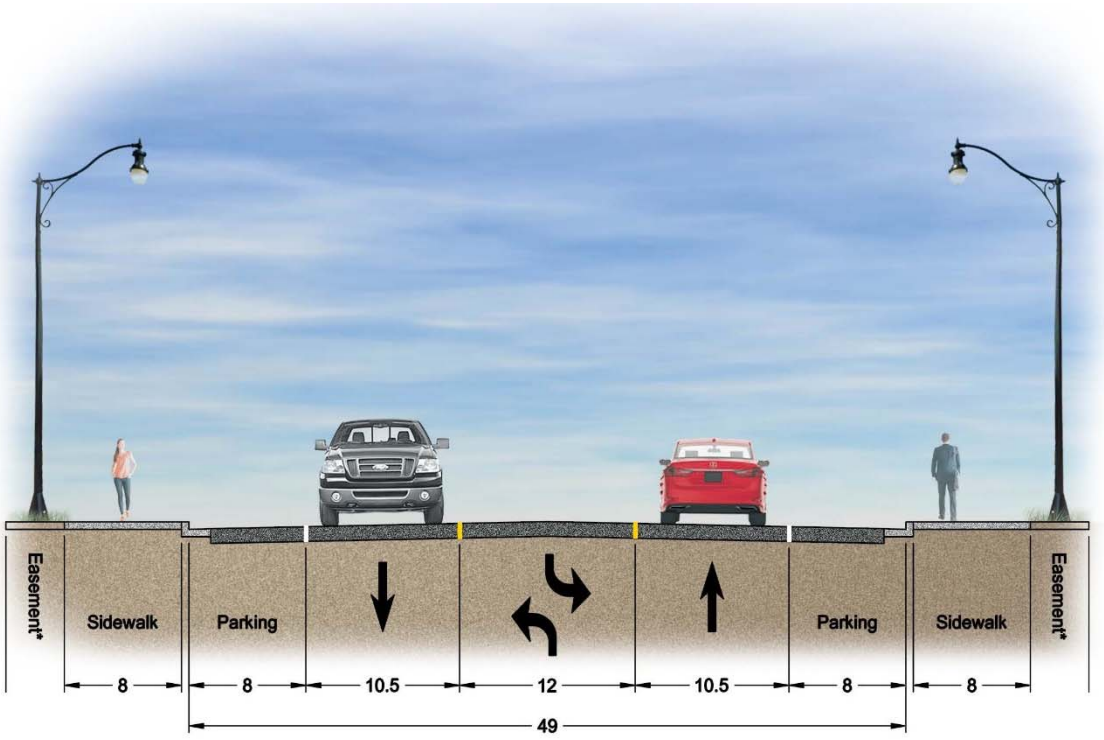


FIGURE VII-3: THREE-LANE SECTION WITH BULB OUTS ROADWAY ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE (BETWEEN INTERSECTIONS)



*Easement will be required for lighting and signs.

Sheyenne Street from 7th Avenue to 13th Avenue

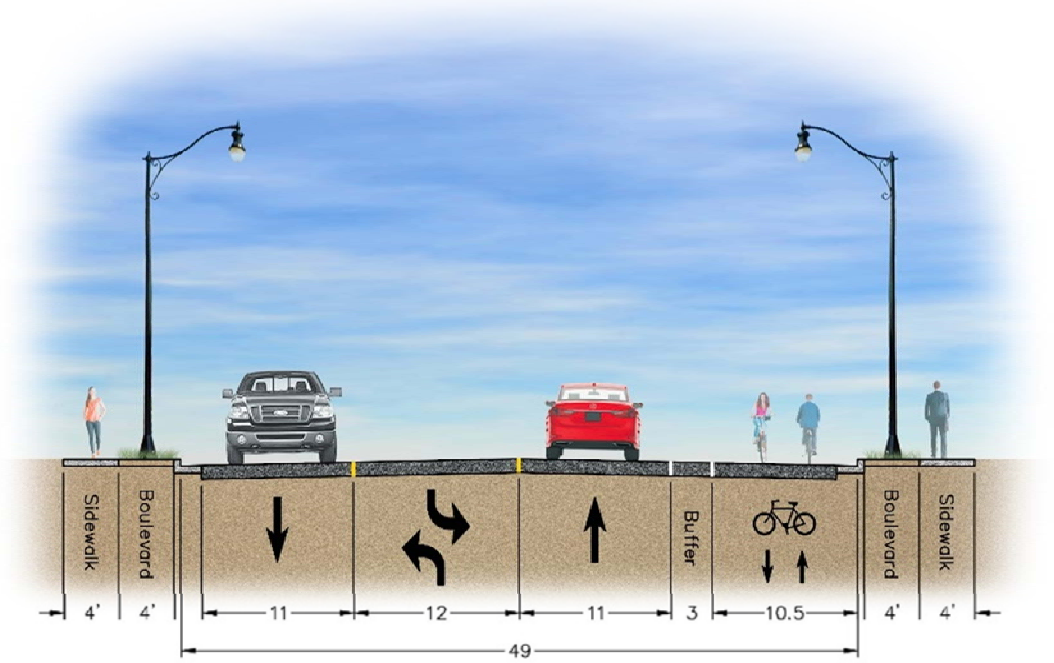
The needs of Sheyenne Street from 7th Avenue to 13th Avenue are different than those of Sheyenne Street from Main Avenue to 7th Avenue. South of Sheyenne Street, the sidewalks are clear and buffered and on-street parking is unused. However, there are still no bicycle facilities and densely spaced off-set access points increase head-on crash potential.

The Separated Bicycle Lanes Alternative is recommended for this section of Sheyenne Street. Key components of this plan include:

- Underutilized parking converted to two-way bicycle lanes on the east side of Sheyenne Street that will allow for a continuous bicycle facility on the east side of Sheyenne Street from 7th Avenue to 40th Avenue by 2019.
- Traffic calming with narrowed lanes.
- Estimated cost of $65,000.

This alternative, along with all other feasible alternatives was presented at Public Input Meeting #2, where it was nearly tied with the Do Nothing Alternative, with 36 percent of the votes. The Do Nothing Alternative received 39 percent of the votes.

FIGURE VII-4: SEPARATED BICYCLE LANES ALTERNATIVE FOR SHEYENNE STREET FROM 7TH AVENUE TO 13TH AVENUE



Bicycle Routing Plan

Based on the preferred roadway cross section, bicycle facilities will be provided on 1st Street from Main Avenue to 7th Avenue and on Sheyenne Street from 7th Avenue to 13th Avenue. The following improvements will be required to accommodate bicycle facilities:

- A shared-use path from Main Avenue to 1st Avenue along 1st Street will require sidewalk widening due to conflicts with turn lanes and parking.
- "Sharrow" pavement markings on 1st Street from 1st Avenue to 6th Avenue.
- Pavement markings to delineate bicycle lanes from 6th Avenue to 7th Avenue along 1st Street to avoid conflicts with angled parking provided at the elementary school.
- "Sharrow" pavement markings on 7th Avenue from Sheyenne Street to 1st Street.

FIGURE VII-5: "SHARROW" ON BROADWAY IN DOWNTOWN FARGO

- Pavement markings to delineate separated bicycle lanes on Sheyenne Street from 7th Avenue to 13th Avenue.

This plan will connect bicyclists from the shared-use path on Main Avenue to the shared-use path on 40th Avenue along the east side of Sheyenne Street once reconstruction of the corridor is complete.

Parking Standards

As redevelopment interest increases, it is critical that parking standards are established in a way that most benefits the corridor. During the study, City of West Fargo Planning Department staff expressed interest in refining the current parking requirements in downtown West Fargo, indicating preference for parking maximums and further considering fee-in-lieu parking ordinances.

While specific revisions to the City's ordinances are outside the scope of this report, a variety of examples were provided in the body of the report. It is recommended City staff review these in an effort to establish revised parking standards.

Finally, it is important that parking standards respond to changes. As the character of downtown West Fargo changes to a traditional downtown, so too will the goals and needs. City staff, in concert with the Downtown Design Review Committee, should continue to monitor the parking standards to ensure they match the current goals and vision of the downtown.

Eastbound Right-Turn Lane at Main Avenue and Sheyenne Street Intersection

Even though the Main Avenue intersection operates at LOS "D" or better under all redevelopment scenarios, it is recommended that an eastbound right-turn lane is constructed to improve the approach and intersection operations to LOS "C".

Typical cost of a right-turn lane is $75,000.

Access Management Plan

The proposed Access Management Plan would reduce access risk by 20.6 percent along Sheyenne Street from Main Avenue to 7th Avenue. There are few opportunities to feasibly address access spacing along Sheyenne Street south of 7th Avenue. To implement this plan, the City will need to work with property owners to remove and relocate driveways and facilitate cross-access agreements where driveways are to be combined. During the negotiations with property owners, the Access Management Plan will be refined to incorporate the needs of the property owners. Changes to access should be completed when the roadway is reconfigured or when redevelopment occurs. Areas prime for redevelopment could have access management applied during the redevelopment process.

Aesthetics Plan

Street scale aesthetics, traffic calming and increased land use and intensity have a positive correlation on walking and biking activity, so the streetscape along Sheyenne Street should be high priority consideration given the redevelopment activity. The aesthetics plan for the Three-Lane Section with Bulb-Outs Alternative includes colored pavement for crosswalks at key intersections, parking lot screening and a gateway at the Main Avenue and Sheyenne Street intersection. Improved wayfinding, artwork on utility boxes, street furniture and outdoor seating were also included.

Summary of Short-Term Improvement Plan Costs

Found in Table VII-1 is a summary of the short-term improvement plan costs for recommended infrastructure. It does not include any costs associated with the access management plan or the aesthetics plan.

TABLE VII-1: SUMMARY OF SHORT-TERM IMPROVEMENT PLAN COSTS

Improvement	Estimated Cost
Traffic Control And Pedestrian Accommodations At 4th Avenue	$30,000
Traffic Control At 7th Avenue	$300,000
Three Lane Section With Bulb Outs On Sheyenne Street From Main Avenue To 7th Avenue	$475,000
Separated Bicycle Lanes Alternatives On Sheyenne Street From 7th Avenue To 13th Avenue	$65,000
Main Avenue Right-Turn Lane	$75,000
Estimated Total Cost For Short-Term Improvement Plan	$945,000

FIGURE VII-6: RECOMMENDED ACCESS MANAGEMENT PLAN FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE

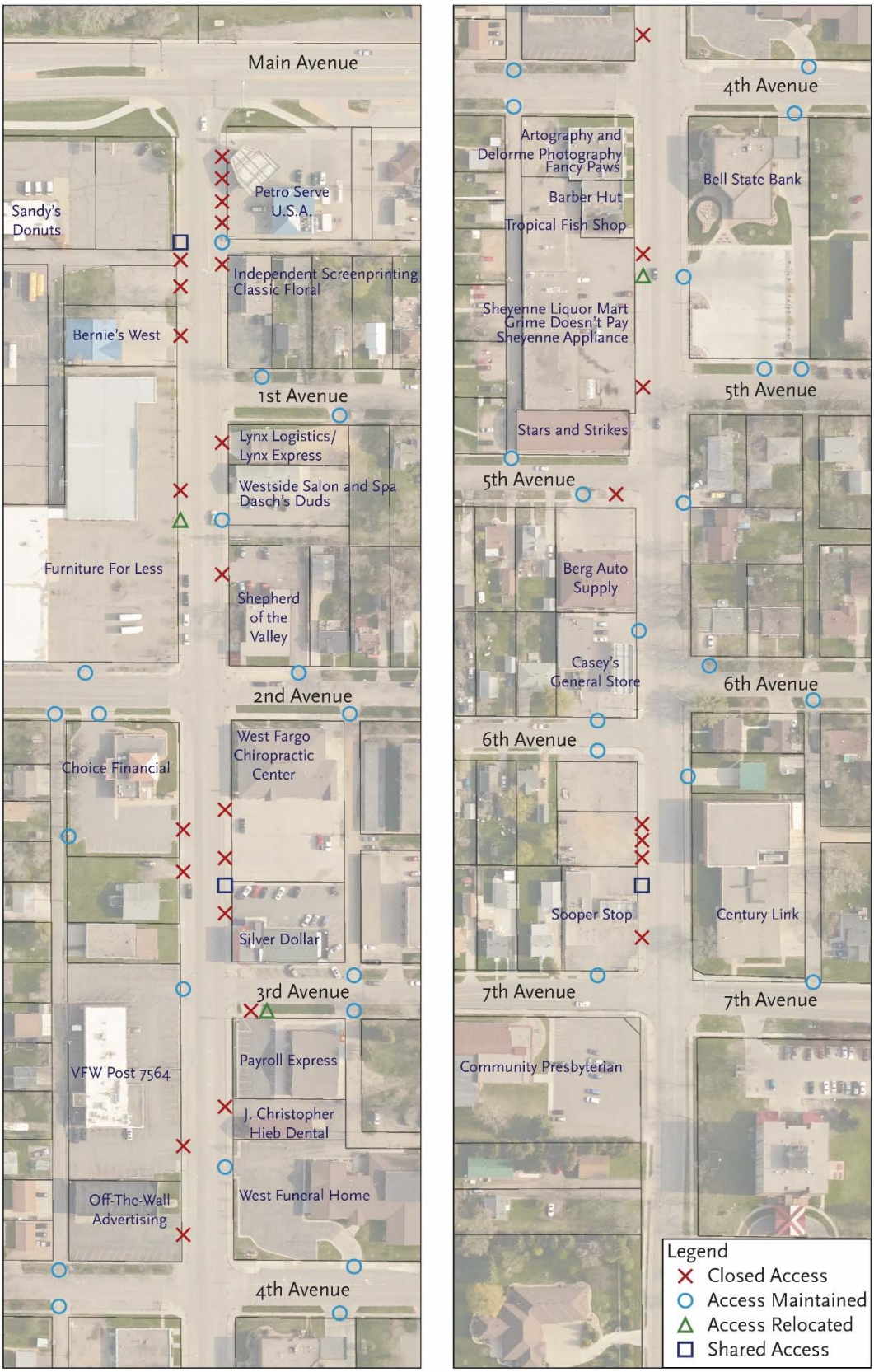
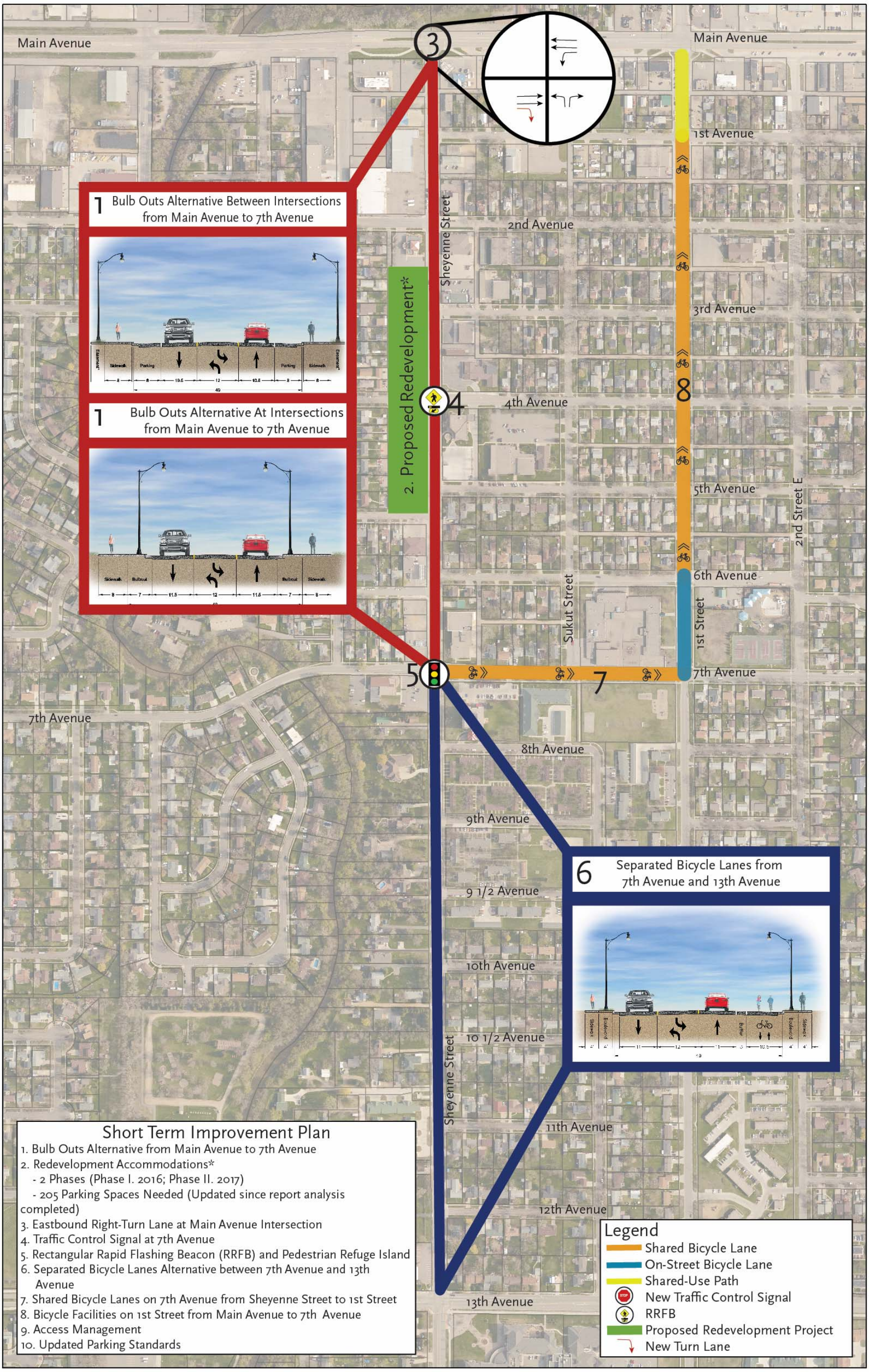


FIGURE VII-7: SUMMARY OF SHORT TERM IMPROVEMENT PLAN



Visionary Projects

A variety of "visionary" projects have been included in this report. These types of projects are not necessary for a safe and efficient multimodal transportation network, but instead would enhance connectivity to surrounding neighborhoods and parks, the streetscape and aesthetic elements and reconfigure parking and vacant and underutilized land for further redevelopment. No time frame has been placed on these projects due to various scopes, stakeholders and feasibilities.

Pedestrian and Bicycle Bridges

The short-term improvements outlined above will improve multimodal connectivity along the corridor, but the pedestrian and bicycle bridges would improve connectivity across the river and Main Avenue.

- A trail and footbridge alignment across Main Avenue and the Sheyenne River would connect downtown West Fargo to Armour Park and the small residential and industrial development north of Main Avenue.
- A footbridge over the Sheyenne River at 2nd Avenue/ Grieson Avenue would provide the residential development west of the Sheyenne River with another location to cross the river to access downtown West Fargo. This would facilitate foot traffic and potential transit access for the area.

FIGURE VII-8: POTENTIAL FOOTBRIDGE LOCATIONS

Typical cost of a pedestrian bridge is $600,000. This estimate does not include a hydraulic lift system; if that is deemed necessary it would add an additional $500,000 to the cost of the bridge.

Land Reconfiguration

Multiple opportunities exist to reconfigure existing land uses to maximize developable land and minimize unnecessary parking and transportation elements. As the corridor evolves, it is expected land prices will increase with redevelopment activity, making land reconfiguration more appealing. Within the body of the report, a variety of alternatives were presented that would provide redevelopment opportunities, including:

- Closing low-volume roadways
- Shared parking arrangements
- City owned off-street parking
- Converting parking lots into developable land

This improvement strategy, more than any other presented in this report is opportunity driven. The improvements listed in the report are just for example and will change as the land uses and demands along the corridor change.

1st Street Traffic Calming

As congestion builds, it is possible that drivers will look for a faster route with less congestion, like 1st Street. Given the nearby uses of an elementary school and park, traffic calming may be necessary to slow vehicles and encourage them to select a different route. Examples may include speed humps, curb extensions, medians and mini traffic circles.

Revised Cross Section

It is expected that pedestrian and bicycle activity will increase with redevelopment, improvements to multimodal connectivity and the provision of more multimodal generators, like the downtown park and outdoor event center. As the corridor users evolve, the roadway should evolve as well to meet the new needs. At a future time, when increased bicycle activity necessitates improved bicycle facilities along Sheyenne Street from Main Avenue to 7th Avenue, and when it can be coordinated with rehabilitation projects, consideration should be given to converting the corridor to the Separated Bicycle Lane Alternative.

Implementing the Separated Bicycle Lane Alternative will complete the connection from Main Avenue to 40th Avenue, with potential to connect to 52nd Avenue. The relatively low cost of the Bulb Out Alternative allows this more transformative project to be implemented without significantly wasted funds.

FIGURE VII-9: SEPARATED BICYCLE LANES ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE (AT INTERSECTIONS)

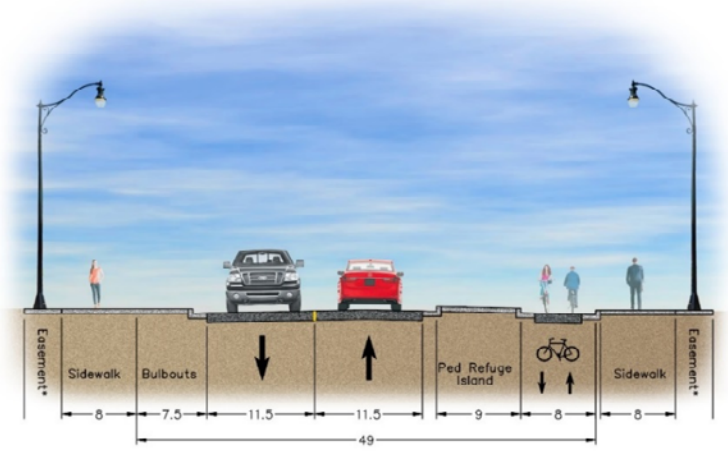
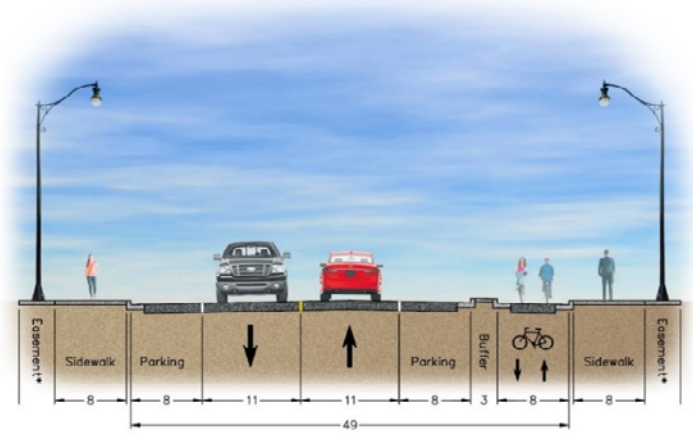


FIGURE VII-10: SEPARATED BICYCLE LANES ALTERNATIVE FOR SHEYENNE STREET FROM MAIN AVENUE TO 7TH AVENUE (BETWEEN INTERSECTIONS)



Downtown Park and Outdoor Event Center

The City is currently evaluating the feasibility of a park and event center south of 1st Avenue, between Sheyenne Street and Main Avenue. This would require buying out two properties from private owners and relocating the West Fargo School District parking lot. This park would provide additional green and gathering space for the downtown, similar to the Water Wheel Park in downtown Grand Forks; Mears Park in downtown St. Paul or the Lawn on D in south Boston. It would provide a space for new special events and a congregation area during events like West Fest. However, with the proposed park included in the redevelopment along Sheyenne Street near 4th Avenue, it is possible this park is unnecessary.

FIGURE VII-11: DOWNTOWN PARK AND OUTDOOR EVENT CENTER CONCEPT

FIGURE VII-12: SUMMARY OF VISIONARY PROJECTS