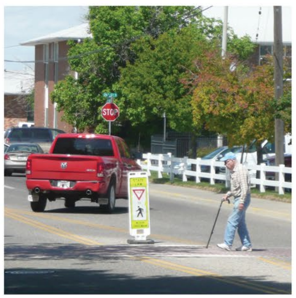
GREAT FALLS AREA
LONG RANGE TRANSPORTATION PLAN 2024

Prepared for:

Great Falls MPO

March 22, 2024



Existing and Projected Conditions

TECHNICAL MEMORANDUM

Prepared by:

RPA
CIVIL ENGINEERING / PLANNING / SURVEYING

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1.0 INTRODUCTION

As the Great Falls area continues to grow and evolve, it is important to understand the current transportation network and identify opportunities for improvement to properly accommodate and prepare for the area's future transportation needs. To better understand transportation conditions within Great Falls, existing and projected transportation conditions were evaluated to understand strengths, deficiencies, and any potential areas of concern. For this plan, existing traffic data from a variety of sources were used to establish the existing conditions on major road segments within the study area. The existing data were then projected out to the year 2045 using growth rates derived from analysis of historic and projected growth patterns as discussed in the *Socioeconomics and Land Use Technical Memorandum*. With this data, the operational characteristics and potential traffic issues over the 2040 planning horizon were identified. A variety of data were used to help evaluate the system, including transportation network configurations and classifications, traffic data, intersection turning movement counts, infrastructure condition and performance, and historic crash data.

The existing and projected transportation conditions in Great Falls were evaluated to identify and better understand system strengths, deficiencies, and potential areas of concern.

1.1. Study Area Boundary

The study area boundary for the 2024 *Great Falls Area Long Range Transportation Plan* (LRTP) coincides with the boundary used in preceding plan updates. The boundary includes all lands within the City of Great Falls, Malmstrom Air Force Base (AFB), the unincorporated communities of Black Eagle and Gibson Flats, and adjacent lands in Cascade County where suburban development has occurred or may occur in the future. The LRTP boundary is shown in **Figure 1.1** and will be used for all aspects of the LRTP planning process. The urban boundary shown in the figure is based on the 2020 census and review by the Great Falls Metropolitan Planning Organization (MPO) and Montana Department of Transportation (MDT). Field analysis of transportation system conditions will only occur within the defined study area. Areas adjacent to the study area still influence the transportation system within the study area and the planning process will still consider growth and land use changes in adjacent areas.

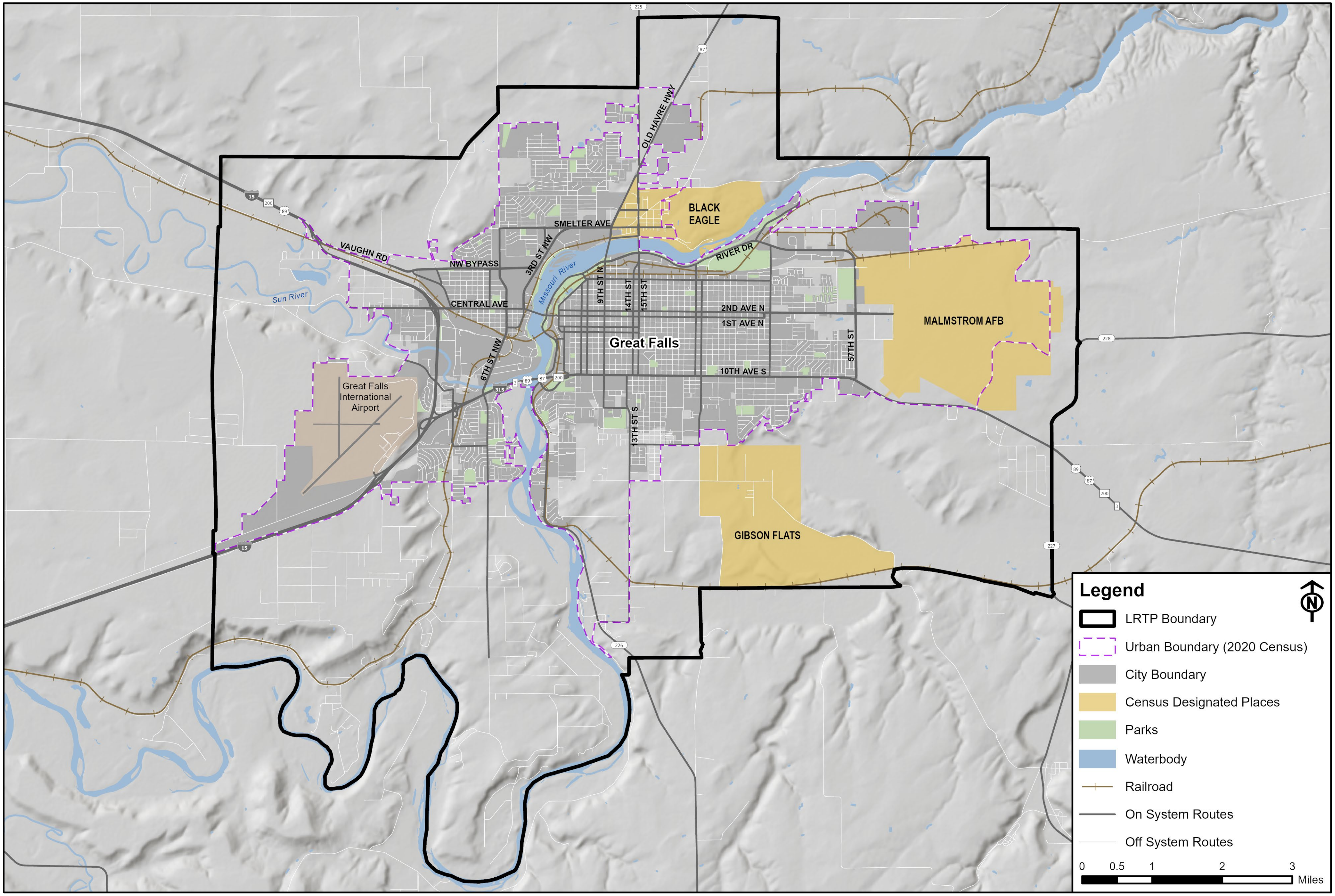


Figure 1.1: Study Area

1.2. Background

Federal regulations require MPOs to prepare a transportation plan that identifies how the area will manage and operate its multimodal transportation system to meet the region's economic, transportation, development, and sustainability goals over a 20-plus year planning horizon. An MPO is a policy-making body created to represent urban areas with populations over 50,000 residents. The Great Falls MPO was established in 1971 to help guide transportation planning and programming efforts in the area. The following sections summarize federal and local planning that will influence development of the Great Falls LRTP.

1.2.1. Federal Planning

On November 15, 2021, President Joe Biden signed the Infrastructure Investment and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL) into law. IIJA authorizes federal highway funding programs for five years (fiscal years 2022 – 2026) with increased investment in highways in bridges. This legislation is important to the planning process as it outlines several new discretionary funding programs, expanded eligibility for apportioned highway programs, changes to the Metropolitan Planning Program, and new requirements for MPOs. Of particular interest to this planning effort, IIJA requires MPOs to consider projects and strategies that promote consistency between transportation improvements and state and local housing patterns, in addition to planned growth and economic development patterns. IIJA also introduces new plans that are required to be prepared by states in consultation with MPOs as well as recommended plans which are voluntary for MPOs.

FEDERAL PLANNING FACTORS

When developing LRTPs, there are 10 national planning factors, codified in 23 USC 134(h)(1), that states and MPOs must consider. These planning factors address transportation issues such as connectivity, economic vitality, quality of life, and resiliency.

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety of the transportation system for motorized and non-motorized users.
3. Increase the security of the transportation system for motorized and non-motorized users.
4. Increase the accessibility and mobility of people and for freight.
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth, housing, and economic development patterns.
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
7. Promote efficient system management and operation.
8. Emphasize the preservation of the existing transportation system.
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation.
10. Enhance travel and tourism.

1.2.2. Local Planning

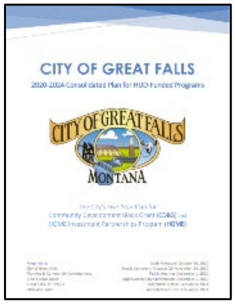
The last major transportation plan for Great Falls was completed in 2014 with a minor update in 2018. The 2024 LRTP is an opportunity to take a fresh look at changed transportation conditions, re-evaluate community priorities, and plan for a transportation system that reflects those changes. The LRTP is also intended to complement and integrate with past transportation plans, current growth policies, and other relevant planning documents completed by the city, MPO, and Cascade County in recent years. These documents include analysis and recommendations for facilities or future improvements within the study area. The following sections provide a summary of the plans and studies completed since the last LRTP update as they relate to this planning effort.

GREAT FALLS WAYFINDING PLAN (2020)

The *Great Falls Wayfinding Plan*[1] provides a vision and strategy for the community to implement a citywide sign program. The plan will help residents and visitors learn about the services, destinations, and points of interest that are available in Great Falls. Primary destinations include the Downtown, natural sites, sports and entertainment venues, educational institutions, transportation hubs, civic government services, and city parks and recreation. The plan identifies four transportation hubs including the airport, bus transit transfer station, and the north and south parking garages. Directional signs for both motorists and pedestrians are included.

HOUSING MARKET DEMAND ASSESSMENT (2021)

A housing market demand assessment[2] was completed for the Great Falls Metropolitan Statistical Area to understand key housing trends and demand drivers including employment and demographic trends. The study projects that there will be demand for about 450 new housing units per year in the Great Falls area over the next 10 years including approximately 190 rental units and 250 for sale/ownership units. This analysis is based on employment growth predictions, anticipation of increased in-migration to Great Falls, and an assessment of the age of housing stock. The study emphasizes the need for affordable housing. This information helped inform socioeconomic projections and land use forecasts. Understanding the quantity, type, and location of new developments will help inform the identification of transportation system needs to support new development.

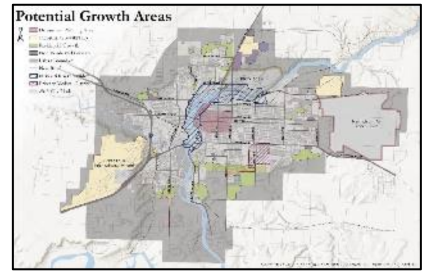


CONSOLIDATED PLAN FOR HUD-FUNDED PROGRAMS (2021)

The *Great Falls 2020-2024 Consolidated Plan*[3] is required for participation in U.S. Department of Housing and Urban Development (HUD) funded programs including the Community Development Block Grant (CDBG) and Home Investment Partnerships Program (HOME). The Consolidated Plan identifies the housing and community development needs of low to moderate income residents of Great Falls and develops strategies for addressing those needs in a comprehensive, coordinated fashion using available federal and non-federal resources. The plan is accompanied by an *Annual Action Plan*[4] which details the city's recommended grant goals, priorities for the upcoming program year, and budget. Consideration of local housing patterns is important to ensure transportation improvements align with community development needs.

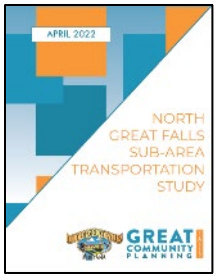
GREAT FALLS TRANSPORTATION IMPROVEMENT PROGRAM (2021 – 2025)

The *Transportation Improvement Program (TIP)*[5] is a staged, prioritized five-year capital improvement plan for implementation of the LRTP, expenditure of federal funds, and construction of other capital projects that occur on Great Falls' Federal-Aid roadways. Developed in cooperation with local, state, and federal agencies, the TIP includes transportation facilities and projects that are the responsibility of the state, county, and city. The most recent TIP was approved in 2021 and amended in 2023 with a summary of projects and programs to be implemented in fiscal years 2021 through 2025. The TIP contains projects consistent with the LRTP and reflects the investment priorities established in the plan.



GREAT FALLS GROWTH POLICY UPDATE – INTERNAL DRAFT (2022)

In 2022, the City of Great Falls undertook a planning effort to perform a minor update to the 2013 Growth Policy. The update is in draft form and was shared internally with the LRTP planning team to inform the planning process. The policy has not been finalized or shared publicly due to the need for a more intensive update process including updated goals, objectives, and strategies. Still, the updated data and information about local growth is relevant to the transportation process and is quoted where applicable.



NORTH GREAT FALLS SUB-AREA TRANSPORTATION STUDY (2022)

The *North Great Falls Sub-Area Transportation Study*[6] was developed in response to the development occurring in the northwest portion of Great Falls and subsequent concerns about traffic impacts. The purpose of the study was to develop a vision for expansion of and improvements to the multimodal transportation network in the sub-area to maximize safety, accessibility, and efficiency for all users. The study identified nine short-term projects and six long-term projects for implementation in the sub-area based upon the future modeling and capacity analysis, safety analysis, and public input. These projects should be considered and incorporated into the LRTP recommendations as appropriate.

GREAT FALLS UNIFIED PLANNING WORK PROGRAM (2024)

The purpose of the *Unified Planning Work Program (UPWP)*[7] is to present a detailed explanation of the planning activities anticipated to be undertaken within the Great Falls area during the UPWP program year. The document identifies program objectives, past accomplishments, agency responsibilities, level and source of funding, and the interrelationship of upcoming planning activities. Priorities outlined in the current UPWP include identifying funding sources for priority projects, maintaining communication between implementation partners, continually monitoring projects to ensure timely implementation, constructing more pedestrian and bicycle facilities, and maintaining up-to-date planning documents. The UPWP provides an understanding of MPO functions and will help identify priorities for the LRTP.

2.0 EXISTING TRANSPORTATION SYSTEM

Current information about the transportation system was analyzed to establish the existing traffic conditions and to determine current problem areas. The following analysis of transportation conditions includes a planning level examination of the roadway network within the LRTP study area based on existing traffic data, crash history, field observations, infrastructure condition data, aerial imagery, and geographic information system (GIS) data. Existing data were provided by the City of Great Falls and MDT. Additional data were collected by RPA in Spring and Summer 2023 to supplement the available information. Using a combination of the supplied and collected data, the existing operational characteristics of the transportation network were established.

2.1. Transportation Network

A transportation network is made up of multiple connected road segments to facilitate vehicular movement, as well as public transportation, bicycles, pedestrians, freight, rail, and other modes of transportation. Gaining a thorough understanding of each component of the transportation network will help ensure that all modes of transportation are able to navigate the transportation network safely and efficiently.

2.1.1. Major Street Network

A transportation system is made up of a hierarchy of roadways classified according to certain parameters. The parameters include but are not limited to geometric configuration, traffic volumes, spacing in the community's transportation grid, speed, and adjacent land use. These characteristics help define the role that each segment of roadway plays within the overall network. The method by which these roles are defined is widely known as functional classification, which defines the nature of travel within the network in a logical and efficient manner by defining the objectives that any particular road or street should meet to effectively move trips through the entire network.

Included in the study area are roadways with the functional classifications of interstate, principal arterial, minor arterial, collector street, and local street. For this plan, these functional classifications are neither limited to, nor defined by, "urban" or "rural" settings, though some entities often make a distinction between urban and rural functional classes. Rural roadways in the study area generally carry a smaller volume than their urban counterparts. Although traffic volumes may differ between urban and rural sections of a roadway, it is important to still maintain coordinated right-of-way standards to allow for efficient operation and potential urban development in the future.

For this evaluation, emphasis was placed on roadways within the study area that are functionally classified as collectors, minor arterials, and principal arterials. Local streets, which are the lowest ranking roadways, were not examined in detail due to the assumption that if the major street network is functioning at an acceptable level, the local roadways should not be used beyond their intended function. However, if problems begin to occur on the major street network, then the resulting issues will begin to infiltrate the local road network. As such, the overall health of a community's transportation system can be characterized by the health of the major street network.

Figure 2.1 presents the existing major street network for the study area. The functional classifications shown in the figure were established based on a review of the federally approved functional classification system as well as the major street network presented in the previous LRTP. Efforts were made to maintain consistency with these networks, however, some parts of the network were updated to reflect changed conditions from previous planning efforts. The classifications are used for planning purposes and may not be fully representative of actual conditions. Rather, they are intended to reflect how the systems currently functions, as viewed by the responsible implementing agency. General descriptions of these functional classifications are described in the following sections.

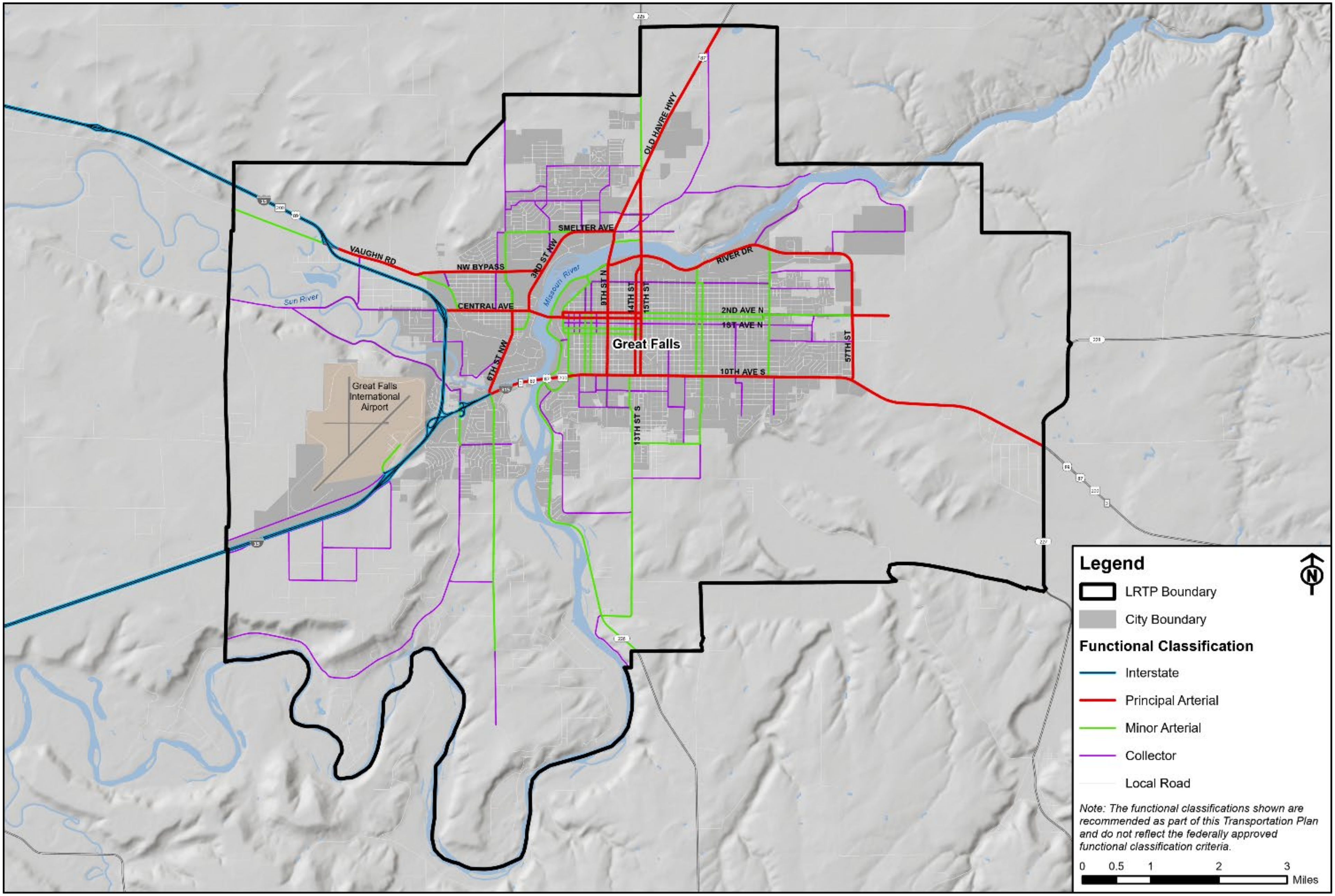


Figure 2.1: Major Street Network

INTERSTATE SYSTEM

The main purpose of the interstate system is to provide for both regional and interstate transportation of people and goods. Primary users range from residents and commuters to long-distance travelers and freight operators. Interstates characteristically have fully controlled access with a limited number of interchanges, high design speeds, and a high priority on driver comfort and safety. The interstate system has been designed as a high-speed facility with all road intersections being grade separated. Interstate 15 (I-15) traverses north-south across the study area as a four-lane divided highway.

I-15 passes through the study area and provides both regional and interstate transportation.

PRINCIPAL ARTERIAL SYSTEM

The purpose of a principal arterial is to serve the major centers of activity, the highest traffic volume corridors, and the longest trip distances in an area. This classification of roadway carries a high proportion of the total traffic. Most of the vehicles entering and leaving the area will use principal arterials. Significant intra-area travel, such as between central business districts, outlying residential areas, and major suburban centers, is also typically served by principal arterials. Principal arterials mainly connect to other principal arterials or to the interstate system.

10th Avenue South is an east-west principal arterial connecting I-15 and US 87.

MINOR ARTERIAL STREET SYSTEM

The minor arterial street system interconnects with and supplements the principal arterial system. Minor arterials accommodate trips of moderate length at a somewhat lower level of travel mobility, as compared to principal arterials. They distribute travel to smaller geographic areas in addition to providing some access to adjacent lands.

Outside of Downtown Great Falls, 1st and 2nd Avenues South comprise a one-way couplet of minor arterials.

COLLECTOR STREET SYSTEM

The collector street network provides links from residential, commercial, and industrial areas to the arterial street network. This type of roadway differs from those of the arterial system in that collector roadways may traverse residential neighborhoods. The collector system distributes trips from the arterials to the user's ultimate destinations while also collecting traffic from local streets in the residential neighborhoods and channeling the traffic to the arterial system.

36th Ave NE serves as a collector street for the North Great Falls neighborhoods.

LOCAL STREET SYSTEM

The local street network comprises all facilities not included in the higher functional classes. The primary purpose of local streets is to permit direct access to abutting lands and connections to higher systems. Most local streets also provide residential and commercial access. Usually, service to through-traffic movements is intentionally discouraged either through low speeds or other traffic calming measures.

Local streets primarily provide access to residential and commercial developments in Great Falls.

2.1.2. Bicycle and Pedestrian Facilities

The Great Falls Area is home to the River's Edge Trail (RET) which boasts an approximately 60-mile off-street bicycling and walking system along the banks of the Missouri River. In general, Great Falls' older core neighborhoods and grid street system with small blocks lend themselves to walking and non-motorized transportation. While pedestrians have ample access to sidewalks and trails in and around the city, there is a relative lack of designated bicycle infrastructure. The city's first bike lane was installed in Summer 2013 with relatively few additions since then. As such, there are many opportunities for improvement to the non-motorized transportation network, especially improvements to the bicycle network. The following list describes the existing bicycle and pedestrian facilities in the study area. A map of the existing bicycle and pedestrian facilities is presented in **Figure 2.2**.

BIKE LANES, BIKE BOULEVARDS, AND BIKE ROUTES

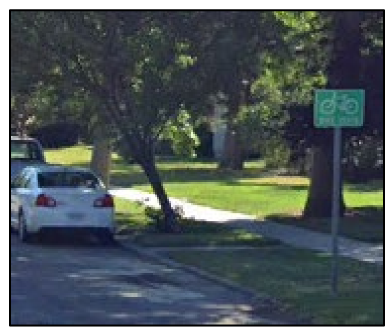
Bike lanes are a portion of a roadway which have been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. Bike lanes encourage predictable movement by both bicyclists and motorists. The Great Falls area currently has 4.1 miles of bike lanes, primarily on the east side of the city near Malmstrom Air Force Base (AFB).

Bike lanes are painted on 57th Street North, a relatively high-speed roadway. There is a gap between the 57th Street North and 18th Avenue North bike lanes.

Bike boulevards are streets that have been modified to accommodate bicycle traffic and minimize motor traffic. Bike boulevards are typically characterized as streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority through the use of signs, shared lane markings (sharrows), and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets. In Great Falls, there are approximately 4.9 miles of roadways with painted sharrows, although they generally lack signage designating them as a bike boulevard. Additionally, some of the sharrows on these roadways have not been maintained since their installation and are sometimes difficult to discern.

Sharrows are painted on 5th Street North which is a one-way street. There is not a parallel street with sharrows provided in the opposite direction.

In Great Falls, several streets with lower traffic volumes and convenient connections to high-use destinations in the community are signed as **bike routes**. No other accommodations, such as striping or pavement markings, presently exist on these routes. Bike route signage is typically used to help bicyclists navigate the bicycle network and indicate roadways in which bicycle traffic is prioritized. Great Falls has two roadways, totaling approximately 6.6 miles, with bike route signage but no other bicycle accommodations.



4th and 8th Avenues North are signed as bike routes. Some of the signage is difficult to see through dense vegetation and old growth trees.

NATURAL SURFACE TRAILS

There are several natural surface trails in the study area. This type of facility can serve both transportation and recreational purposes. The RET is the most notable natural surface trail in the study area providing over 35 miles of gravel trails primarily used for single-track mountain bike riding and walking/hiking.

The RET provides a robust network of paths and trails along the banks of the Missouri River. The surface types vary along its length including asphalt, concrete, gravel, dirt, and composite surfaces.

SHARED USE PATHS

Shared use paths are off-street paved trails that are designated for the use of bicyclists, pedestrians, and other non-motorized users such as skateboarders and rollerbladers. The RET consists of over 20 miles of paved shared use path. A paved path was recently constructed adjacent to 24th Avenue South.

WIDENED SIDEWALKS

In the 1980s, the Great Falls City Commission began installing widened sidewalks (8 to 10 feet in width) to separate vehicular traffic from bicycle and pedestrian traffic. These widened sidewalks have since functioned as shared use paths. In 2018, the City passed an ordinance updating the City Code to indicated that, "unless otherwise allowed by designated City approved signage, or conditions render bicycle travel on a street unsafe, bicycles may only be ridden on those portions of the sidewalk that are a portion of the River's Edge Trail System," (Official City Code of Great Falls, 12.11.020). There are approximately 4.2 miles of widened sidewalks supplementing the shared use path network, some of which are located in south Great Falls and are neither designated as part of the RET nor signed as bike routes.

Some roadways in Great Falls have widened sidewalks that are intended to function as shared use paths although the legality of riding bicycles on sidewalks is limited to those sidewalks identified as part of the RET.

SIDEWALKS

There are standard width sidewalks alongside some of the main streets and within some of the subdivisions in the study area, however there are still many locations where the existing pedestrian facilities lack connectivity. In June 2017, the Great Falls Public Works Department completed an inventory of city sidewalks as part of the *Americans with Disabilities Act* (*ADA) Transition Plan*.[8] Their inventory indicates that there are over 600 miles of sidewalk within the city with over 5,600 corners. Approximately 63% of the curb ramps on these corners are non-compliant with ADA.

Most of the established residential and commercial areas of Great Falls have a cohesive and continuous sidewalk network. However, there are areas, primarily in suburban areas, where connectivity is lacking. The areas where most of the sidewalk gaps occur were subdivided and constructed prior to being incorporated into the city. Developers in unincorporated areas of Cascade County are not required to build sidewalks.

There are several miles of sidewalk gaps throughout the study area, primarily in areas that are outside the city or were recently annexed into the city.

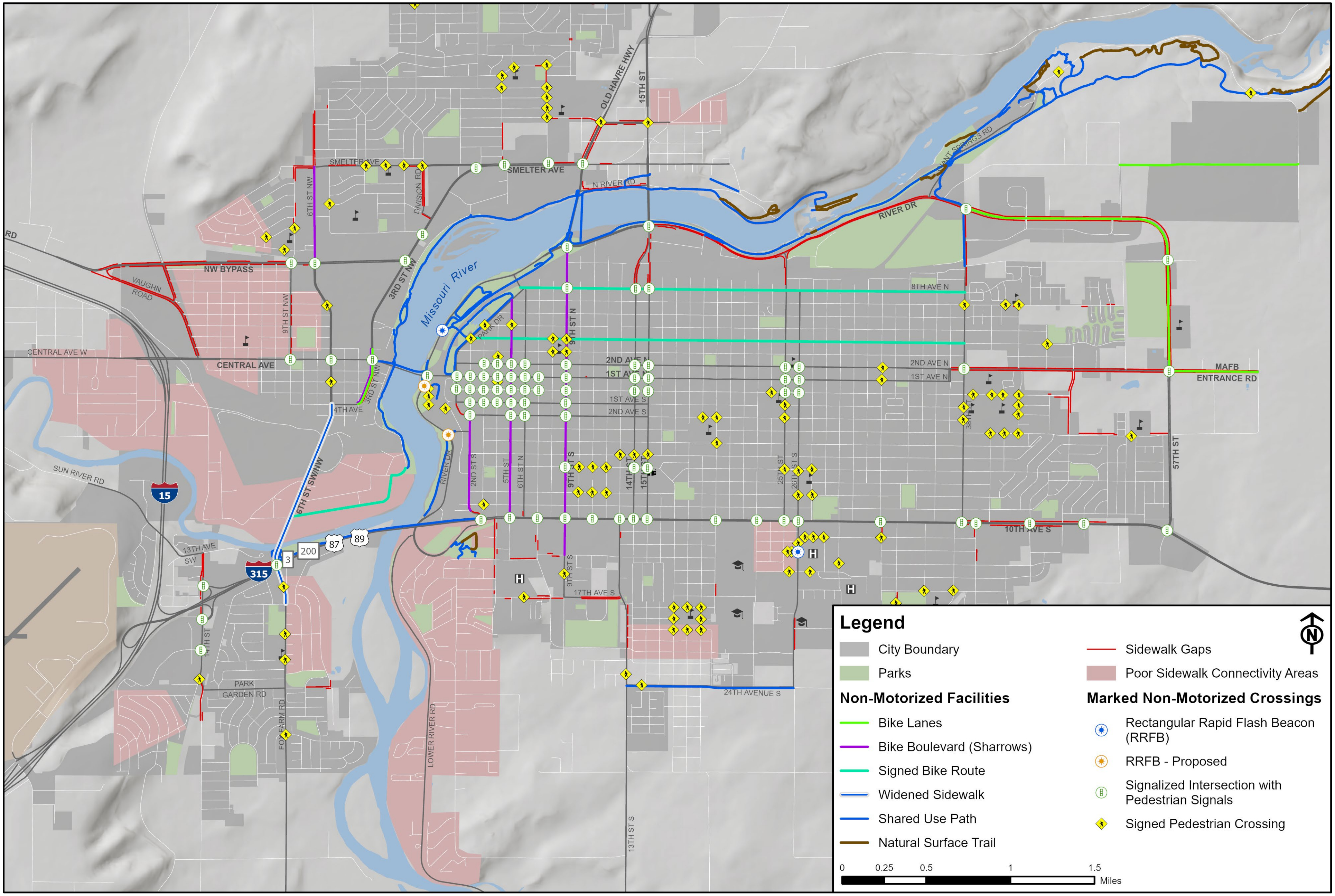


Figure 2.2: Non-Motorized Network

2.1.3. Local Transit Services

The Great Falls Transit District (GFTD) was established in 1978 to provide an alternative form of transportation for city and county residents in the Great Falls area. Funding for the district is provided through a combination of fare collections, property tax revenue, and federal funds. The latter is administered by MDT and goes towards operating and capital costs.

Since the creation of the GFTD, a variety of studies and plans have been created to assist the District with operations, improve financial sustainability, increase safety, and respond to customer needs. A comprehensive *Transit Development Plan (TDP)* was completed in 2010. The GFTD Board of Directors recently hired a consultant to update the TDP and the planning process kicked off in mid-September 2023.

SERVICE AREA

The GFTD covers a service area of 20 square miles primarily within the City of Great Falls. Many users have indicated that, as Great Falls continues to expand outward, transit services in their residential areas are limited, inconvenient, or unavailable. There are also many consumers located within a 100-mile radius of Great Falls who have problems accessing transportation from outlying areas to Great Falls, limiting access to jobs, education opportunities, medical facilities, shopping, recreation and special events in Great Falls. [9]

TRANSIT ROUTES

The GFTD currently operates seven regular fixed routes. The fixed routes operate from roughly 6:00 AM to 6:30 PM on weekdays and from 9:30 AM to 5:30 PM on Saturday. There is no transit service provided on Sundays or major holidays. Six of the seven routes, with the exception of Route 7-Southwest, operate on 30-minute headways during the morning and afternoon peaks (6:30 AM to 9:30 AM and 2:30 PM to 6:30 PM) to allow for increased coverage during school and commuter travel times. Saturday service is hourly on every line. The current operating hours may preclude people from job opportunities, with some users citing that the current hours allow them to get to work on time for their shift but they are unable to easily return home due to limited service hours and lack of affordable transportation opportunities.

The seven routes radiate from a timed-transfer point downtown at the Downtown Transfer Station located at 1st Avenue South and 4th Street. Routes 1 through 4 are scheduled to make a timed connection at 10th Avenue South and 57th Street South in the Walmart East parking lot, although Route 1 often arrives too late to make the timed connection. Routes 5 and 6 also make a timed connection at Division Road & 23rd Avenue NE. A map of the current routes is shown in **Figure 2.3**. The GFTD operates as a flag-down system and buses will stop at any street corner along the route that is deemed safe by the driver. Consideration of transitioning to a fixed stop system has been discussed internally at GFTD but has not been pursued yet.

PARATRANSIT OPERATIONS

All GFTD vehicles are mobility device accessible. The GFTD Paratransit Service also provides curb-to-curb transportation for individuals who are disabled and unable to use the fixed route system. Individuals must meet eligibility criteria, be within the service area, and carry a valid Medicare ID or Para ID issued by GFTD. Paratransit services are offered Monday through Friday from 6:00 AM to 6:30 PM and Saturdays from 9:30 AM to 5:30 PM. A single ride is $2.00 if booked in advance or $5.00 for same day service. Ride requests can be scheduled up to 14 days before the trip date. Pass booklets are available for $42.00 and contain 21 one-way passes. Many social service organizations purchase GFTD passes in order to meet the transportation needs of their clients.

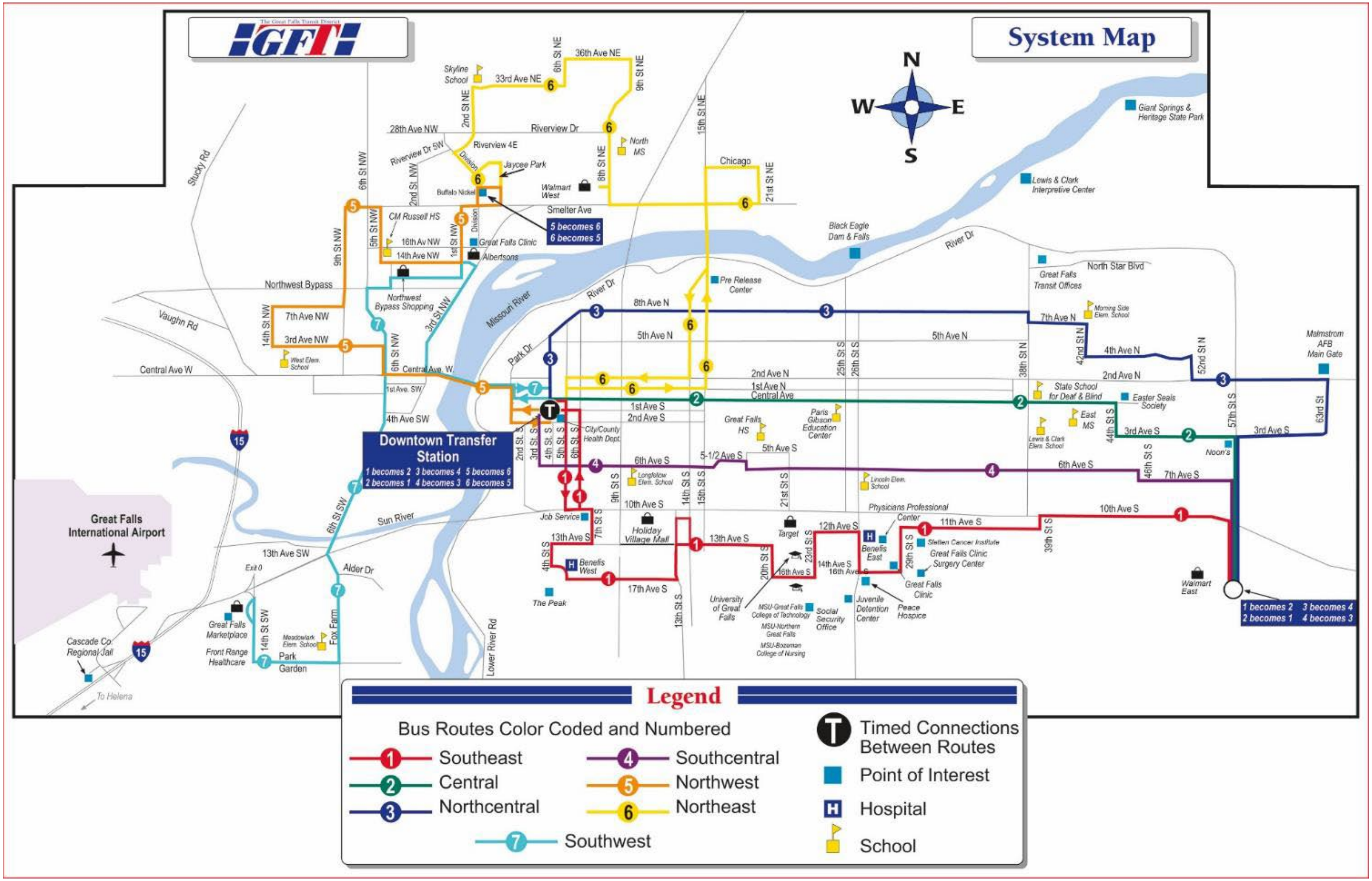


Figure 2.3: Existing Transit System Route Map

FARES

The transit services operate on a fixed fare basis. Passengers can either pay with exact change on the bus or obtain passes from the main transit office. All fares are for one-way trips. When a transfer between routes is required, a driver will issue a transfer slip to allow riders to complete their one-way trip from their initial fare. Transfers are valid for a limited time, approximately 5 minutes, and are free. The current transit rate schedule is shown in **Table 2.1**.

Table 2.1: Transit Rate Schedule (2023)

Fare / Pass	Single Ride	Day Pass	Punch Pass	Monthly Pass
Regular	$1.00	$4.00	$10.00 (11 Rides)	$30.00
Student (Full Time with ID)	$0.75	$4.00	$10.00 (15 Rides)	$25.00
Seniors (60+ yrs) / Disabled (with Valid ID)	$0.50	$4.00	$10.00 (21 Rides)	$21.00
Children (5 yrs & under)	FREE	N/A	N/A	N/A

Source: https://www.gftransit.com/fares-and-passes (accessed April 20, 2023)

CONNECTIVITY TO TRANSIT

Trips by transit often begin and end on foot or bicycle or both. When connectivity to transit is poor, ridership and ease of use of the system can be negatively affected. By improving sidewalks at and near bus stops, constructing bus shelters for waiting patrons, and planning routes near popular bicycling and walking routes, citizen connectivity to transit can improve. All GFTD buses now have bike racks mounted on the front of the bus as a convenience for bicyclists. The GFTD is also focusing on addressing connectivity to bus stops via sidewalks and other improvements to improve mobility for pedestrians using the transit system.

All GFTD buses are now equipped with bike racks to better serve riders.

RIDERSHIP

According to the National Transit Database, the GFTD provided 454,762 rides in 2019, approximately 10 percent of those rides were demand response trips from the paratransit offerings. In 2020, ridership decreased by nearly 50 percent, due to the COVID-19 pandemic.[10] MDT reports that ridership has rebounded slightly in recent years with 299,139 rides being provided by the GFTD in fiscal year 2022.[11]

2.1.4. Intercity Transit Services

There are several intercity transit providers that offer regional transit services to the Great Falls area. Intercity routes connect residents and visitors to destinations across Montana and more broadly to destinations across the US through these providers and others.

- **SALT LAKE EXPRESS**: In January of 2002, Great Falls began offering intercity bus service through Salt Lake Express. The Salt Lake Express intercity buses operate a daily fare-based route from Great Falls, south to Helena, then Butte, and continuing into Idaho.
- **NORTHERN TRANSIT INTERLOCAL**: In 2007, the Northern Transit Interlocal (NTI) was founded. NTI's Green Route operates a fare-free route between Cut Bank, Shelby, and Great Falls on Mondays and Thursdays.

- **NORTH CENTRAL MONTANA TRANSIT**: North Central Montana Transit (NCM) operates a free public transportation system serving the Hi-Line communities of Hill and Blaine counties as well as coordinated services with Fort Belknap and Rocky Boy's Transit systems. NCM Transit also offers a fare-based route between Havre and Great Falls on Mondays, Wednesdays, and Fridays.

2.1.5. Private Transportation Services

Great Falls also has several private transportation network companies and taxi services, including Uber, Lyft, BlackedOut 406 Taxi, Diamond Cab, and Godzilla406rides. These providers offer scheduled or on-demand door-to-door transportation services in the area.

2.1.6. Freight and Rail Network

Freight movement is critical to Montana's economy, providing access to important commodities, creating jobs, and encouraging investment and economic growth. Understanding how the freight and rail networks within the study area interact with the rest of the transportation network will help ensure that as the demand for goods and services fluctuates, other transportation modes can continue to move safely and efficiently through the transportation network. A detailed discussion about freight and rail systems in the Great Falls area is provided in the *Freight and Security Technical Memorandum* (**Appendix A**).

TRUCKS

Figure 2.4 illustrates the routes generally used by trucks in the Great Falls Area. Official truck routes to be used by through trucks (those that aren't providing local service) are identified in the City of Great Falls city code.[12] Typical truck routes include those that are outside the municipal boundary and connect to the official truck routes. The highest volumes of trucks traveling in the study area use I-15, presumably to access markets outside the region. Locally serving trucks appear to access the city via the NW Bypass or Central Avenue. From the southwest, trucks access the city on Country Club Boulevard and 10th Avenue South, which also provide access to commercial areas in the Downtown core. Trucks access the city via US 87 in the northeast, with connections to Smelter Avenue and River Drive. From the southeast, trucks enter along US 87 and 10th Avenue South.

RAIL

Great Falls is well-integrated into the Nation's freight rail system, with numerous facilities and services. Rail facilities carry freight on lines northeast of the city and along the east side of the Missouri River, crossing the river south of downtown. The rail lines connect to the BNSF rail yard just west of the river. Rail lines extend south and northwest from the rail yard. Great Falls is located on the 100-mile BNSF main line that links Shelby and Great Falls, known as "The Great Falls Subdivision". Shelby is also located along "The Hi-Line Subdivision", a BNSF main line that runs east-west. Shelby has advocated for a freight intermodal facility to support nearby goods movement routes. The rail facilities in Shelby also serve an Amtrak passenger rail station on the Empire Builder Route (Chicago to Portland/Seattle).[13]

Rail spurs connect the rail network to several industrial facilities in the Great Falls area, providing direct access to major goods movement facilities. **Figure 2.4** illustrates the rail lines serving the Great Falls Area. A circuitous railroad spur deviates from the area near the AgriTech Industrial Park, crosses the Missouri River just west of Rainbow Dam, and circles north and west to the Malteurop Malting Plant between US 87 and Black Eagle Road. This spur line is located outside the City of Great Falls but supports significant goods movement activity in and through the area. The city plans to continue constructing rail spurs to serve the AgriTech Industrial Park, generally located north of 18th

Avenue North and west of 57th Street North. In 2016, rail spurs were constructed as far east as Giant Springs Road/67th Street. Extensions east of 67th Street are anticipated to be designed and constructed as industrial development occurs in the area.

Based on geospatial data provided by MDT in 2021, there are currently 35 active, public, at-grade rail crossings within the Great Falls LRTP study area, as shown in **Figure 2.4**. These crossings primarily occur in the vicinity of the BNSF Rail Yard, the Agri-Tech Industrial Park, along the southern boundary of the study area, and in the northern core of Great Falls between 9th Avenue North, 25th Street North, River Drive, and 9th Street North. At-grade crossings can contribute to vehicle delay when trains are present and can contribute to safety concerns if proper warning devices and ample visibility are not provided.

Additionally, there are 10 grade-separated crossings within the study area including four overpasses and six underpasses. These crossings primarily occur along the major street network including 10th Avenue South, Central Avenue, 6th Street Southwest, and I-15. Grade-separated crossings can improve traffic conditions and safety by eliminating intermodal conflicts. In 2016, MDT conducted a study to assess highway-rail crossing needs across the state.[14] The evaluation process included a two-tiered screening and selection process to identify a list of at-grade and grade-separated crossings in need of improvements, including future grade separation. Two of Great Falls' grade-separated crossings, 1st Avenue North and 6th Street North, were identified as top priorities for improvements due to vertical clearance constraints, age, and changes in the number of railroad tracks. The River Drive South underpass was also included in the screening but dropped out during the first tier of screening due to the conclusion that it would be infeasible to make improvements to the crossing due to location and elevation of the roadway adjacent to the Missouri River. Although none of the at-grade crossings were advanced as statewide priorities, the need for continued evaluation of possible grade separation at locations such as River Drive at Giant Springs Road still exists.

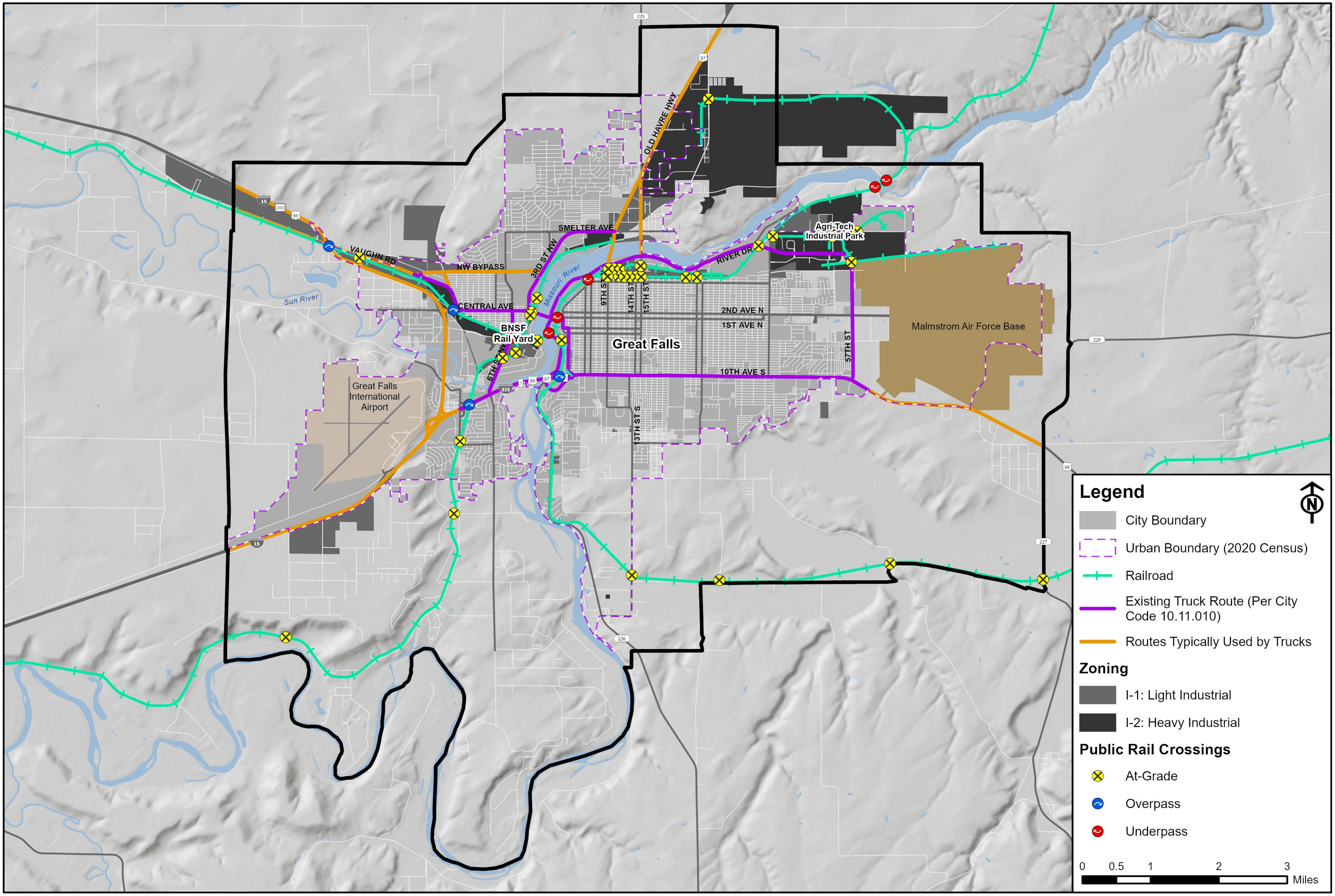


Figure 2.4: Freight and Rail Network

2.1.7. Electric Vehicle Network

Recent legislation has placed increased emphasis on alternative fuel vehicles, especially electric vehicles (EVs) and the role they will play in combatting transportation emissions. In Cascade County, there were 109 EVs on the road in 2022, which represents about 2.5 percent of the statewide total (4,555).[15]

Various infrastructure is required to support EVs on Montana roadways. Data available from the US Department of Energy Alternative Fuel Data Center indicates that Great Falls has 7 public electric vehicle charging stations, with 21 total ports. All existing charging infrastructure supports I-15, the only designated Alternate Fuel Corridor (AFC) in Great Falls. The AFC is pending completion of full buildout of EV charging infrastructure along the corridor. **Table 2.2** details the existing EV charging infrastructure in the Great Falls area identified by the Montana EV Infrastructure Deployment Plan[16] and the Alternative Fuels Data Center. The station data is gathered and verified through a variety of methods, and it is possible there are additional EV charging stations within the area not captured by this source.

FHWA has designated over 2,000 corridor miles as electric vehicle pending corridors in Montana. Montana's EV Plan prioritizes funding charging locations that meet the National Electric Vehicle Infrastructure Program (NEVI) requirements along each of these corridors.

Table 2.2: Existing Public EV Infrastructure in Great Falls

State ID	Charger Level	EV Corridor Supported	Address	Location	Charging Ports	EV Network
164271	L2	I-15	600 River Dr S	Best Western	2	ChargePoint
167373	L2	I-15	1000 3rd Street NW	North 40 Outfitters	2	ChargePoint
220467	L2	I-15	409 3rd Street NW	Citizens Alliance Bank	2	SemaCharge
231076	L2	I-15	800 Central Ave	Great Falls Subaru	1	Blink
302383	L2	I-15	3900 10th Ave S	City Motor Company	2	ChargePoint
163998	DC Fast	I-15	2301 14th St SW	Great Falls Hampton Inn	8	Tesla
114624	L2	I-15	421 3rd St NW	Spring Hill Suites	4	Tesla Destination

Source: Montana EV Infrastructure Deployment Plan Update, 2023; Alternative Fuels Data Center – Accessed November 15, 2023.

2.2. Transportation Conditions

An evaluation of traffic operations for the study area was completed using available data provided by the City of Great Falls, Cascade County, and MDT in addition to supplemental field-collected data. Turning-movement counts were conducted at 40 intersections within the study area during peak travel periods during the summer of 2023. Mainline traffic volume data for existing and historic conditions were available at several locations within the study area. Visual observations were also made for driver behavior, vehicle queuing, and general traffic characteristics during various field reviews. The following sections provide details about the existing traffic characteristics for the study area.

2.2.1. Existing Roadway Volumes and Capacity

Existing roadway traffic data were collected by MDT, the City of Great Falls, and Cascade County. The data were used to establish traffic conditions and to provide reliable data on historic traffic volumes. The existing facility size for the major street network is presented in **Figure 2.5**. Facility size is a qualitative observation of the number of travel lanes and physical divisions of the roadway. The existing Average Annual Daily Traffic (AADT) along the major street network is presented in **Figure 2.6.**

The capacity of the roadways is of critical importance when looking at the growth of the community. As traffic volumes increase, vehicle flow deteriorates. When traffic volumes approach and exceed the available capacity, users experience congestion and vehicle delay. As such, it is important to investigate the size and configuration of the existing roadways and compare their capacity to current demand. This helps determine if these roads need to be expanded to accommodate the existing or projected traffic demands, or if other parallel routes need to be improved to shift travel demand to currently underutilized facilities. The capacity of a roadway is based on various features including the number of lanes, intersection function, access and intersection spacing, vehicle fleet mix, roadway geometrics, and vehicle speeds. Individual roadway capacity varies greatly and should be calculated on an individual basis. However, for planning and comparison purposes, theoretical roadway capacities were developed based on the existing roadway configuration. **Table 2.3** presents the capacities, given in vehicles per day (vpd), that have been used for this work. The values given in the table are not intended to be used to set any thresholds for roadway performance, but rather provide general information to be used for comparison purposes.

Table 2.3: Theoretical Roadway Capacity

Road Configuration[a]	Capacity (vpd)[b]
2 Lane	12,000
2 Lane - Divided / TWLTL	18,000
3 Lane	18,000
3 Lane - Divided / TWLTL	24,000
4 Lane	24,000
4 Lane - Divided / TWLTL	32,000
6 Lane - Divided / TWLTL	48,000
Interstate	68,000

[a] TWLTL = Two-Way Left-Turn Lane
[b] Values represent planning level daily capacities developed for this Transportation Plan and are intended for comparison purposes only. Actual physical roadway capacity can vary greatly depending on road design features and access control.

A roadway's capacity, and associated volume-to-capacity (v/c) ratio, can be used as a comparison tool when looking at the transportation system. The v/c ratio of a roadway is defined as the traffic volume on the roadway divided by the capacity of the roadway. **Figure 2.7** presents the resultant v/c ratios for the existing major street network based on 2021 AADTs.

A v/c ratio that exceeds 1.00 is typically a sign that the volumes on the roadway are greater than the available capacity on the roadway. When this occurs, higher than normal vehicle delays are generally experienced. However, as mentioned previously, the theoretical roadway capacities are used for comparison purposes and actual physical roadway capacity can vary greatly. Consequently, the v/c ratios in **Figure 2.7** should be used to help identify potential capacity deficiencies in the transportation system.

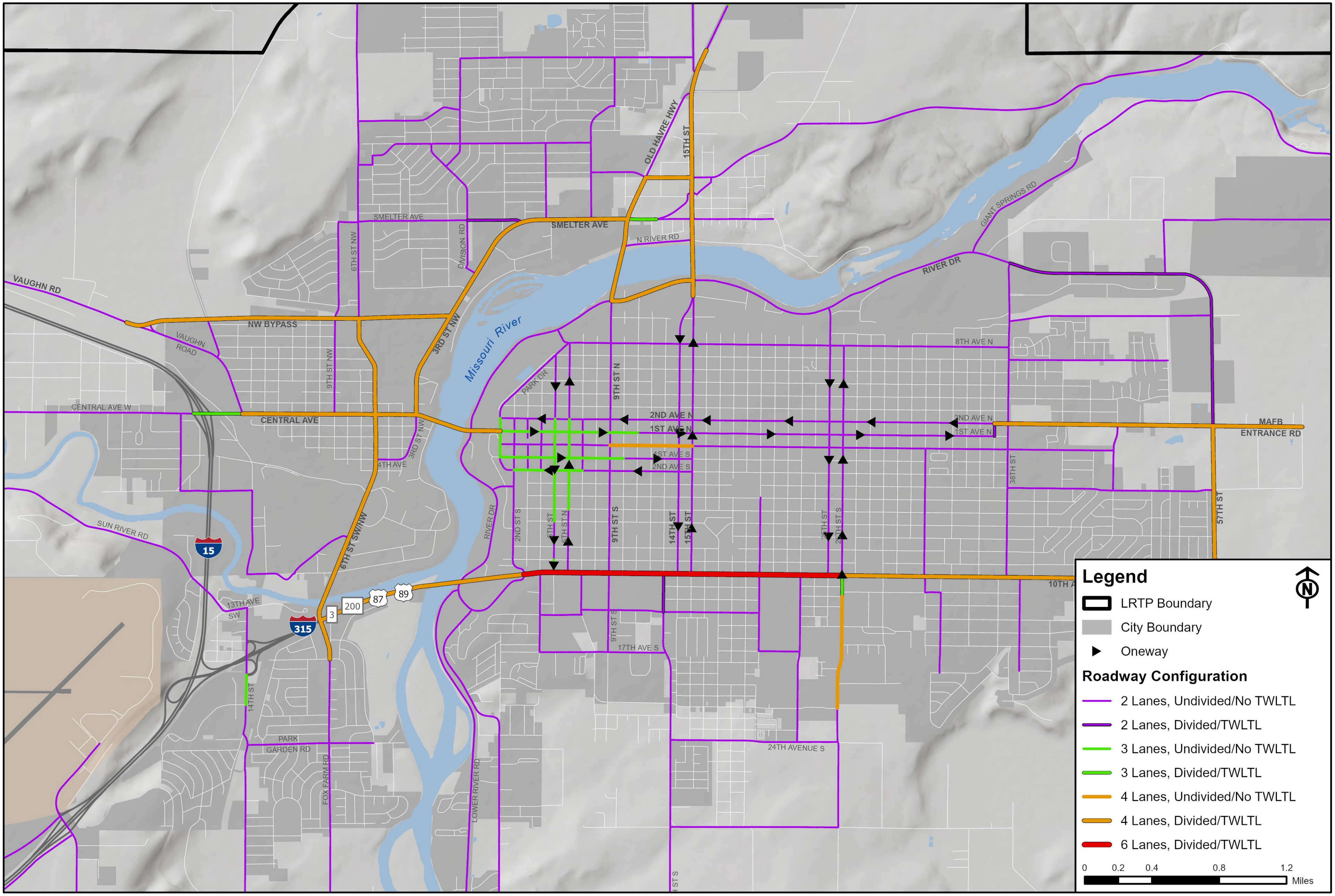


Figure 2.5: Existing Corridor Facility Size

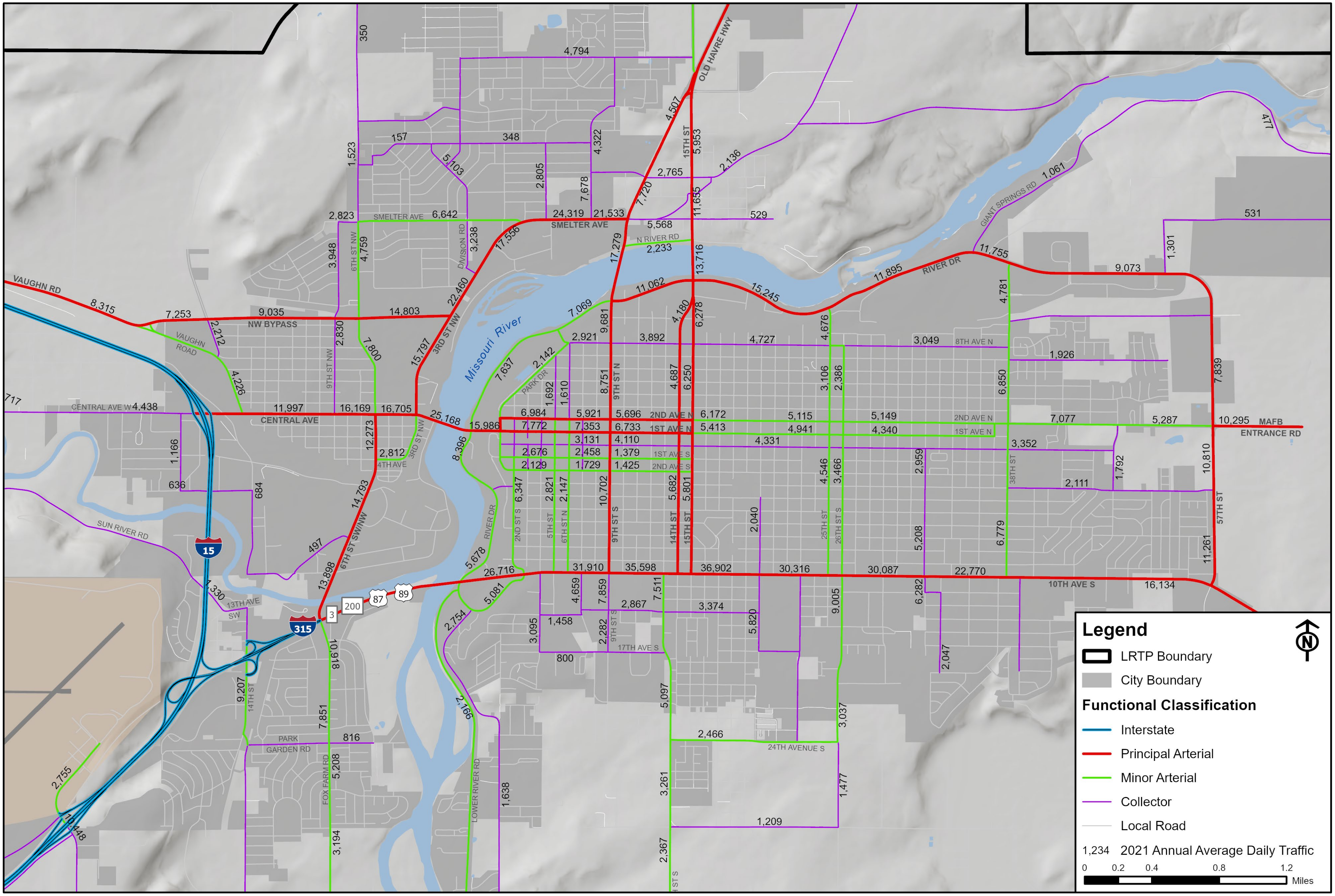


Figure 2.6: Existing AADT (2021)

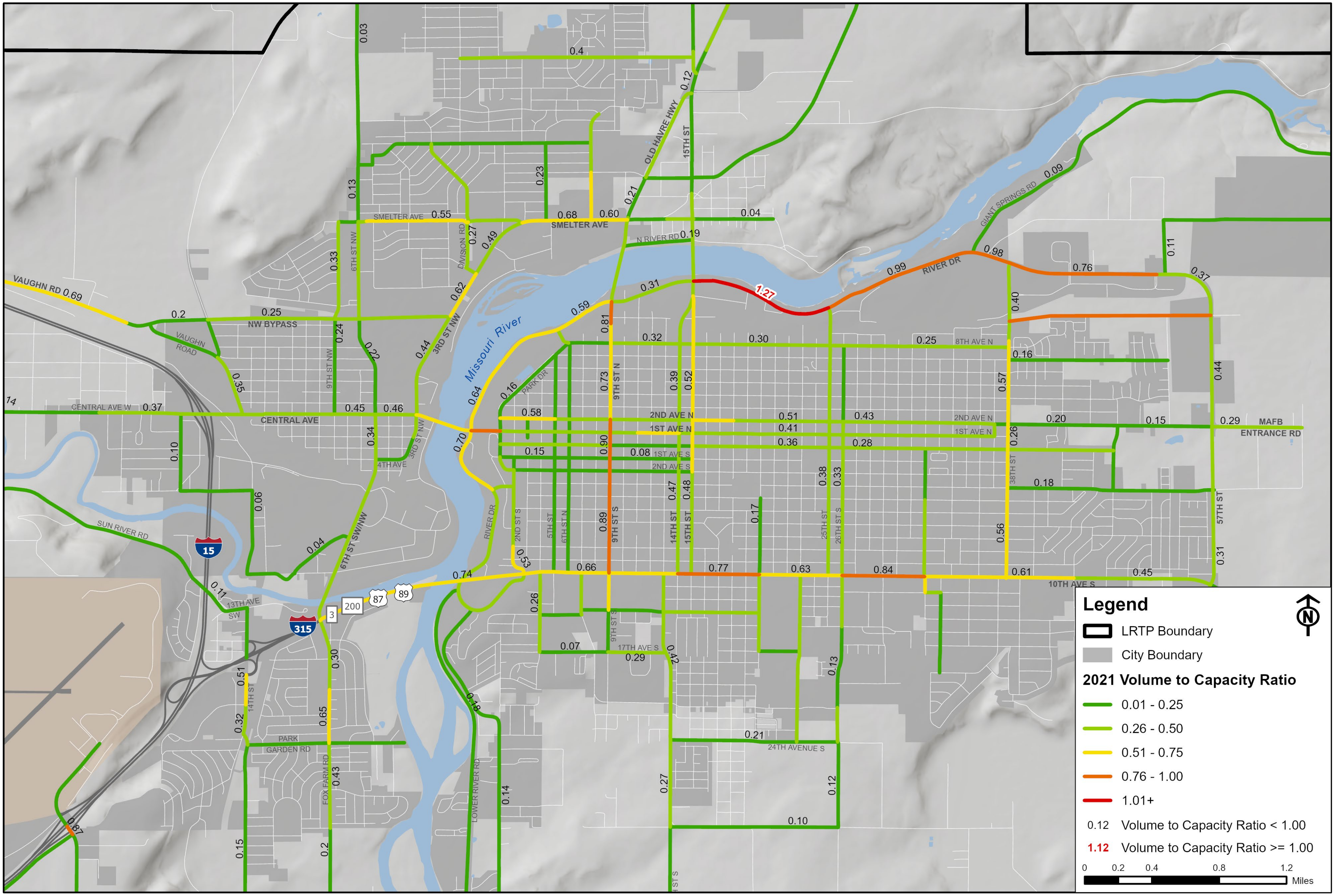
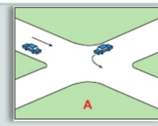
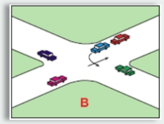
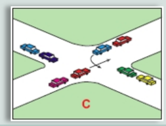
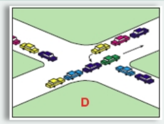
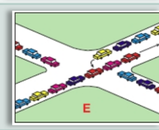
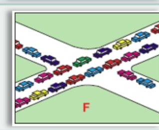


Figure 2.7: Existing Volume to Capacity Ratios (2021)

2.2.2. Intersection Operations

Intersection performance is evaluated in terms of vehicle delay. The amount of vehicle delay experienced at an intersection correlate to a measure called level of service (LOS). LOS is used as a means for identifying intersections that are experiencing operational difficulties, as well as a means for comparing multiple intersections. The LOS scale represents the full range of operating conditions. The scale is based on the ability of an intersection or street segment to accommodate the amount of traffic using the intersection. The scale ranges from "A" which indicates little, if any, vehicle delay, to "F" which indicates significant vehicle delay and traffic congestion. **Table 2.4** shows the relationship between LOS and operating conditions.

Table 2.4: Intersection LOS Descriptions

LOS	Intersection	Signalized Delay (sec)	Unsignalized Delay (sec)	Description
A		<10	<10	• Free flow • Low Volumes • <1 vehicle in queue • **Signalized:** most vehicles do not stop • **Unsignalized:** Very easy to find acceptable gap
B		10-20	10-15	• Mostly free flow • Somewhat low Volumes • Occasionally 1+ vehicles in queue • **Signalized:** vehicles clear in one green phase • **Unsignalized:** Very easy to find acceptable gap
C		20-35	15-25	• Smooth flow • Moderate Volumes • Standing queue of at least 1 vehicle • **Signalized:** Individual cycle failures may occur • **Unsignalized:** Acceptable gaps found regularly
D		35-50	25-35	• Approaching unstable flow • High volume/capacity ratios • Standing queue of vehicles upon arrival • **Signalized:** Individual cycle failures are noticeable • **Unsignalized:** Hard to find acceptable gap
E		50-80	35-50	• Unstable flow • Volumes at or near capacity • Standing queue of vehicles upon arrival • **Signalized:** Individual cycle failures are frequent • **Unsignalized:** Hard to find acceptable gap
F		>80	>50	• Saturation condition • Volumes over capacity • Standing queue of vehicles upon arrival • **Signalized:** Many individual cycle failures • **Unsignalized:** Very hard to find acceptable gap

The Transportation Research Board's *Highway Capacity Manual* (HCM) is the most widely used reference in determining the performance of existing roads and intersections, and for providing input into estimating future performance.[17] As such, the HCM methods are implemented in the LRTP intersection LOS analysis. Key inputs for the analysis include intersection layout, traffic volumes, traffic control, and signal timings. The observed volumes are adjusted by peak hour and seasonal adjustment factors and are used to calculate the ideal flow rate through the intersection. This flow rate helps calculate the true capacity of the intersection. With this information, total vehicle delay and LOS can be calculated for the intersection.

Data from various sources were compiled to display LOS for intersections in the study area. Intersections having poor operations or safety concerns were identified by the City as needing analysis and were therefore included herein. Data from recent traffic studies conducted by the City of Great Falls and MDT were also used to supplement the analysis. In total, 63 intersections have been included in the LOS analysis including 40 intersections with updated turning movement counts collected in Summer 2023 and 23 intersections with turning movement counts collected by other agencies between 2020 and 2023. Of these 63 intersections considered, 29 were signalized and 34 were unsignalized. Each intersection was analyzed for the morning and evening peak hours, defined as 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. **Figure 2.8** shows the intersections where peak hour turning movement counts are available.

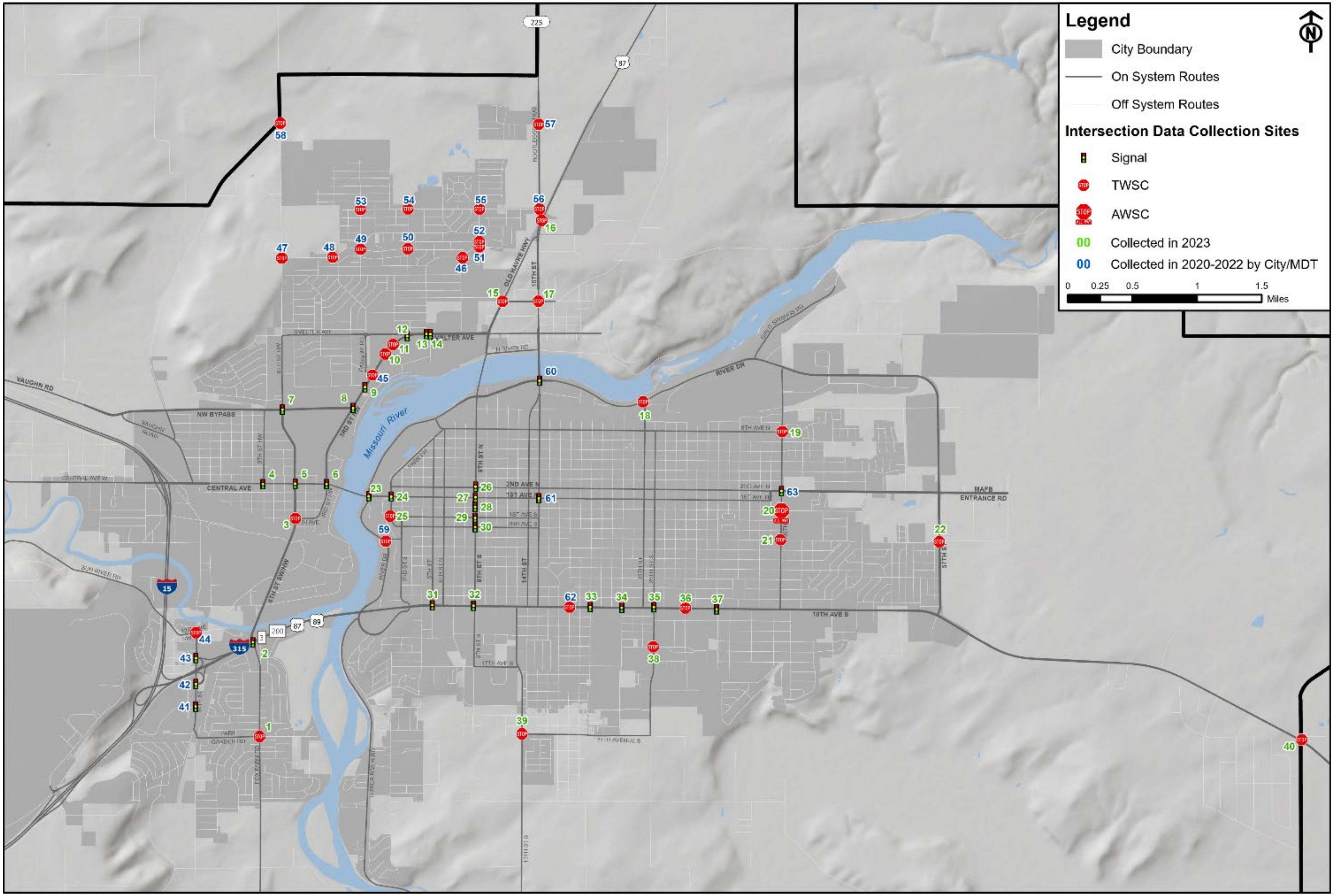


Figure 2.8: Intersection Data Collection Sites

Signalized Intersections

For signalized intersections, the LOS is based on the average stopped delay per vehicle; this relationship was shown previously in **Table 2.4**. The procedures used to evaluate signalized study intersections use detailed information on geometry, lane use, signal timing, peak hour volumes, arrival types, and other parameters. An intersection is typically considered to be functioning adequately if it is operating at LOS C or better during peak travel times.

Unsignalized Intersections

LOS for two-way stop (TWS) controlled intersections are based on the delay experienced by each individual movement within the intersections, rather than on the average stopped delay per vehicle at the intersection. This difference from the method used for signalized intersections is necessary since the operating characteristics and driver expectations at a stop-controlled intersection are substantially different. For TWS controlled intersections, the through traffic on the major (uncontrolled) street experiences little to no delay while vehicles on the minor streets typically experience longer delays. Vehicles on the minor street which are turning right or traveling across the major street generally experience less delay than those turning left from the same approach. Accordingly, the intersection delay and LOS are based on the average delay incurred at the worst performing movement.

For all-way stop (AWS) controlled intersections, LOS is based on average vehicle delay experienced at the intersection since all approaches are given similar opportunity to move through the intersection. This methodology is similar to that of signalized intersections.

Intersection Level of Service

For this analysis, intersections were analyzed on an individual basis. This means that LOS was determined based on the total number of vehicles traveling through the intersection during the peak hour. Consequently, intersection queues that form as a result of delay at nearby intersections may not be accounted for in this analysis.

The intersection of River Drive and 38th Street North is signalized.

The intersection of 10th Avenue South and 29th Street South is two-way stop-controlled.

Table 2.5 presents the LOS and average vehicle delay for the study intersections during the AM, noon, and PM peak hours. The existing intersection LOS is shown in **Figure 2.9**. Detailed results are provided in **Appendix B**. The data indicates that a handful of intersections are operating at or beyond their available capacity during peak hours under existing traffic conditions (LOS E and F). All of these intersections are unsignalized and may be candidates for a higher form of intersection control. Several other intersections experience LOS C or D during peak hours and may experience worsening conditions as growth occurs. These conditions primarily occur on major arterials such as 10th Avenue South, Fox Farm Road, 6th Street Northwest, 3rd Street Northwest, 38th Street North, Central Avenue, and 1st Avenue North.

Table 2.5: Existing Intersection Level of Service

ID	Intersection	Control*	AM Peak Delay (sec)	AM Peak LOS	PM Peak Delay (sec)	PM Peak LOS
01	Park Garden Rd/Fox Farm Rd	TWS	22.5	C	25.1	D
02	6th St SW/Fox Farm Rd/Country Club Blvd	Signal	54.1	D	41.2	D
03	6th St SW/4th Ave SW	TWS	28.7	D	35.3	E
04	9th St NW/Central Ave W	Signal	6.4	A	6.5	A
05	6th St SW/Central Ave W	Signal	21.1	C	21.7	C
06	3rd St NW/Central Ave W	Signal	33.9	C	50.4	D
07	6th St NW/Northwest Bypass	Signal	15.2	B	14.4	B
08	3rd St NW/Northwest Bypass	Signal	19.0	B	17.6	B
09	3rd St NW/14th Ave NW	Signal	12.5	B	12.4	B
10	3rd St NW/17th Ave NE	TWS	39.9	E	51.0	F
11	3rd St NW/4th St NE	TWS	13.2	B	13.7	B
12	3rd St NW/Smelter Ave NE	Signal	11.7	B	9.0	A
13	Smelter Ave NE/6th St NE (1)	Signal	11.7	B	9.5	A
14	Smelter Ave NE/6th St NE (2)	Signal	3.0	A	8.0	A
15	Old Havre Hwy/25th Ave NE	TWS	15.5	C	23.1	C
16	Bootlegger Trail/US 87	TWS	16.4	C	67.8	F
17	15th St NE/25th Ave NE	TWS	31.4	D	135.5	F
18	River Dr N/25th St N	TWS	30.3	D	87.7	F
19	8th Ave N/38th St N/Highwood Dr	TWS	15.3	C	25.2	D
20	Central Ave/38th St N	AWS	15.6	C	16.8	C
21	3rd Ave S/38th St S	TWS	30.2	D	20.8	C
22	3rd Ave S/57th St S	TWS	16.0	C	21.0	C
23	Central Ave/River Dr S/1st Ave N	Signal	25.0	C	50.7	D
24	1st Ave N/Park Dr	Signal	14.6	B	22.0	C
25	1st Ave S/Park Dr	TWS	9.8	A	10.2	B
26	9th St N/2nd Ave N	Signal	18.5	B	18.0	B
27	9th St N/1st Ave N	Signal	22.3	C	27.6	C
28	9th St N/Central Ave	Signal	15.3	B	30.3	C
29	9th St N/1st Ave S	Signal	8.5	A	8.8	A
30	9th St N/2nd Ave S	Signal	5.4	A	8.2	A
31	10th Ave S/5th St S	Signal	12.0	B	17.3	B
32	10th Ave S/9th St S	Signal	19.3	B	26.6	C
33	10th Ave S/20th St S	Signal	7.8	A	10.9	B
34	10th Ave S/23rd St S	Signal	6.5	A	29.4	C
35	10th Ave S/26th St S	Signal	14.0	B	20.9	C
36	10th Ave S/29th St S	TWS	28.7	D	26.9	D
37	10th Ave S/32nd St S	Signal	19.3	B	24.3	C
38	15th Ave S/26th St S	TWS	21.6	C	19.3	C
39	13th St S/24th Ave S	TWS	10.0	A	10.3	B
40	US 89/Highwood Rd/Stockett Rd	TWS	13.8	B	15.7	C
41	14th St SW/Market Place Dr	Signal	6.9	A	11.2	B
42	14th St SW/EB Ramps	Signal	9.4	A	10.3	B
43	14th St SW/WB Ramps/16th Ave SW	Signal	11.9	B	12.5	B
44	14th St SW/13th Ave SW	TWS	10.1	B	10.2	B
45	3rd St NW/16th Ave NW	TWS	14.9	B	18.8	C
46	8th St NE/Sacajawea Dr	TWS	11.8	B	11.9	B
47	6th St NW/Skyline Dr NW	TWS	9.2	A	9.4	A
48	Division Rd/Skyline Dr NW	TWS	8.8	A	9.4	A
49	2nd St NE/Skyline Dr NE	TWS	11.3	B	11.9	B
50	5th St NE/Skyline Dr NE	TWS	9.2	A	9.3	A
51	9th St NE/Skyline Dr NE	TWS	9.1	A	8.8	A
52	9th St NE/32nd Ave NE	TWS	9.9	A	8.7	A
53	2nd St NE/36th Ave NE	TWS	9.9	A	11.1	B
54	5th St NE/36th Ave NE	TWS	9.5	A	9.4	A
55	9th St NE/36th Ave NE	TWS	13.7	B	13.0	B
56	Bootlegger Tr/36th Ave NE	TWS	12.6	B	12.0	B
57	Bootlegger Tr/46th AVE NE	TWS	9.2	A	8.6	A
58	Vinyard Rd/6th St NW	TWS	8.6	A	8.4	A
59	River Dr S/3rd Ave S	TWS	9.1	A	10.3	B
60	River Dr N/15th St NE	Signal	35.7	D	39.9	D
61	1st Ave N/15th St N	Signal	8.6	A	15.0	B
62	10th Ave S/18th St S	TWS	915.0	F	1130.5	F
63	38th St N/2nd Ave N	Signal	9.0	A	9.4	A

**TWS = Two-Way Stop, AWS = All-way Stop*

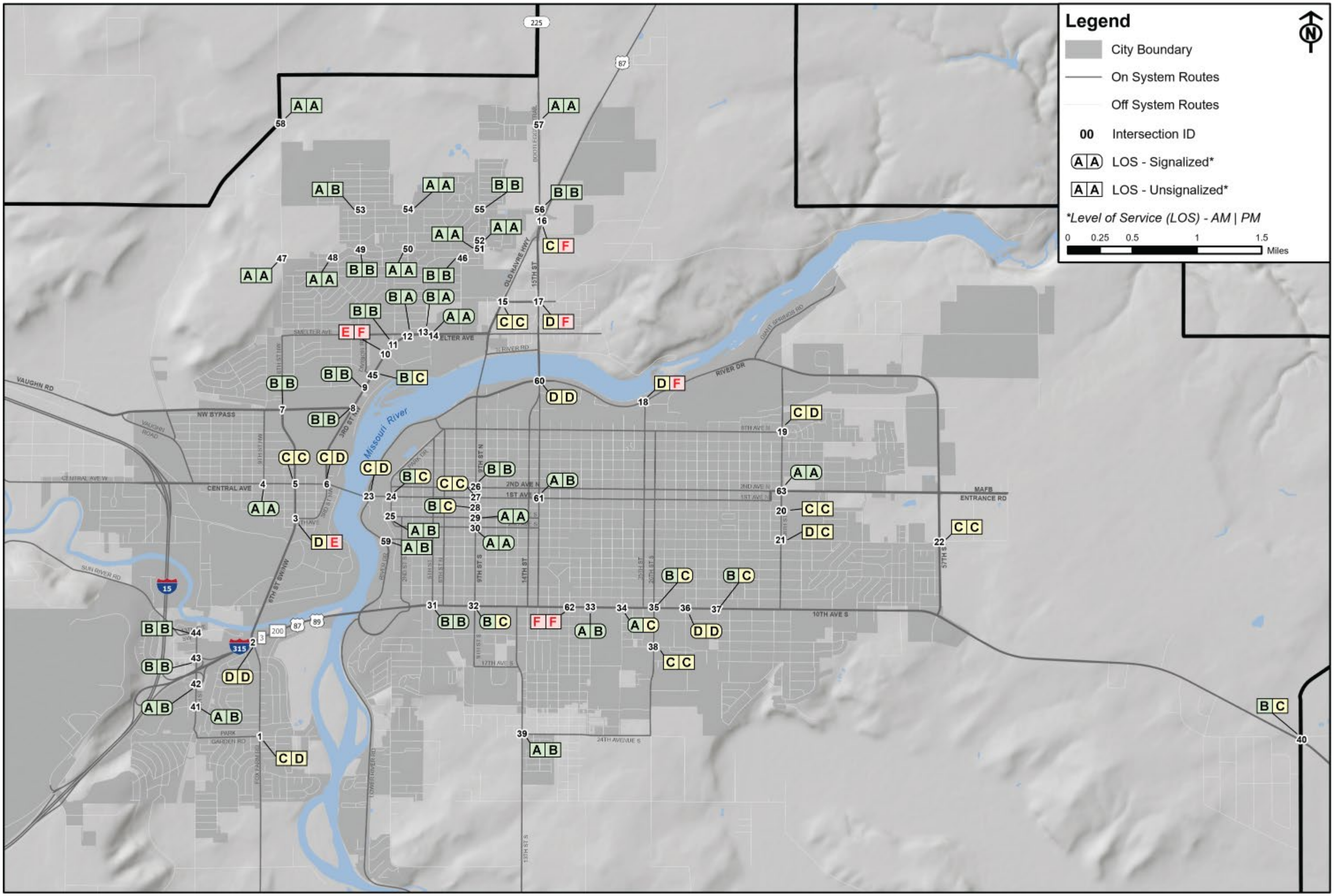


Figure 2.9: Existing Intersection Level of Service

2.2.3. Non-Motorized Transportation Conditions

Providing an accurate picture of pedestrian and bicycle activity within any community is difficult. Typically, data is not available or not comprehensive enough to form a complete picture of active transportation behavior. Data for vehicles is, by comparison, much more readily available. The following subsections summarize available data pertaining to active transportation.

JOURNEY TO WORK/COMMUTING (ACS) 2017-2021 DATA

The US Census has long been one of the only readily available sources of data to measure general levels of transportation choices. The data are limited to commute-based trips and do not reflect the spectrum of potential trip types available. The American Community Survey (ACS) has supplemented the 10-year cycle of the US Census to provide additional annual data. For smaller geographic areas with smaller sample sizes, annual data are not statistically valid, therefore five-year averages are used. This method provides some insight, however, it is slow to note changes over time. For walking and bicycling, the margins of error are relatively high. Estimates of the total share of workers who commute or work at home, the transportation modes used by commuters, and the mean travel times to work for commuters are presented in **Table 2.6** for workers in Cascade County, Great Falls, and the smaller study area communities.

Table 2.6: Commute Mode Share and Travel Time

Mode Share	Cascade County	City of Great Falls	Malmstrom AFB	Black Eagle
Walking	2.7%	1.8%	11.0%	8.9%
Biking	0.6%	0.7%	0.5%	-
Driving	89.3%	90.2%	84.1%	91.1%
Drove Alone	*79.8%*	*81.1%*	*67.6%*	*81.8%*
Public Transportation	0.8%	0.9%	0.6%	-
Worked from Home	5.7%	5.4%	3.9%	-
Mean Travel Time to Work (minutes)	**16.8**	**15.1**	**13.0**	**13.3**

Data: ACS Report, 2017-2021 (5-year estimates)

Commuting patterns have changed slightly when compared with those of the 2000 and 2010 Census. While the margin for error inherent in the ACS is significant, the inconsistency in the data makes it difficult to make any concrete conclusions about travel patterns. In 2000, the Census reported that 3.1 percent of Great Falls residents walked to work, 0.5 percent biked, and 1.0 percent used public transportation. In 2010, walking decreased to 2.7 percent while biking and public transportation increased to 0.8 and 1.7 percent, respectively. Trends in walking, biking, and public transportation have all seemingly decreased in the last decade (2010 to 2020; 1.8 percent walking, 0.7 percent biking, and 0.9 percent public transportation). Although the margin of error in this dataset is high, it is important to note this trend, especially considering that the city has seen a decrease in personal vehicle ownership over the last two decades (97.7 percent in 2010, 97.0 percent in 2000, and 96.3 percent in 2020). However, the city has seen an increase in workers who work from home (2.5 percent in 2000, 3.0 percent in 2010, and 4.7 percent in 2020) which decreases the number of commuters. The downward trend of non-motorized transportation users could be due to a larger number of households being constructed at a greater distance from destinations.

NATIONAL HOUSEHOLD TRAVEL SURVEY

Data from the 2017 National Household Travel Survey (NHTS) inventory provides information about personal travel behavior in the US, including mode choice and trip purpose. NHTS indicates that about 10.5 percent of person trips nationwide are made by walking while about 1.0 percent of person trips are made by bike and 1.5 percent of person trips are made by public bus services. NHTS indicates that for every one bike to work trip, there are another 1.5 utilitarian bike trips (shopping/errands, transporting others, medical or dental visits, meals, or other reasons), 0.5 bike to school trips, and 1.7 social or recreational trips. Overall, bike to work trips represent only approximately 12.5 percent of all bike trips nationally. It should be noted that approximately 42 percent of bike trips counted by NHTS are return home trips, indicating many bicyclists perform the initial part of their round trip by other means. While it is likely that travel patterns in the study area, particularly recreational based travel, do not match the national averages, it is very likely that the ACS commute mode share noted previously in **Table 2.6** underrepresents overall mode share in the study area.

The recently launched Next-Generation National Household Travel Survey (NextGen NHTS) provides a more continuous travel monitoring program with local data products including multimodal passenger and truck origin-destination information. Data for the Great Falls area indicates that about 84.9 percent of passenger trips are made via vehicle while about 14.8 percent are made via active transportation modes on a yearly basis. Of those trips made by vehicle, approximately 91.8 percent are less than 10 miles long. Of those trips made by active transportation modes, 99.9 percent are inter-zonal trips that start and end within the Great Falls area. Overall, work trips make up about 3.4 percent of all trips made within the Great Falls area. For truck trips, about 85.3 percent are inter-zonal trips. About 74.5 percent of truck trips are less than 10 miles long. Overall, there are approximately 46 passenger trips for every one truck trip within the Great Falls area.

WALK SCORE

Walkscore.com measures how “walkable” or “bikeable” a community is by measuring the availability of non-motorized facilities and connectivity to nearby amenities. The site indicates that Great Falls is a car-dependent city with most errands requiring a car. The site gives the city a walk score of 44 and a bike score of 43 (out of 100). The downtown area generally scores the highest in terms of walkability with scores decreasing in further parts of the city, as shown in **Figure 2.10**. By comparison, Bozeman has a walk/bike score of 47/62; Helena scores 49/45; Missoula scores 45/60; and Billings scores 35/47.

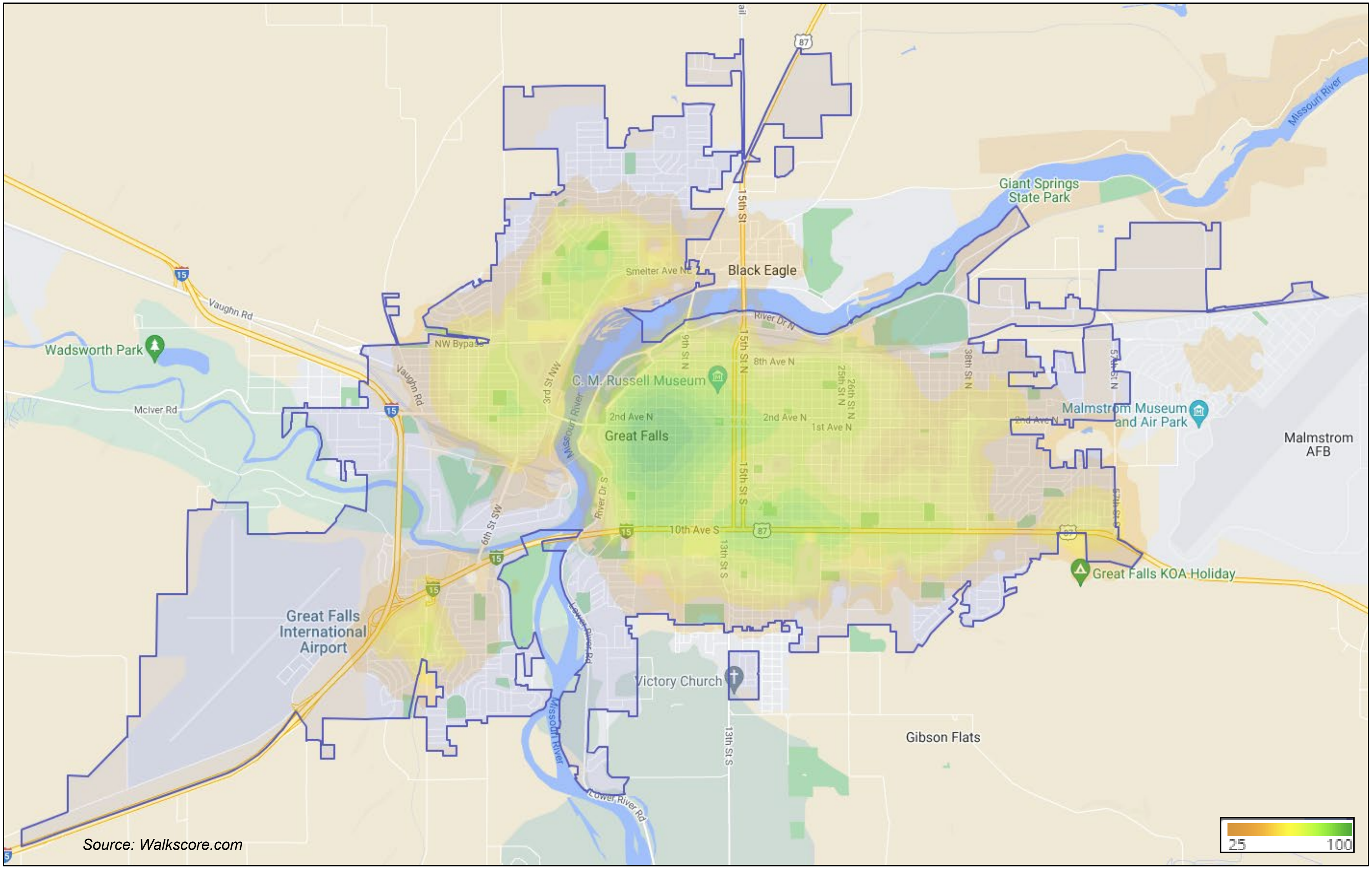


Figure 2.10: Great Falls Walk Score

2.2.4. Regional Travel Patterns and Trends

To understand travel patterns throughout the Great Falls area, field-collected data was supplemented with traffic data from StreetLight, an on-demand provider of traffic data collected from smart phones and navigation devices. StreetLight uses anonymized location records from these devices to infer individual trips that took place within a given geographic boundary and during a given time period. To ensure the data is accurate, Streetlight validates their data against census population estimates and traffic counts from permanent loop counters across the country. For this analysis, StreetLight data representing the 2022 calendar year was analyzed and trends for both passenger vehicles and commercial trucks were examined.

TEMPORAL TRAVEL TRENDS

Figure 2.11 illustrates the average number of trips taken by all vehicles (solid lines) and trucks (dotted lines) during each hour of the day categorized by weekdays (Monday – Thursday), weekends (Saturday & Sunday), and all days (Saturday – Sunday). The data includes all trips that either start or end in the Great Falls LRTP boundary, regardless of their destination or origin, respectively. It is important to note that the 'all vehicles' volume displayed in the figure also includes truck volumes. As shown in the figure, weekday traffic experiences distinct peaks during the morning (7:00 AM – 8:00 AM), midday (11:00 AM – 1:00 PM), and evening (4:00 PM – 6:00 PM) timeframes which align with typical commuting patterns. On weekends, traffic volumes are approximately 34 percent less than on weekdays with traffic increasing throughout the late morning, peaking around 12:00 PM, then decreasing throughout the remainder of the afternoon and evening. Truck volumes, on the other hand, peak around 8:00 AM on weekdays then decrease throughout the day with drops in traffic volumes during the evening commuting hours (5:00 PM). On weekends, truck traffic volumes are approximately 53 percent less than on weekdays with volumes increasing until approximately 11:00 AM then decreasing throughout the remainder of the day.

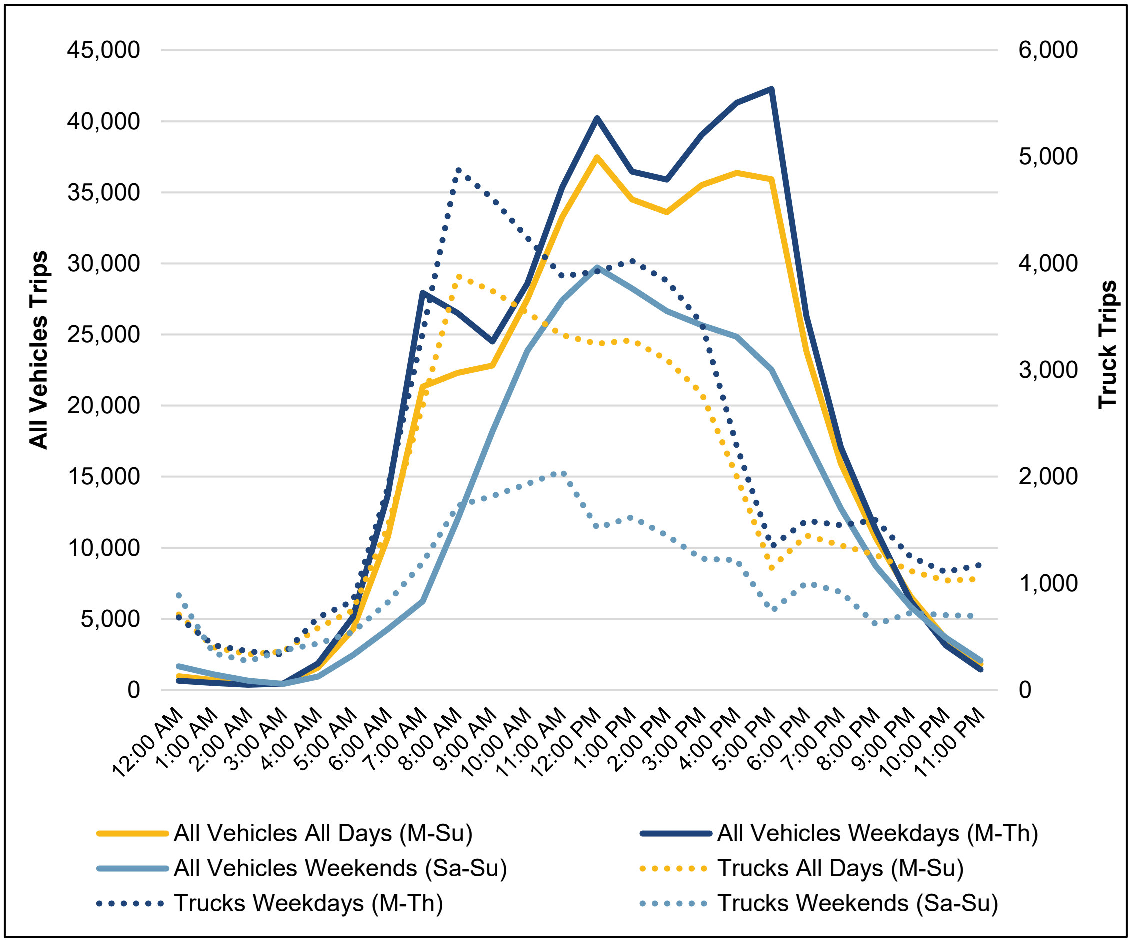


Figure 2.11: Hourly Traffic Patterns

Figure 2.12 summarizes the average number of daily trips for all vehicles and trucks during each month of the year. The figure indicates that more trips are taken in the Great Falls area during the late summer/early fall months (August and September) but otherwise experience little variation throughout the year. Trucks are also shown to peak in the late summer/early fall months as well as in February. Due to the agricultural nature of the majority of Cascade County, and its proximity to regional trade centers, it is possible that the increased number of trips during this time period could be related to fall harvests. For both all vehicles and trucks, there is little variation throughout the year on trips taken on weekends.

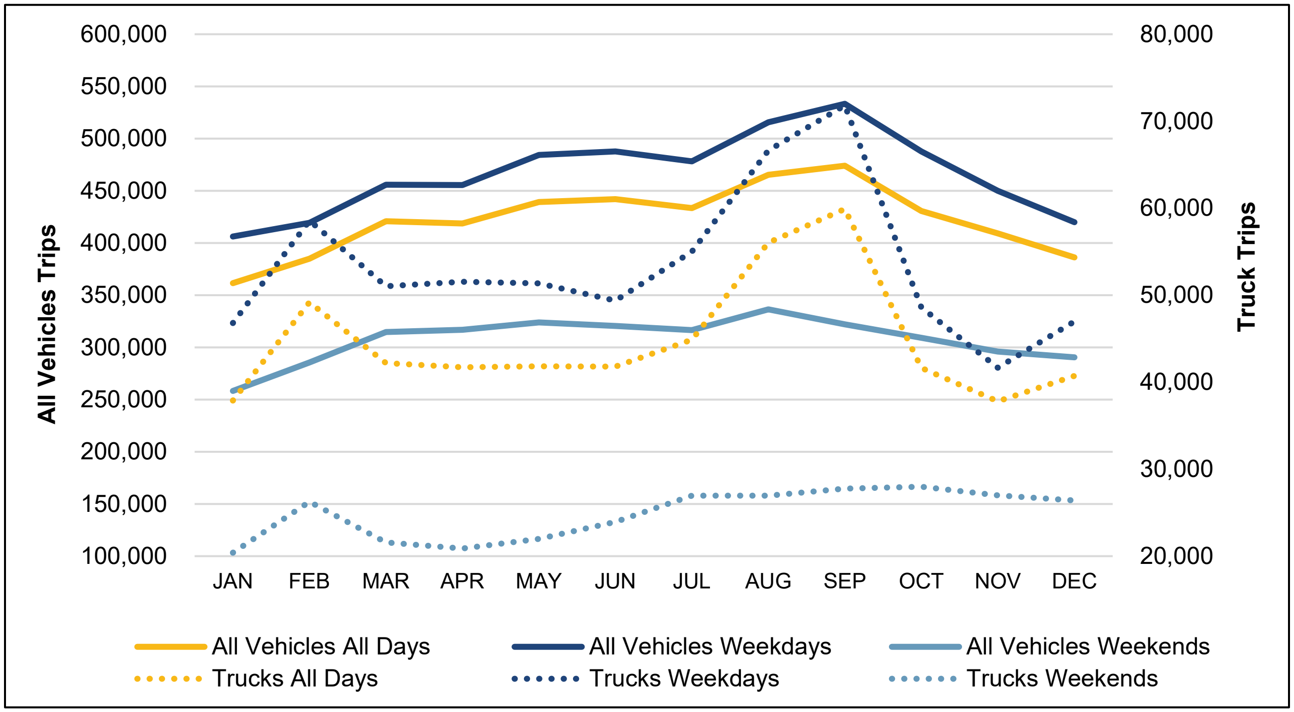


Figure 2.12: Monthly Traffic Patterns

TRIP CHARACTERISTICS

StreetLight also gathers information about trip characteristics including travel times, trips lengths, trip speeds, and trip circuity. **Figure 2.13** illustrates average trip lengths for all vehicles and trucks on an hourly basis while **Figure 2.14** illustrates trip lengths on a percentile basis. The travel time and travel speed results are highly correlated with trip length and are therefore not shown. As shown in **Figure 2.13**, average trip lengths for all vehicles range from approximately 12 miles to 23 miles long with the longest trips being observed in the early morning hours. Truck results also demonstrate a large increase in the trip lengths in the early morning hours, perhaps due to an increased frequency of long-distance regional trips during these hours.

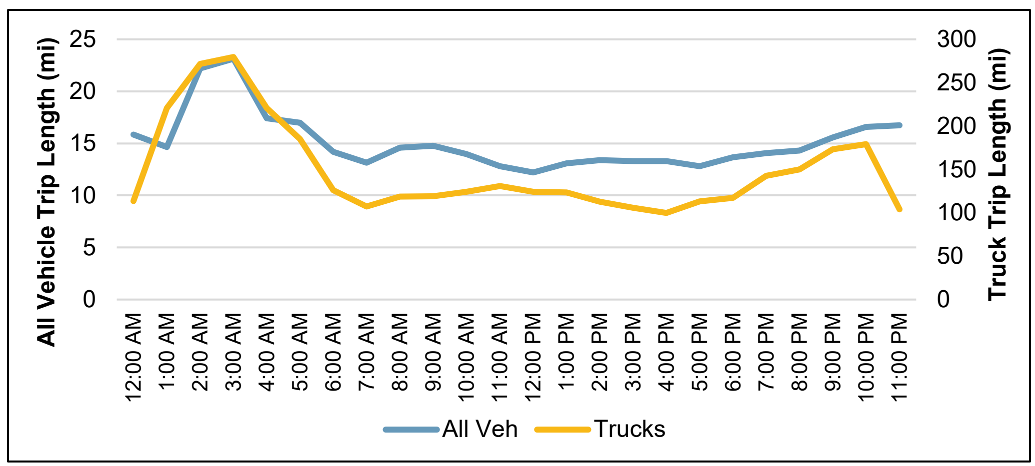


Figure 2.13: Trip Lengths by Hour

Figure 2.14 indicates that approximately 50 percent of truck trips are less than 10 miles long, presumably serving local needs, while about 50 percent of truck trips are longer than 10 miles presumably serving regional freight needs. When averaged with all vehicles, approximately 75 percent of all trips in the Great Falls area are less than 5 miles long, with over 30 percent being less than two miles long and nearly 10 percent being less than 1 mile long. Note, StreetLight's analysis methodology ends a 'trip' after a user's location doesn't move 5 meters in 5 minutes, so it does not necessarily account for trip chaining, or completing several shorter distance, nearby trips in one outing. It is, however, possible that increased investment in non-motorized infrastructure could shift some of these shorter vehicle trips to walking or biking trips in the future.

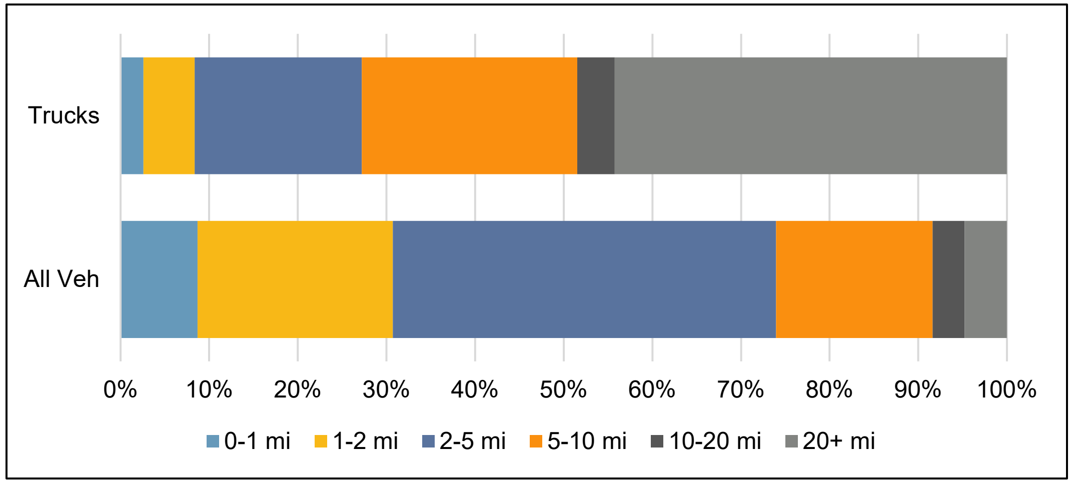


Figure 2.14: Trip Length Percentiles

Figure 2.15 illustrates trip circuity in the Great Falls area. Trip circuity is the ratio of vehicle distance traveled to direct travel distance. As shown in the figure, 100% of truck trips have a circuity ratio of 5 or less, with about 97 percent having a circuity ratio of 3 or less. When averaged across all vehicles, the frequency of trips with greater trip circuity ratios increases slightly. Still, about 87 percent of all vehicle trips have a circuity ratio of 2 or less, meaning 87 percent of trips are direct. Typically, in urban areas, trip circuity decreases as travel distance or travel time increases. For short, local trips, it is not uncommon to have larger circuity ratios as vehicles take out-of-direction trips to avoid bottlenecks and related congestion.

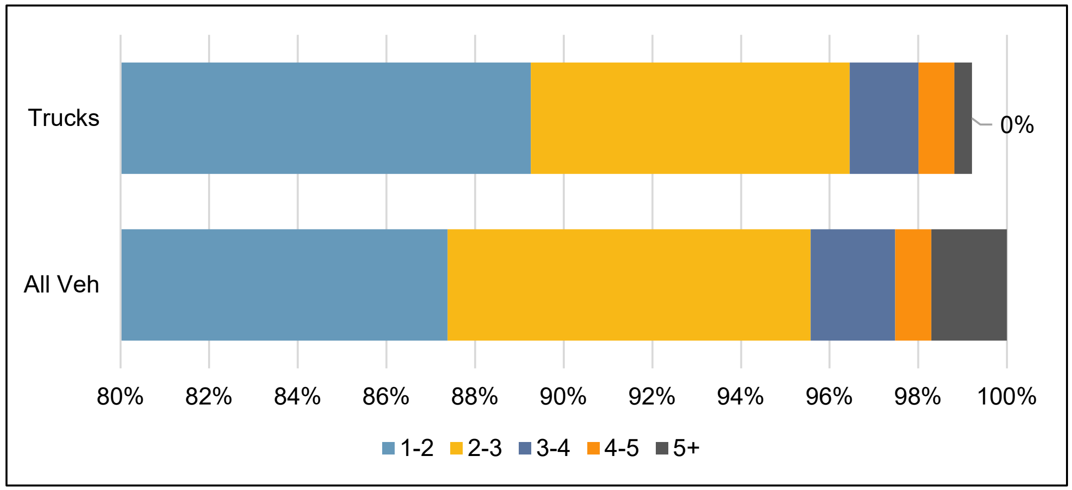


Figure 2.15: Trip Circuity

ORIGIN-DESTINATION

By tracking the start and end points of trips in the Great Falls area, StreetLight can provide valuable origin-destination data to help understand where trips are originating, where they are ending, and which pairs of origins and destinations are most popular. This can help identify travel routes between popular origin-destination pairs which may need additional investment as development occurs and traffic volumes increase. The origins and destinations used for this analysis are called traffic analysis zones (TAZs) and they are based on census tracts, aggregated to form larger areas with common land use patterns, as illustrated in **Figure 2.16**. An origin-destination matrix is provided in **Table 2.7** showing the number of trips between each of the 11 origins-destination pairs. Trips that start in a TAZ outside the Great Falls area but end their trip inside one of the Great Falls TAZs, or vice versa, are tabulated in the "somewhere else" column/row. The results represent the average number of trips taken on the average day by all vehicle types.

Table 2.7: Great Falls Origin-Destination Trips (Daily Average)

Destination ▶ / Origin ▼	Downtown	Midtown	Eastside Industrial	Malmstrom	Black Eagle - North	North Great Falls	Westside	Sun River	Airport - West	Fox Farm	Southside	Somewhere Else	Total Origin Trips
Downtown	**5,362**	4,590	789	491	905	2,290	4,607	347	674	3,197	6,564	2,406	**32,222**
Midtown	4,993	**7,237**	1,739	924	782	1,531	2,652	222	488	1,997	8,906	2,063	**33,534**
Eastside Industrial	869	1,693	**514**	370	253	392	676	56	67	326	1,570	689	**7,475**
Malmstrom	544	969	364	**4,489**	63	252	345	8	61	248	1,339	202	**8,884**
Black Eagle - North	881	697	253	71	**998**	1,005	1,809	137	345	631	989	594	**8,410**
North Great Falls	2,292	1,509	404	272	979	**2,566**	4,711	142	420	1,075	2,186	150	**16,706**
Westside	3,906	2,487	604	346	1,853	4,780	**8,819**	697	1,143	3,572	4,283	1,729	**34,219**
Sun River	348	224	60	9	132	150	687	**96**	89	424	413	132	**2,764**
Airport - West	677	475	79	78	358	351	987	79	**2,020**	968	975	1,518	**8,565**
Fox Farm	2,992	1,982	357	266	656	1,067	3,420	414	1,050	**7,002**	5,000	634	**24,840**
Southside	6,827	9,398	1,515	1,350	949	2,146	4,259	389	866	4,704	**17,376**	2,535	**52,314**
Somewhere Else	2,380	2,216	771	212	507	185	1,316	168	1,400	672	2,828	--	**12,655**
Total Destination Trips	**32,071**	**33,477**	**7,449**	**8,878**	**8,435**	**16,715**	**34,288**	**2,755**	**8,623**	**24,816**	**52,429**	**12,652**	**242,588**

As shown in **Table 2.7**, the Southside area has the most origin and destination trips while the Sun River area has the least. Approximately 6 percent of trips originating in the Great Falls area end in a destination outside the Great Falls area, similarly, about 6 percent of trips that end in end in the Great Falls area originated outside of Great Falls. A large percentage of trips travel between the Downtown, Midtown, and Southside areas on a daily basis. The Westside area accounts for the second highest number of trips with most trips traveling between the North Great Falls, Downtown, Southside, and Fox Farm areas.

The number of "internal capture" trips, or those that start and end within the same zone, are shown in **Table 2.7** in bold. For about half of all zones (excluding Midtown, Eastside Industrial, Black Eagle-North, North Great Falls, and Sun River), internal capture trips make up the majority of all trips originating in that zone. Malmstrom AFB has the largest percentage of internal capture trips, totaling about 51 percent.

The same origin-destination analysis was conducted for truck trips only. It was found that about 96 percent of all truck trips originating in the Great Falls Area ended outside the Great Falls area. Similarly, about 96 percent of truck trips that ended in the Great Falls area originated outside of Great Falls. This trend indicates that most truck traffic in the Great Falls area is regional freight traffic shipping goods either into or out of the Great Falls area. The greatest activity (about 15 percent) occurs in the Fox Farm area, which also covers the industrial areas on the south side of I-15, followed by the Airport (9 percent), Westside area (7 percent), and the Eastside Industrial Area (6 percent), all of which provide access to the air and rail components of the goods movement network.

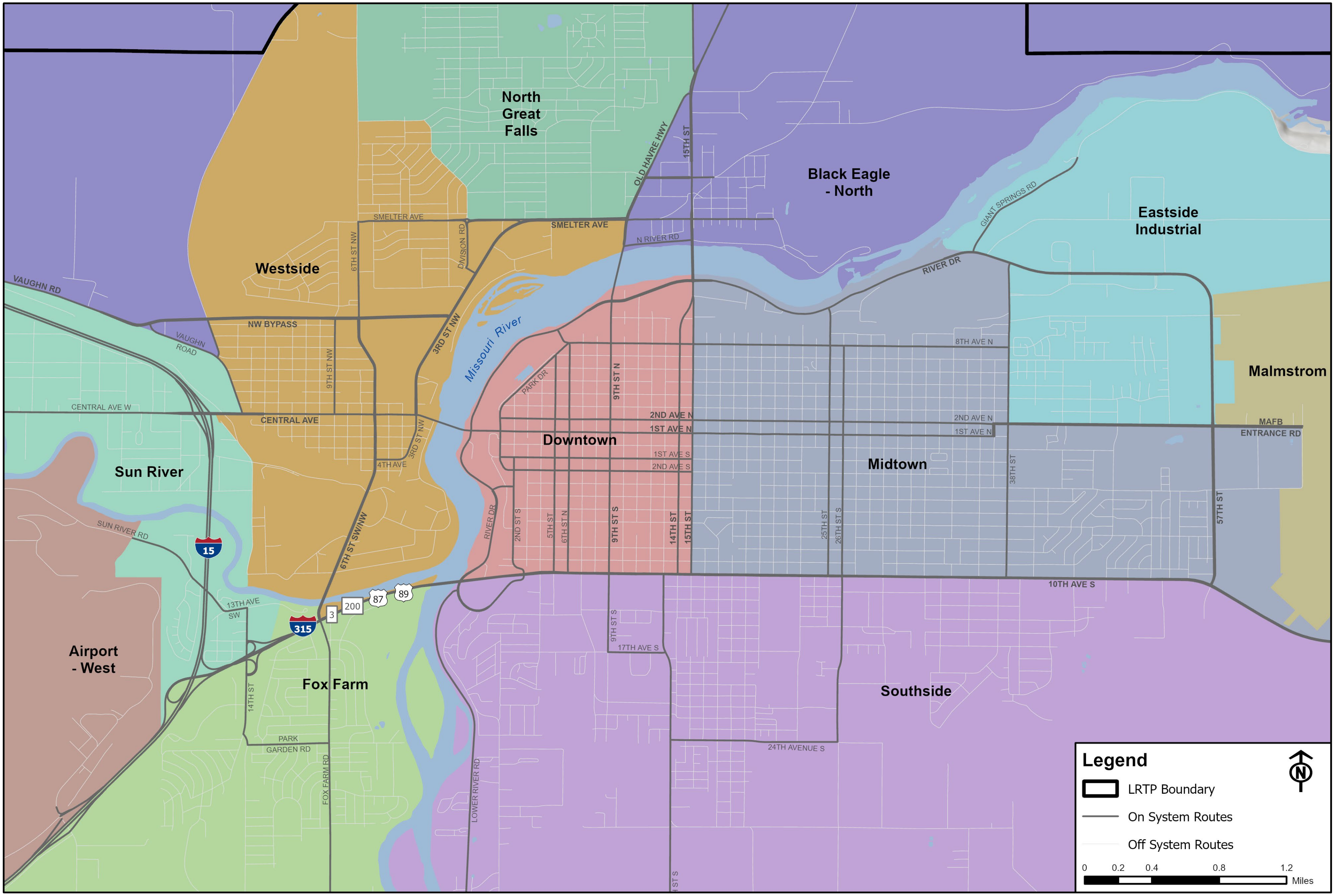


Figure 2.16: StreetLight Traffic Analysis Zones

TOP ROUTES FOR TRUCKS

To visualize and understand which routes are most used by trucks as they travel across Great Falls, a Top Routes analysis was performed. For this analysis, all the Great Falls TAZs (shown in **Figure 2.16**) were selected as inputs. The StreetLight system then scans the surrounding roadways for segments with the most heavy-duty truck traffic traveling between the TAZs. The results are shown in **Figure 2.17**.

The truck volumes in **Figure 2.17** are expressed in terms of the StreetLight Trip Index for heavy-duty vehicles, or trucks with four or more axles, weighing more than 26,000 pounds, and/or classified by FHWA as Class 7 or above. The StreetLight Trip Index is a metric used by StreetLight to represent a relative volume of trip activity but does not represent an estimated count of trips or vehicles. For truck data, the index is normalized by adjusting the number of trips in the data sample to the actual number of trips in a region around Sacramento, California, as derived from measurements published by the state of California. For all vehicle data, StreetLight performs a population-level normalization to adjust the data sample to more accurately portray actual conditions in the analysis region. Due to the differing methodologies for normalizing the indices, different modes are not comparable to one another. That said, it is difficult to deduce actual truck traffic volumes on the routes shown in **Figure 2.17**, especially not in comparison to passenger car volumes. **Figure 2.17** can, however, help visual which routes are most used by trucks and to what scale in comparison to other routes.

The Top Routes analysis indicates that the routes most heavily used by trucks within the study area include I-15, 10th Avenue South, Central Avenue, River Drive North, and 3rd Street Northwest, all of which are established truck routes as shown in **Figure 2.4**. Interestingly, River Drive South, Overlook Drive and 2nd Street South are also part of the existing truck routes, although they appear to carry much less truck traffic compared to other routes not on the established truck network. Smaller amounts of truck traffic are observed on east-west Downtown and Midtown routes including 1st and 2nd Avenues North, and 9th Avenue North, as well as north-south routes including 5th and 6th Streets North, 25th and 26th Streets North, and 38th Street North. The 14th and 15th Street corridors appear to be more heavily used than other north-south routes in this area. None of these east-west or north-south connections are known to be primary routes for trucks (such as Northwest Bypass, Vaughn Road, or 10th Street North as shown in **Figure 2.4**), though it is likely that majority of the truck traffic on these Downtown and Midtown routes serves local needs rather than regional needs.

This analysis can also be useful when identifying routes which may be less suited to accommodate bicycles or pedestrians due to the volume of heavy-duty trucks, or routes that may need geometric improvements to better accommodate the trucks that use them.

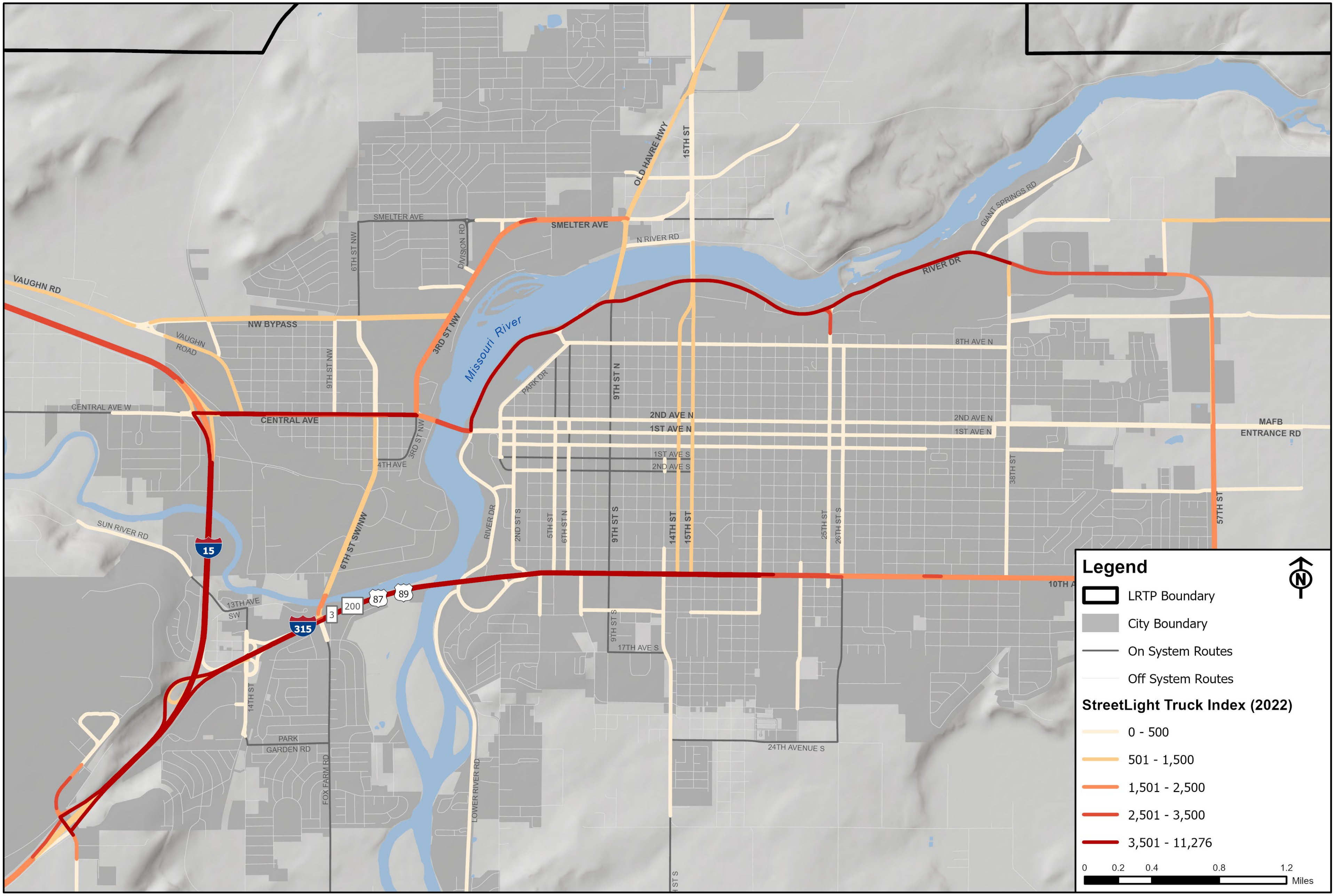


Figure 2.17: Top Routes for Heavy Trucks

2.3. Transportation Equity

To address underinvestment in disadvantaged communities, the US Department of Transportation (USDOT) developed the Justice40 Initiative (J40). The initiative helps transportation agencies identify and prioritize projects that benefit communities facing barriers to affordable, equitable, reliable, and safe transportation. In accordance with J40, the USDOT developed the Equitable Transportation Community (ETC) Explorer which provides data that allows agencies to understand how a community is experiencing transportation disadvantage based on five components of disadvantage including:

- **Transportation Insecurity** occurs when people are unable to get to where they need to go to meet the needs of daily life regularly, reliably, and safely. A growing body of research indicates that transportation insecurity is a significant factor in persistent poverty.
- **Environmental Burden** measures factors such as pollution, hazardous facility exposure, water pollution, and the built environment. These environmental burdens can have far-reaching consequences such as health disparities, negative educational outcomes, and economic hardship.
- **Social Vulnerability** is a measure of socioeconomic conditions that have a direct impact on quality of life including lack of employment, educational attainment, poverty, housing tenure, access to broadband, and housing cost burden as well as identifying household characteristics such as age, disability status and English proficiency.
- **Health Vulnerability** assesses the increased frequency of health conditions that may result from exposure to air, noise, and water pollution, as well as lifestyle factors such as poor walkability, car dependency, and long commute times.
- **Climate and Disaster Risk Burden** reflects sea level rise, changes in precipitation, extreme weather, and heat which pose risks to the transportation system. These hazards may affect system performance, safety, and reliability. As a result, people may have trouble getting to their homes, schools, stores, and medical appointments.

The ETC Explorer calculates the cumulative impacts of each disadvantage component across each census tract and uses percentile rankings to determine each census tracts component score against all other census tracts both nationally and on a statewide basis. USDOT considers a census tract to be experiencing transportation disadvantage if the overall index score places it in the top 65 percent of all US census tracts.

When comparing to the Nation as a whole, approximately 68 percent of Cascade County is considered disadvantaged, with the majority of disadvantaged census tracts being located within the Great Falls LRTP planning area. On a statewide basis, approximately 19 percent of the Great Falls MPO is considered disadvantaged. Overall, the Great Falls MPO ranks relatively high in the Environmental Burden (82%), Climate and Disaster Risk Burden (66%), and Health Vulnerability (66%) components but ranks the lowest in the Transportation Insecurity component (29%) when compared to the rest of Montana. When compared to the rest of the nation, however, Cascade County ranks the highest in Transportation Insecurity (81%) and lowest in Climate & Disaster Risk Burden (35%).

Figure 2.18 illustrates the ETC Explorer results for the Great Falls area identifying disadvantaged census tracts, based on both national and statewide comparisons, as well as the Transportation Insecurity percentile ranking on a statewide basis. As shown in the figure, the area generally bounded by 10th Avenue South, River Drive, and 38th Street North is ranked relatively low in terms of Transportation Insecurity with Transportation Insecurity increasing in further reaches of the city and in the county. Areas with higher Transportation Insecurity scores are characterized by longer commute times and limited access to personal vehicles or transit, spend a greater percentage of household income on transportation, and experience higher rates of fatal crashes.

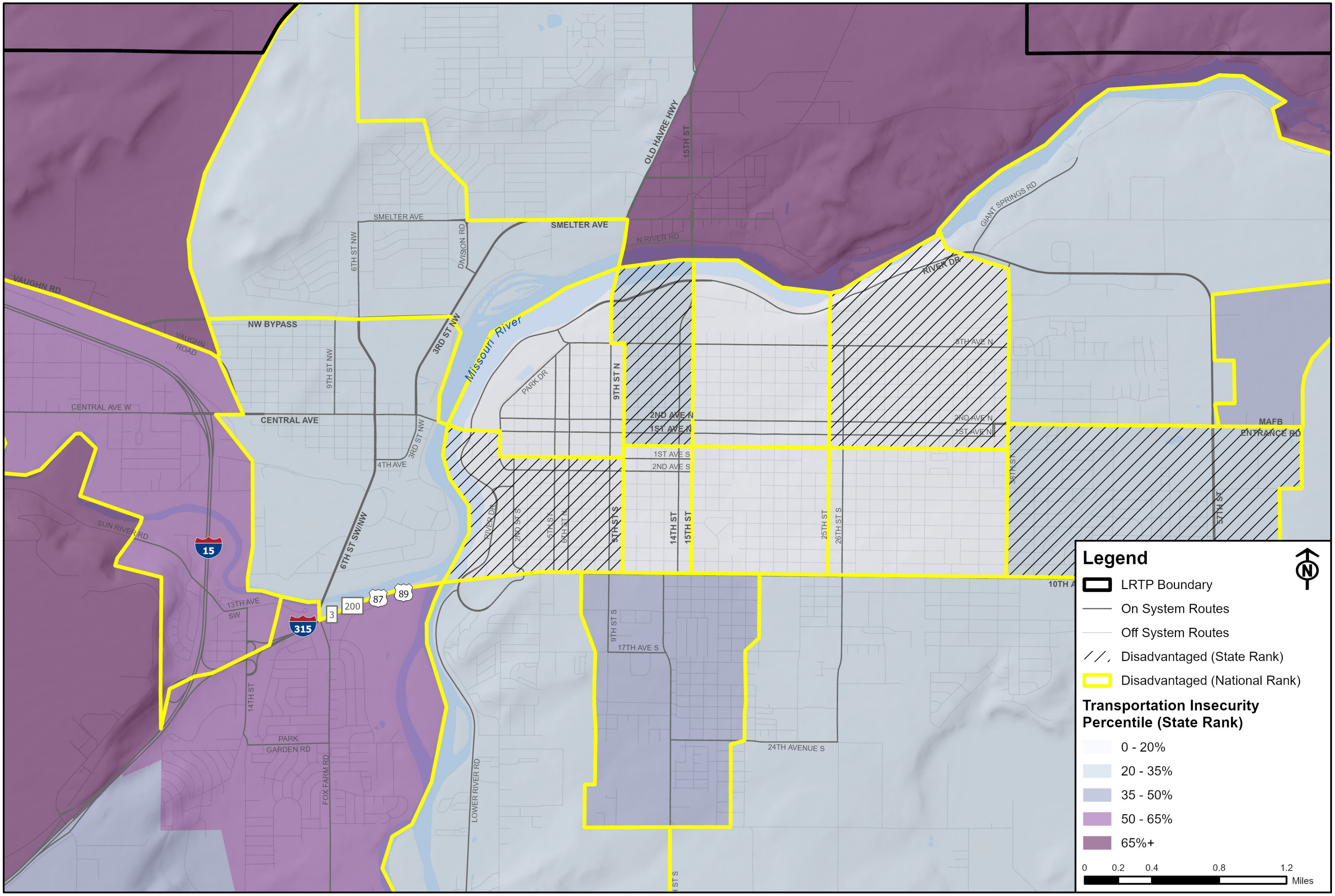


Figure 2.18: Transportation Equity

2.4. Asset Condition

Effectively managing transportation assets is a vital part of ensuring good condition and performance for all transportation users. Two assets that are often monitored by transportation agencies include structures (bridges, culverts, stock passes, tunnels, etc.) and pavement. Condition and performance ratings for these assets are important to consider when planning preservation, rehabilitation, and reconstruction projects. The following sections summarize the existing conditions of the structures and pavement within the study area.

STRUCTURE CONDITION

MDT performs regular condition inspections of all in-service publicly owned structures in accordance with the National Bridge Inspection (NBI) Standards. However, inspection and condition data are not always available for pedestrian or railroad bridges that are owned by other entities such as cities, counties, or railroads. All inspections are entered into Montana's Structure Management System database. This information is used to identify structures needing repair and inform funding decisions.

NBI item ratings are determined based on MDT inspections, and vary on a scale from 0-9, with 0 depicting an element that is out of service and beyond corrective action (repair) and 9 depicting an item that is new or in excellent condition. An overall structure rating is given based on the lowest substructure or superstructure rating for the structure. **Table 2.8** tabulates the structural ratings for the bridges in the study area based on the structure owner. **Figure 2.19** shows the structures within the study area color-coded based on their overall structural rating.

The westbound section of the Warden Bridge, on 10th Avenue South spanning the Missouri River, is in poor condition while the eastbound section is in fair condition and has been noted as needing repair or replacement.

As shown in **Table 2.7**, there are 43 structures within the study area, of which 31 are owned and maintained by MDT. The remaining 12 bridges are owned and maintained by the City of Great Falls (5), Cascade County (2), and the BNSF Railroad (5). Two of the MDT-owned bridges received an element rating of 4 or less. All other bridges in the study area received a rating of 5 or higher for all elements and about 50 percent of the bridges have an overall structure rating of good.

Table 2.8: Great Falls Study Area Structure Ratings

Structure Owner	Total Structures	Overall Structural Rating				
		New (9)	Good (7-8)	Fair (5-6)	Poor (4 or Less)	Not Available
City of Great Falls	5	--	2	1	--	2
Cascade County	2	--	1	1	--	--
MDT	31	--	19	10	2	--
Railroad	5	--	--	--	--	5
Sum	**43**	**--**	**22**	**12**	**2**	**7**

PAVEMENT CONDITION

The pavement condition index (PCI) is a numerical index between 0 and 100, which is used to indicate the general condition of a pavement section. The PCI is widely used by municipalities to measure the performance of their road infrastructure. The PCI rating assessment is based on visual surveys performed by county staff. Each segment of road is evaluated based on the number, type, and severity of distresses in the pavement. Pavement distress types for asphalt pavements include cracking, bleeding, swelling, raveling, rutting, potholes, patching, and ride quality, among others. A PCI score of 86-100 is rated as “good,” 71-85 as “satisfactory”, 56-70 as “fair”, 41-55 as “poor”, and 25-40 as “very poor”. Any PCI rating below 25 is considered failing.

The PCI history of a pavement section can help establish its rate of deterioration and identify future major rehabilitation needs. PCI values are also typically used in prioritizing, funding and executing maintenance and repair efforts. **Figure 2.19** shows the PCI values reported by the City of Great Falls Public Works Department in 2019 and updated sporadically in the past 3 years. Approximately 11.3 miles of roadways are classified as failing, about 10.5 miles are reported as very poor, and about 13.8 miles are in poor condition. These segments are candidates for major rehabilitation or reconstruction. The majority of the network, about 343 miles, is reported as being in fair condition. These segments are candidates for pavement preservation efforts. About 60.7 miles of roadway within the study area is considered to be in satisfactory or good condition. The city is planning to conduct a full pavement inventory in 2024 to re-establish baseline conditions and help inform future investment decisions.

The city routinely evaluates the condition of city streets to determine what, if any, maintenance must be performed. The Public Works Department finds that periodic maintenance is more efficient and cost-effective than full reconstruction.

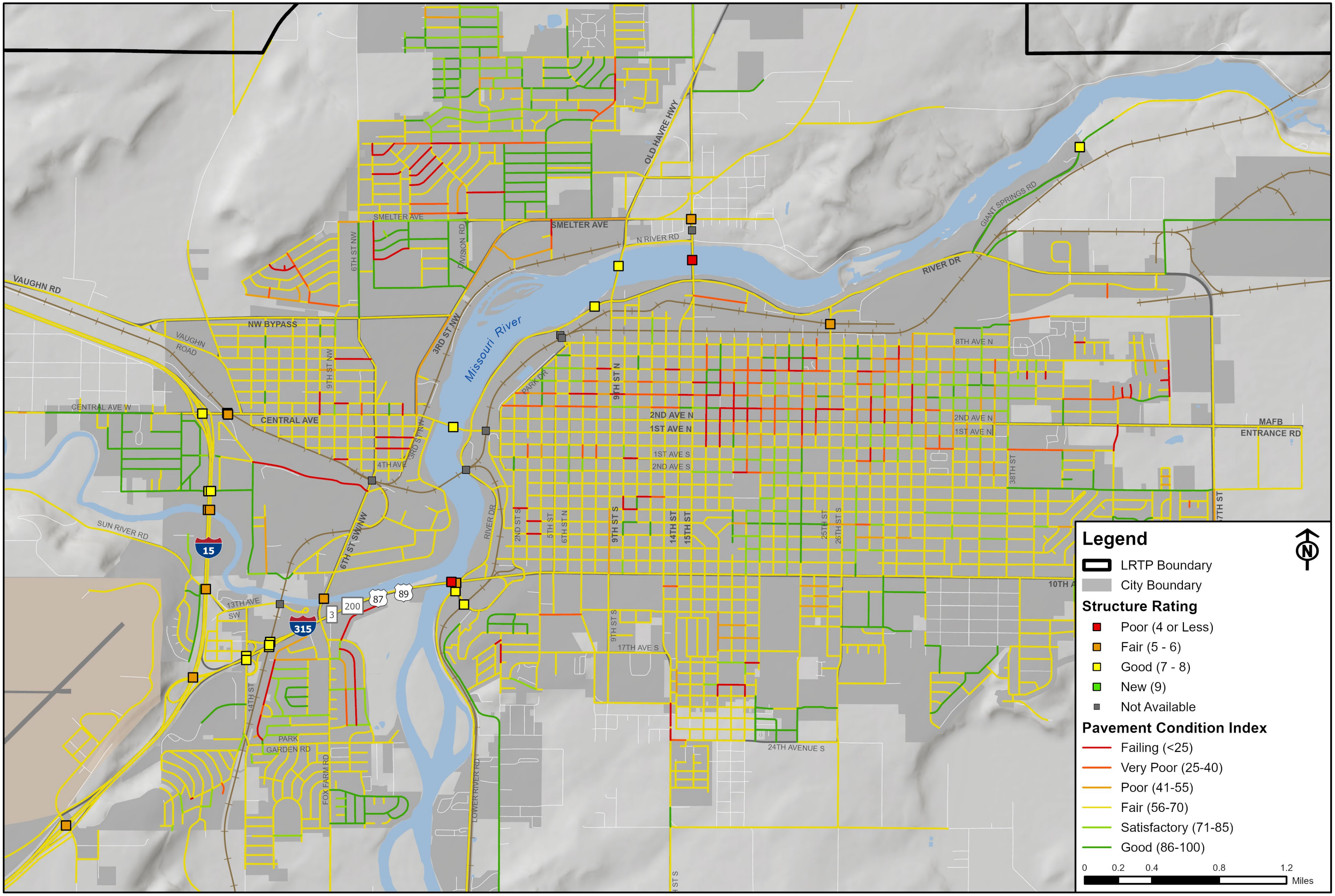


Figure 2.19: Existing Asset Condition

3.0 SAFETY CONDITIONS

Crash data were provided by the MDT Traffic and Safety Bureau for the five-year period between January 1st, 2017, and December 31st, 2021. The crash reports are a summation of information from the scene of the crash provided by the responding officer. As such, some of the information contained in the crash reports may be subjective.

According to the MDT crash database, there were 8,567 crashes reported within the LRTP study area during the five-year analysis period. The number of crashes per year decreased from 1,834 crashes in 2017 to 1,472 crashes in 2020. In 2021, the number of yearly crashes increased to 1,768 crashes. The number of suspected serious injury crashes increased consistently from 9 in 2017 to 16 in 2021. Fatal crashes generally trended upwards from 2017 to 2020 then decreased in 2021. **Figure 3.1** presents the total, injury, and non-injury crashes per year for the five-year analysis period.

The spatial distribution of all crashes was plotted based on the reported crash locations. The density of crashes within the study area is displayed in **Figure 3.2**. The locations of fatal and serious injury crashes are also shown in the figure. The majority of crashes within the LRTP study area occurred within city limits with a larger concentration of crashes in Downtown Great Falls and along 10th Avenue South. Locations with higher traffic volumes appear to have a higher number of crashes.

As shown in **Figures 3.2** and **3.3**, the majority of crashes occurred on the major street network where traffic volumes are higher. A concentration of crashes can be seen along 10th Avenue South and 1st and 2nd Avenues North. Concentrations of injury crashes also occurred on Central Avenue, 3rd Street Northwest, and Smelter Avenue. The intersection of 6th Street Southwest/Fox Farm Road/and Country Club Boulevard also experienced several injury crashes over the five-year analysis period. Most of these concentrations of injury crashes occurred along roadways with higher traffic exposure, however, concentrations of crashes occurring along the 25th and 26th Street corridors may warrant further consideration as these locations have comparatively lower volumes.

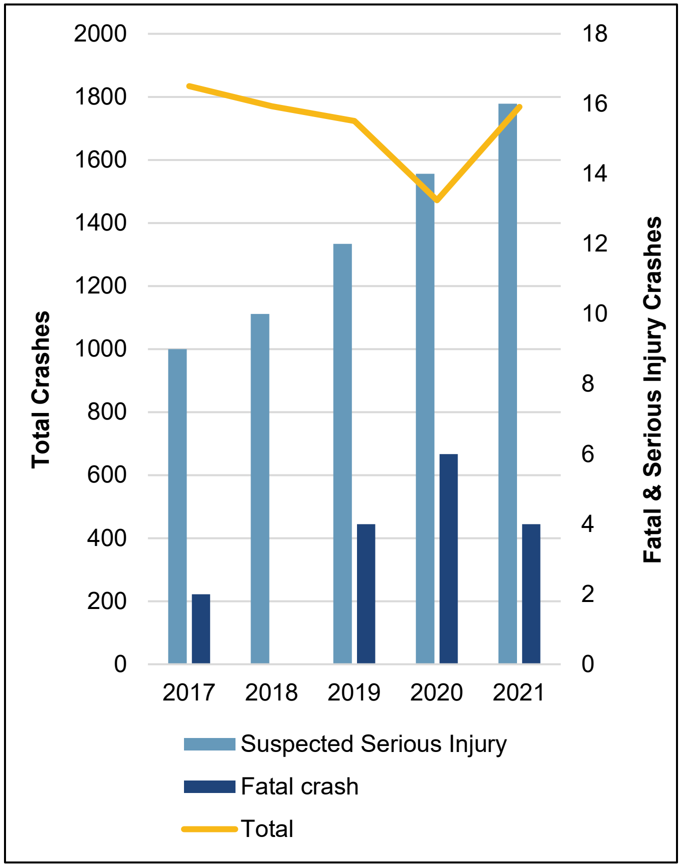


Figure 3.1: Number of Crashes per Year

3.1. SEVERITY

When crashes occur, officers indicate the severity of the resulting injuries for each person involved in the crash. Severity types include property damage only (PDO), possible injury, suspected minor injury, suspected serious injury, and fatality. The overall crash severity is categorized based on the most severe injury resulting from the crash. The locations of the severe (suspected serious and fatal injury) crashes are shown in **Figure 3.2**. A suspected serious injury is defined as an injury, other than a fatality, which prevents the injured individual from walking, driving, or normally continuing the activities they were capable of performing before the injury.

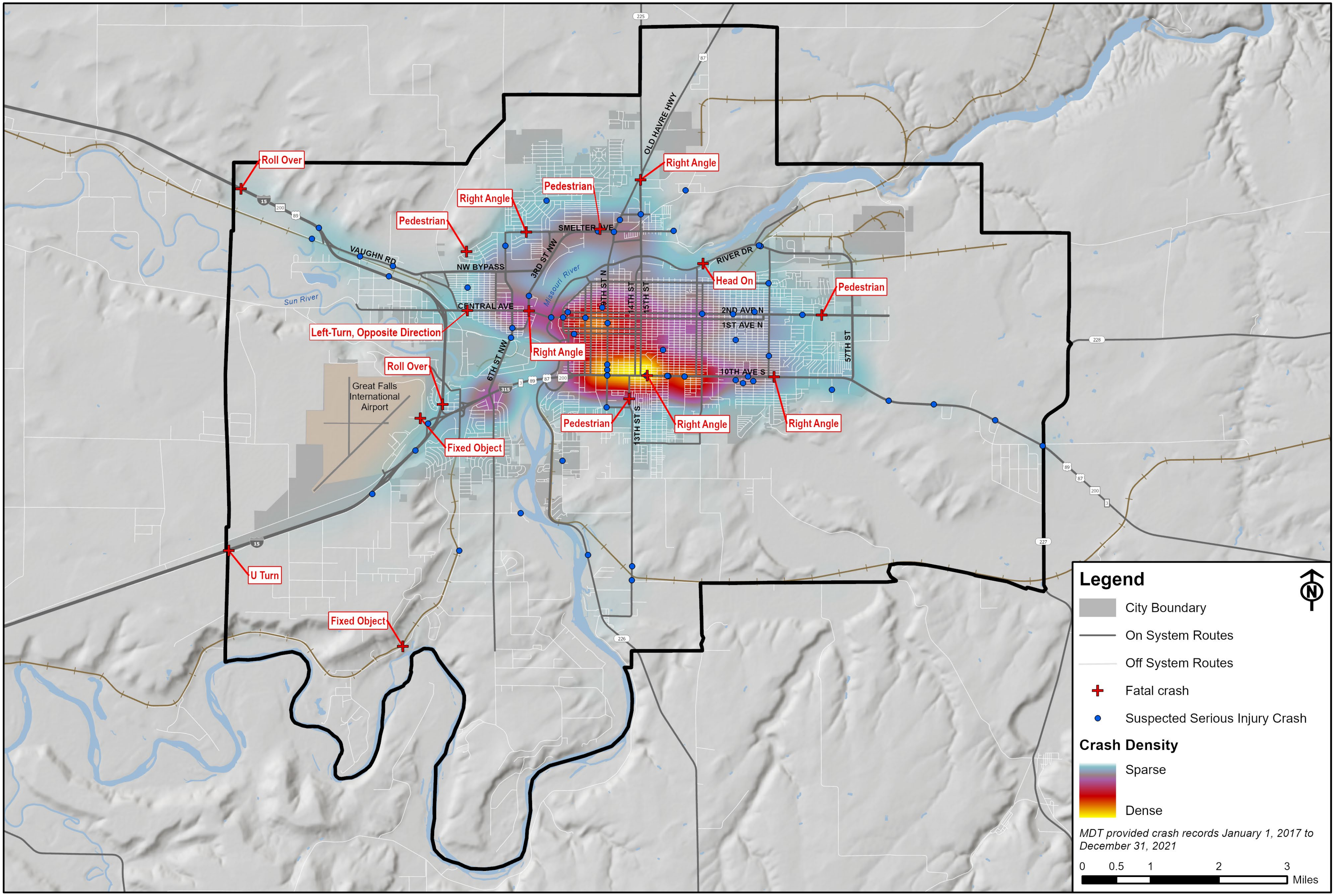


Figure 3.2: Crash Density

The distribution of reported crash severity is presented in **Figure 3.3**. During the five-year analysis period, about 20 percent of the crashes resulted in some level of injury (1,674 crashes), and of which about 4.6 percent were severe (77 crashes). There were 16 fatal crashes and 61 suspected serious injury crashes. During the five-year analysis period a total of 2,312 people were injured in crashes, equating to about 12 percent of all people involved in crashes during the analysis period. A total of 16 fatalities and 80 suspected serious injuries were reported, equating to about 4 percent of all crash-related injuries. Of the severe injuries, about 8.5 percent were vulnerable road users (bicyclists or pedestrians).

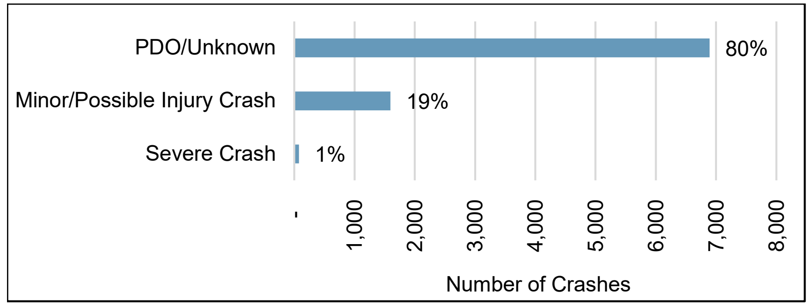


Figure 3.3: Crash Severity

3.2. CRASH PERIOD

Crash data for the study area were evaluated based on the period of time when the crash occurred. With regards to the time of day, three prominent peaks can be seen: one between 7:00 and 8:00 AM (10 percent of crashes), one from 11:00 AM to 1:00 PM (21 percent of crashes), and the other between 3:00 and 6:00 PM (31 percent of crashes). Approximately 82 percent of the reported crashes occurred between the hours of 7:00 AM and 7:00 PM. The distribution of severe crashes generally follows the same pattern as total crashes except with a greater percentage of crashes occurring in the evening and early morning hours. About 31 percent of severe crashes occurred between 8:00 PM and 2:00 AM. The time-of-day distribution is presented in **Figure 3.4**.

Figure 3.5 shows the distribution of reported crashes based on the month of the year in which the crash occurred. The month of February represents the month with the highest reported number of crashes but the month with the lowest number of severe crashes. August had the highest number of severe crashes. Approximately 48 percent of all crashes occurred during winter months (November to March). In Montana, inclement weather conditions often exist during these months which can contribute to an increase in the number of crashes. A larger number of severe crashes occurred during the summer months (June to September) when traffic volumes are higher due to increased travel and tourism.

With respect to the day of the week in which crashes occurred, weekdays had a higher number of crashes than weekends. Friday had the highest number of reported crashes, accounting for about 18 percent of all crashes, while Monday had the highest number of severe crashes (22 percent). Weekend crashes (Saturday and Sunday) accounted for approximately 19 percent of all crashes and 27 percent of severe crashes. The distribution of crashes based on day of the week in which the crash occurred is presented in **Figure 3.5**.

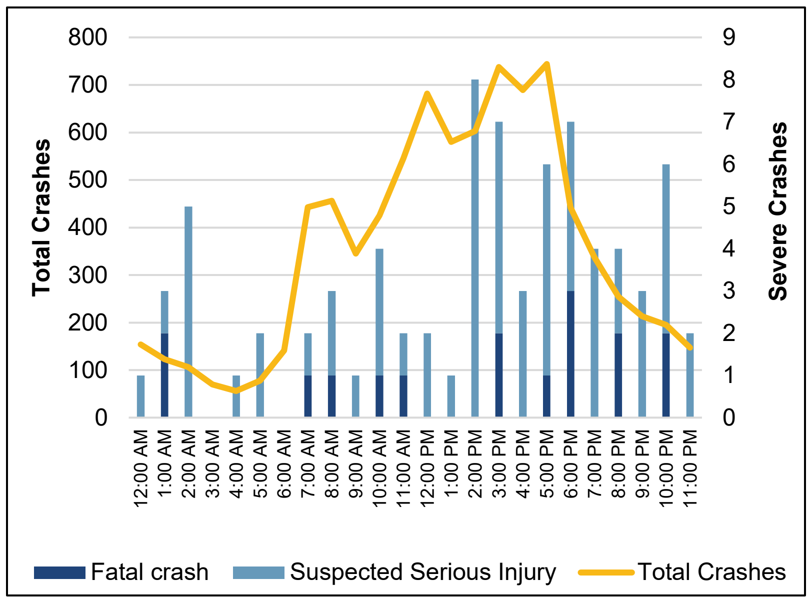


Figure 3.4: Crash Time-of-Day Distribution

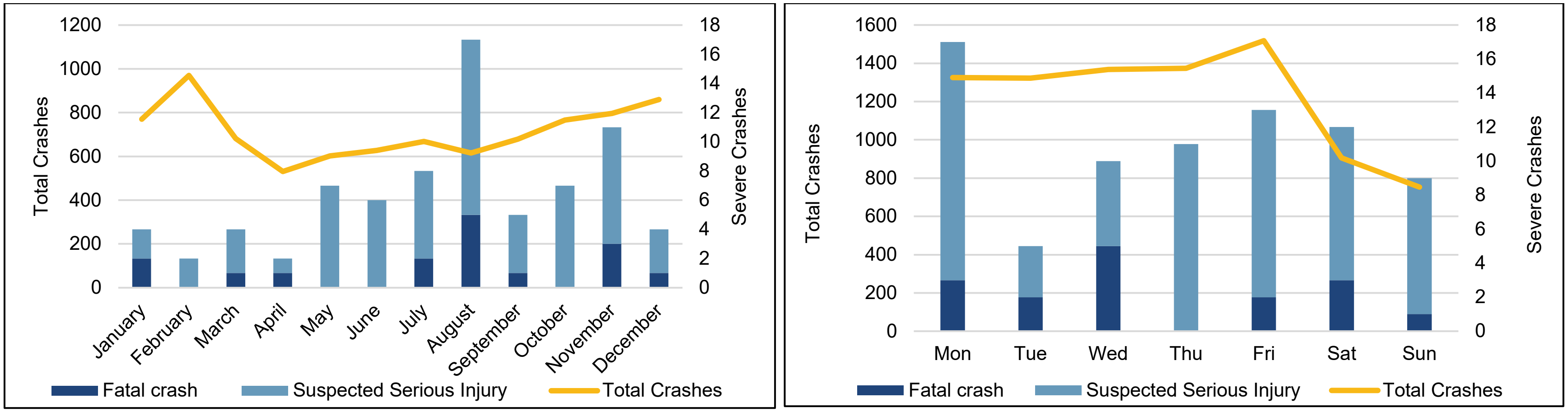


Figure 3.5: Monthly and Weekly Crash Distributions

3.3. Crash Type

Crashes can be categorized as either single vehicle or multi-vehicle crashes. Multi-vehicle crashes accounted for 83 percent of all reported crashes with a total of 7,132 crashes. The most common multi-vehicle crashes were rear-end (33 percent), right angle (30 percent), and sideswipe, same direction crashes (17 percent). Single vehicle crashes represented 17 percent of crashes with 1,435 total crashes. Fixed object crashes were the most commonly reported single-vehicle crash type accounting for 63 percent of those crashes. The most common fixed objects were utility poles/sign supports (33 percent), fences (13 percent), guardrail and other traffic barriers (11 percent), trees (9 percent), and curbs (6 percent). Wild animal and roll over crashes were the next two most common crashes accounting for 12 and 8 percent of single vehicle crashes, respectively. **Figure 3.6** presents the distribution of both multiple and single vehicle crashes within the study area.

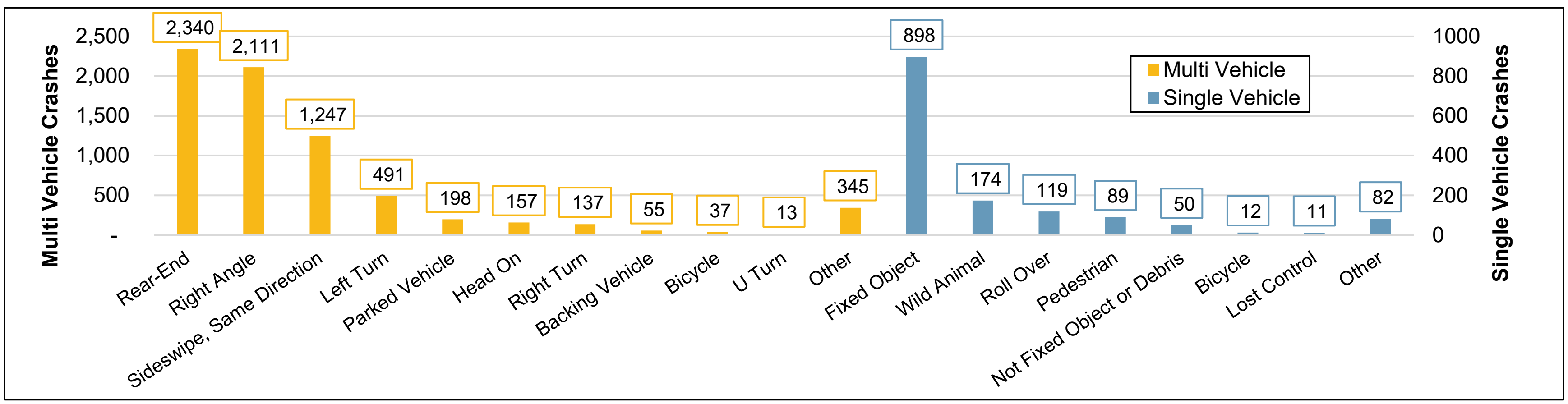


Figure 3.6: Collision Type by Number of Vehicles Involved

3.4. Crash Location

Figure 3.7 shows the distribution of crashes and their respective relationship to junctions. Approximately 45 percent of crashes were reported to have occurred at non-junction locations while about 50 percent were reported to have occurred at an intersection or were intersection-related. Approximately 53 percent of severe crashes occurred at non-junction locations while about 42 percent of severe crashes occurred at intersections or were intersection-related.

The majority of intersection related crashes were right angle (40 percent), rear-end crashes (28 percent), and left or right turns (12 percent). These crash types are common at intersections within urban areas with increased traffic volumes. Of the crashes that occurred at non-junction locations, the most common crash types were rear-end (28 percent), sideswipe, same direction (23 percent), and fixed object (16 percent).

Figure 3.8 shows the distribution of crashes based on the functional class of the roadway on which the crash occurred. The reported functional classification is based on the federally approved designations. The greatest number of crashes most often occurred on non-interstate principal arterials (39 percent) where 32 percent of severe crashes occurred. Local roads had the second highest number of crashes (38 percent) where 29 percent of severe crashes occurred. As seen in **Figure 3.2**, many of the crashes occurred on principal arterials including 10th Avenue South, Central Avenue, 6th Street Northwest, and 3rd Street Northwest where traffic volumes are highest.

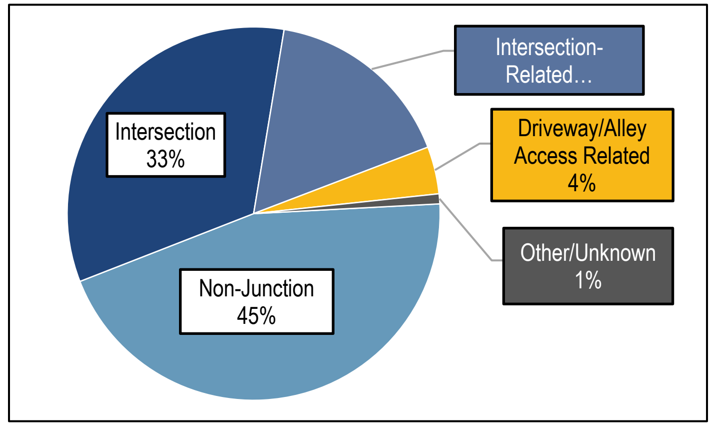


Figure 3.9: Junction Relation

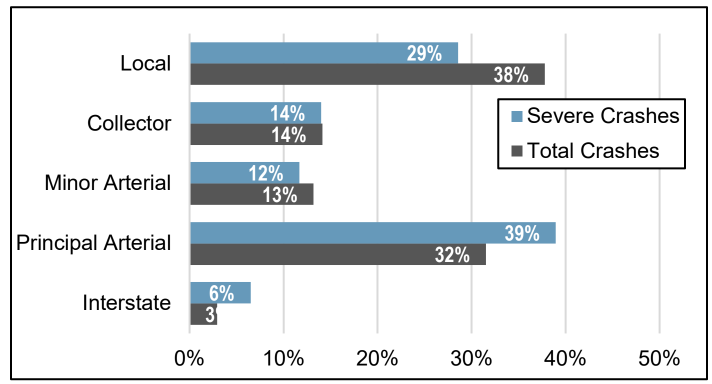


Figure 3.9: Crashes by Roadway Functional Class

3.5. Environmental Factors

Crash data were reviewed to determine if any trends exist in relation to environmental factors such as weather, roadway surface, and lighting conditions. The weather condition was reported as clear or cloudy in 85 percent of all crashes and 86 percent of severe crashes. Adverse weather conditions, including snow and rain, were reported in approximately 13 percent of crashes. **Figure 3.9** presents the distribution of crashes based on weather conditions. The “other” category includes fog, smog, or smoke; severe crosswinds, blowing sand, soil, and dirt; and unknown.

The reported road surface condition for crashes within the study area is presented in **Figure 3.10**. Approximately 65 percent of all crashes were reported as having occurred on dry roads, while 27 percent of crashes were reported as having occurred on snowy, icy, or frost covered roads. Severe crashes occurred primarily on dry roads (82 percent) with about 13 percent occurring on snowy, icy, or frost covered roads.

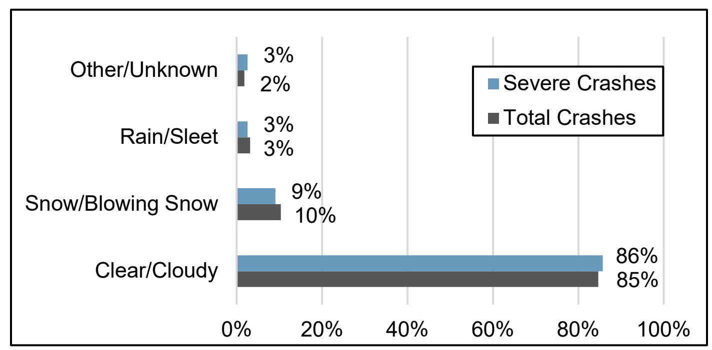


Figure 3.9: Weather Conditions

About 73 percent of all crashes were reported as having occurred under daylight conditions. An additional 17 percent were reported as occurring at dark with street lighting. Severe crashes, however, occurred during daylight hours approximately 57 percent of the time, and at dark without street lighting approximately 23 percent of the time. The distribution of crashes occurring under the different lighting conditions is presented in **Figure 3.10**. The “other” category includes dusk, dawn, and unknown.

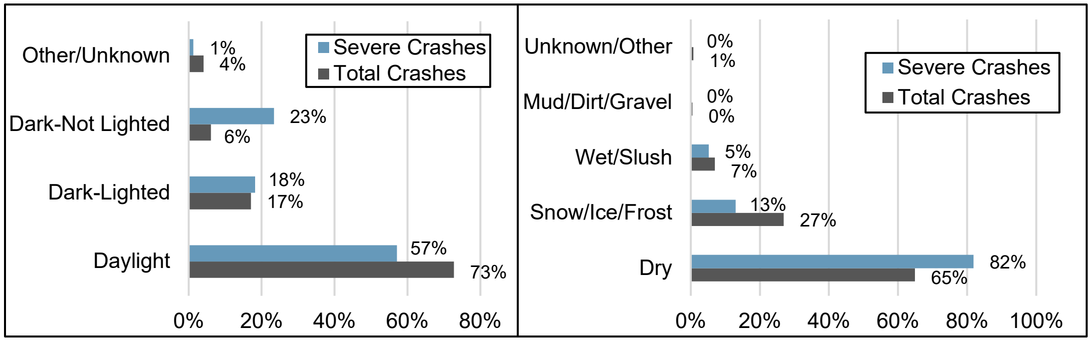


Figure 3.10: Road Surface and Lighting Conditions

3.6. Driver Condition

Driver conditions at the time of the crash can point to driver behavior issues that may need to be addressed. The crash records indicate whether each crash involved fatigued, distracted, and/or impaired drivers. These behaviors are determined and reported based upon the reporting officer’s assessment or driver admission. The crash records indicate that 0.4 percent of drivers were fatigued at the time of the crash and approximately 1 percent of drivers were distracted at the time of the crash.

Impaired driving is defined as operating a vehicle while under the influence of drugs or alcohol. In Montana, driving under the influence is when the driver’s blood alcohol content is 0.08 or higher. Impairment of marijuana in Montana is defined as exceeding a 5ng/ml per se threshold for THC in blood for anyone operating a motor vehicle. Within the study area, approximately 6 percent of crashes (494 crashes) were determined to have involved an impaired driver. Approximately 26 percent of severe crashes (20 crashes) involved an impaired driver. Overall, of the 14,471 drivers involved in all crashes over the five-year period, 692 (5 percent) were suspected and/or determined to be under the influence of drugs or alcohol at the time of the crash.

3.7. Vehicle Type

Over the five-year analysis period, 16,276 vehicles were involved in crashes within the study area. Of these vehicles, 43 percent were passenger cars/vans, 26 percent were pickups, and 23 percent were sport utility vehicles. Large trucks or buses were involved in about two percent of crashes while motorcycles were involved in approximately one percent of crashes. A total of 582 vehicles, approximately 4 percent, were classified as “other (e.g., farm equipment and heavy machinery).” Approximately 16 percent of severe crashes involved motorcycles and about 4 percent of severe crashes involved heavy trucks, buses, or other large equipment and machinery.

3.8. Person Type

A total of 20,044 people were involved in the 8,567 crashes in the Great Falls area over the five-year period. Approximately 72 percent of the people involved in crashes were drivers and 22 percent were passengers. About 55 percent of drivers involved in crashes were male and 45 percent were female. With respect to age, about 12 percent of drivers were over the age of 65 and about 2 percent of drivers were under the age of 15. In Montana, minors that are at least 15 years old may apply for a learner’s permit. Applicants who are 14 ½ years old and have completed driver’s education may also be eligible to apply for their learner’s permit.

3.9. Vulnerable Road Users

Of the 8,567 crashes that occurred during the five-year analysis period, just under two percent involved vulnerable road users. There were a total of 49 bicycle- and 94 pedestrian-related crashes that occurred within the analysis period. None of the bicycle-related crashes resulted in severe injuries and 11 pedestrian-related crashes resulted in severe injuries. Of all the people involved in crashes, about 1 percent were vulnerable road users.

3.10. High Injury Network

A high injury network (HIN) is a screening methodology that identifies areas within the transportation system with the greatest safety concerns. Jurisdictions across the country use various methodologies to develop local HINs depending on the availability of data in their jurisdiction. A HIN was created for the Great Falls area by calculating a safety score weighing the frequency of crashes, rate of crashes in comparison to traffic volumes, and severity of injuries resulting from crashes as shown in **Figure 3.11**. This method helps identify and prioritize locations with unusually high crash occurrences or especially severe crashes.

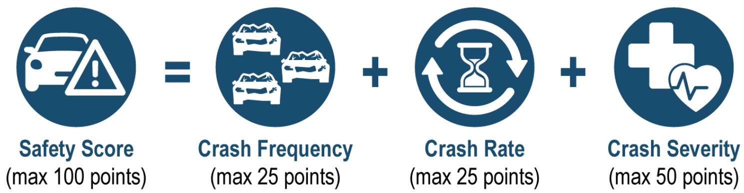


Figure 3.11: Safety Score Calculation

To calculate the severity of crashes occurring within a given area, a severity index was calculated by assigning weighting factors to the number of injuries resulting from crashes within the analysis area. The weighting factors used for this calculation were derived by MDT's Traffic and Safety Engineering Bureau in 2023 from typical crash costs in Montana. The crash rate was calculated using volumes from the base-year travel demand model (discussed in **Section 4.1**) and is expressed in terms of million entering vehicles. The location with the highest crash frequency, crash rate, or severity index, respectively, were assigned the maximum score in each category then all other locations were assigned a proportion of the score based on a logarithmic relationship. This methodology is intended to provide a fair comparison between locations with differing traffic volumes or roadway characteristics by filtering out outliers that would be identified if considering one measure alone (i.e., crash rates are high when volumes are low; crash frequencies are higher on higher volume roads; and a crash involving a vehicle with several occupants may skew priorities). The HIN was evaluated on both an intersection and roadway segment-basis as described in the following sections.

3.10.1. Intersections

The intersection HIN analysis calculated the safety score at each intersection by selecting crashes within 150 feet of each intersection. **Figure 3.12** illustrates the intersections with the highest safety scores and **Table 3.1** tabulates the characteristics of the intersections with the highest scores. The top five highest scoring intersections in each of the three score components are highlighted in red. Notably, three of the top five intersections with the highest crash rates occurred on 4th Avenue South, although most intersections with high crash rates were not in the top 2.5 percent of overall safety scores. All of the intersections with the highest crash frequency scores occurred on 10th Avenue South, and many of those intersections also had the highest severity and overall safety scores. Of the 31 highest scoring intersections, 18 are signalized, 7 are two-way stop-controlled (TWS), 4 are uncontrolled, 1 is all-way stop-controlled (AWS), and 1 is yield controlled. Thirteen of the intersections are on 10th Avenue South and four are on Central Avenue. All of the highest scoring intersections are within Great Falls city limits. Two intersections have recently been reconstructed to address historic safety concerns.

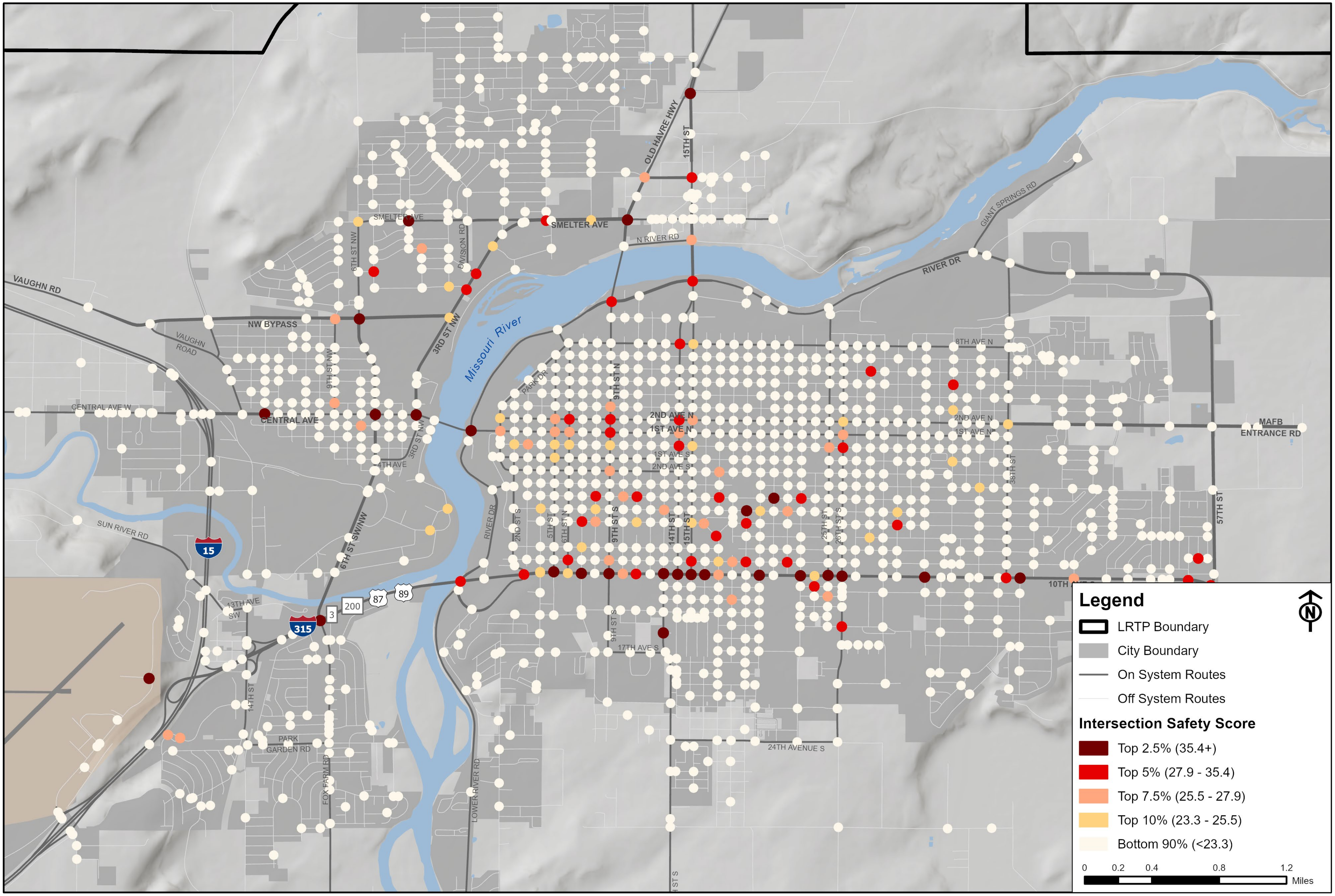


Figure 3.12: Intersection HIN

Table 3.1: Top Intersection Safety Scores

Rank	Intersection	Control Type	Volume (vpd)*	# of Crashes	# of Severe Injuries	Rate Score	Frequency Score	Severity Score	Safety Score
Top 2.5%									
1	10th Ave S / 9th St S	Signal	45,950	152	2	6.2	25.0	47.6	78.8
2	Central Ave / 3rd St NW	Signal	43,750	67	1	3.4	21.0	50.0	74.4
3	10th Ave S / Fox Farm Rd / 6th St NW	Signal	37,550	141	0	6.8	24.6	35.2	66.6
4	10th Ave S / 16th St S	TWS	36,250	31	2	2.0	17.2	44.9	64.2
5	10th Ave S / 39th St S	Signal	24,050	26	2	2.5	16.4	44.3	63.2
6	Old Havre Hwy / 15th St	TWS	15,700	17	1	2.5	14.4	43.1	60.0
7	10th Ave S / 25th St S	Signal	39,650	85	0	4.5	22.1	32.8	59.4
8	10th Ave S / 15th St S	Signal	39,550	108	0	5.4	23.3	30.2	58.9
9	10th Ave S / 20th St S	Signal	40,300	81	2	4.2	21.9	29.6	55.7
10	Smelter Ave / 2nd St NW / Riverview Blvd	TWS	6,300	9	2	3.2	11.4	37.9	52.5
11	10th Ave S / 23rd St S	Signal	38,850	81	1	4.4	21.9	26.2	52.5
12	10th Ave S / 13th St S	Signal	38,650	83	0	4.5	22.0	22.7	49.1
13	10th Ave S / 14th St S	Signal	38,700	82	0	4.4	21.9	21.7	48.1
14	Airport Dr / Airport Ct**	Uncontrolled	1,000	3	1	5.8	6.9	35.2	47.9
15	Central Ave / 1st Ave N / River Dr	Signal	28,850	71	1	5.0	21.3	18.8	45.0
16	Central Ave / 14th St NW	TWS	11,500	4	1	0.9	8.0	34.8	43.6
17	10th Ave S / 26th St S	Signal	43,550	80	0	3.9	21.8	17.6	43.4
18	6th St NW / NW Bypass	Signal	29,450	52	0	3.8	19.7	17.4	41.0
19	13th St S / 14th Ave S	TWS	7,350	2	1	0.7	5.5	33.8	39.9
20	10th Ave S / 7th St S	Signal	35,350	59	0	3.6	20.3	15.0	39.0
21	Central Ave / 6th St NW	Signal	36,050	51	0	3.2	19.6	15.8	38.6
22	Smelter Ave / Old Havre Hwy	Signal	35,000	50	3	3.2	19.5	15.9	38.6
23	10th Ave S / 5th St S	Signal	34,950	54	0	3.4	19.9	14.5	37.8
24	10th Ave S / 32nd St S	Signal	32,850	61	0	4.0	20.5	13.2	37.7
25	5th Ave S / 19th St S	TWS	500	13	1	20.2	13.1	4.1	37.5
26	4th Ave S / 21st St S	TWS	200	9	0	25.0	11.4	1.0	37.4
High Rate/Frequency/Severity Scores (not Top 2.5%)									
29	4th Ave S / 17th St S	Yield	300	9	0	21.4	11.4	1.6	34.5
33	6th Ave S / 30th St S	Uncontrolled	200	6	0	21.4	9.7	1.6	32.7
35	4th Ave S / 11th St S	Uncontrolled	300	8	0	20.4	10.9	0.7	32.1
50	8th Ave S / 55th St S	Uncontrolled	50	2	0	23.9	5.5	0.2	29.7
55	6th Ave S / Chowen Springs Loop**	AWS	150	4	0	20.4	7.9	0.4	28.9

*Volumes shown are derived from the base condition (2019) travel demand model. The model is calibrated to volumes on the major street network, and therefore volumes listed for streets on the local road network may not accurately reflect actual conditions.
**Improvements have recently been made to the intersection to address historic safety concerns.

3.10.2. Roadway Segments

The roadway segment HIN analysis evaluated the roadway network using a "sliding window" method, as recommended by the *Highway Safety Manual*, to effectively compare roadway segments of equal length. The sliding window method calculates crash scores by evaluating crashes and injuries occurring in 0.5-mile segments (i.e., "windows"), and then sliding the window along the roadway 0.1-miles at a time, as demonstrated in **Figure 3.13**. Crashes occurring within 150 feet of an intersection were excluded from the roadway segment analysis to place focus on non-junction crashes. This method helps identify locations with the highest concentrations of crashes and/or severe injuries and reduces the possibility of splitting locations with high concentrations of crashes into separate segments, which would reduce the safety score for segments that start and end in high-crash spots.

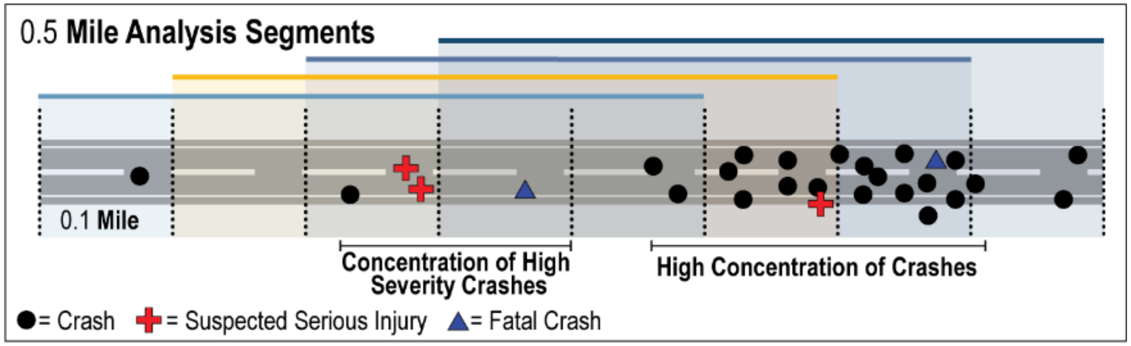


Figure 3.13: Sliding Window Method

Figure 3.14 depicts roadway segments with the highest safety scores and **Table 3.2** tabulates the characteristics of the segments with the highest scores. Where several consecutive segments were identified as having high scores, an average of the corresponding volume, rate, frequency, severity, and overall safety scores is listed. The top five highest scoring segments in each of the three score components are highlighted in red. When intersection crashes are excluded, the frequency of crashes and severe injuries on each segment is much lower, with no more than one fatal or serious injury crash having occurred on any of the top scoring segments. Accordingly, the segments where a severe injury crash occurred are likely to score high due to the higher weighting of severity in the safety score. For this reason, it is important to take into consideration the safety scores in comparison to the number of total crashes and severe injuries to better understand potential crash trends and safety concerns. Furthermore, each segment should be examined in detail to understand the circumstances around the crashes that occurred to understand whether crashes occurred due to problematic infrastructure conditions, repeated improper driver behaviors, or chance occurrences that could not have been otherwise prevented.

As shown in **Table 3.2**, three of the highest scoring segments were on I-15, primarily due to a fatal crash occurring on each. The segments with the highest crash rates are primarily on the local roadway network. Due to the focus on the major street network in the travel demand model, the local roadways may actually carry more traffic than indicated by the model, which could unintentionally skew the crash rate scores. Three of the top five highest frequency segments are streets with over 20,000 vpd; which consequently resulted in lower crash rate scores. However, River Drive and 9th Street South are also in the top five scoring segments for crash frequency and have about half as many vpd as the other top scoring segments and comparatively low crash rate scores. Overall, the roadway segment safety score analysis revealed a mix of urban and rural locations with 6 of the 18 top scoring segments being outside city limits.

Table 3.2: Top Roadway Segment Safety Scores

Rank	Roadway	Extent	Volume (vpd)*	Length (mi)	# of Crashes	# of Severe Injuries	Avg. Rate Score	Avg. Frequency Score	Avg. Severity Score	Avg. Safety Score
Top 2.5%										
1	**I-15**	West of Vaughn Road	10,400	0.6	18	1	12.2	14.8	43.4	70.4
2	**River Drive**	19th St N to Black Eagle Viewpoint	11,700	0.8	27	1	4.4	18.7	48.6	71.6
3	**8th Street NE**	Smelter Ave to 29th Ave NE	7,200	0.5	7	1	2.9	12.9	44.3	60.1
4	**Flood Road**	Red Barn Rd to River Bend Dr	800	0.9	4	1	6.1	7.1	40.9	54.1
5	**I-15**	Southwest of Gore Hill	7,400	0.5	2	1	11.0	6.8	41.2	59.0
6	**I-15 / I-315**	Interchange	11,000	0.9	12	1	2.4	11.0	41.6	55.0
7	**Valley View Drive**	15th St NW to Smelter Ave	600	0.5	2	1	7.4	6.8	41.0	55.2
8	**2nd Ave North**	42nd St N to 57th St	6,500	0.9	6	1	2.4	10.9	41.5	54.8
9	**10th Avenue South**	Fox Farm Rd to Overlook Dr	22,300	1.1	66	0	5.2	24.1	12.5	41.9
10	**Central Avenue**	4th St NW to 4th St N	23,500	0.8	49	0	4.2	22.5	14.3	41.0
11	**Fields Road**	Goon Hill Rd	100	0.5	6	0	25.0	12.1	2.7	39.8
12	**9th Street South**	5th Ave S to 13th Ave S	10,800	0.6	34	0	6.7	22.0	9.9	38.6
13	**7th Street South**	10th Ave S to 2nd Ave S	800	0.6	13	0	15.7	16.4	5.2	37.2
High Rate/Frequency/Severity Scores (not Top 2.5%)										
14	**3rd St NW/Smelter Ave**	Private Driveway to Old Havre Hwy	20,500	1.6	65	1	3.5	20.4	9.0	32.9
18	**Sun River Rd**	Sun View Lane to Private Driveway	150	0.9	6	0	20.5	11.6	0.6	32.6
21	**18th Avenue North**	River Dr N to 52nd St N	50	1.1	4	0	21.7	7.3	0.3	29.2
26	**Elk Drive**	Dick Rd to Terminus	50	0.5	2	0	21.0	6.8	1.0	28.8
27	**12th Street Northeast**	34th Ave NE to Skyline Dr NE	50	0.1	2	0	21.0	6.8	0.2	28.0

*Volumes shown are derived from the base condition (2019) travel demand model. The model is calibrated to volumes on the major street network, and therefore volumes listed for streets on the local road network may not accurately reflect actual conditions.

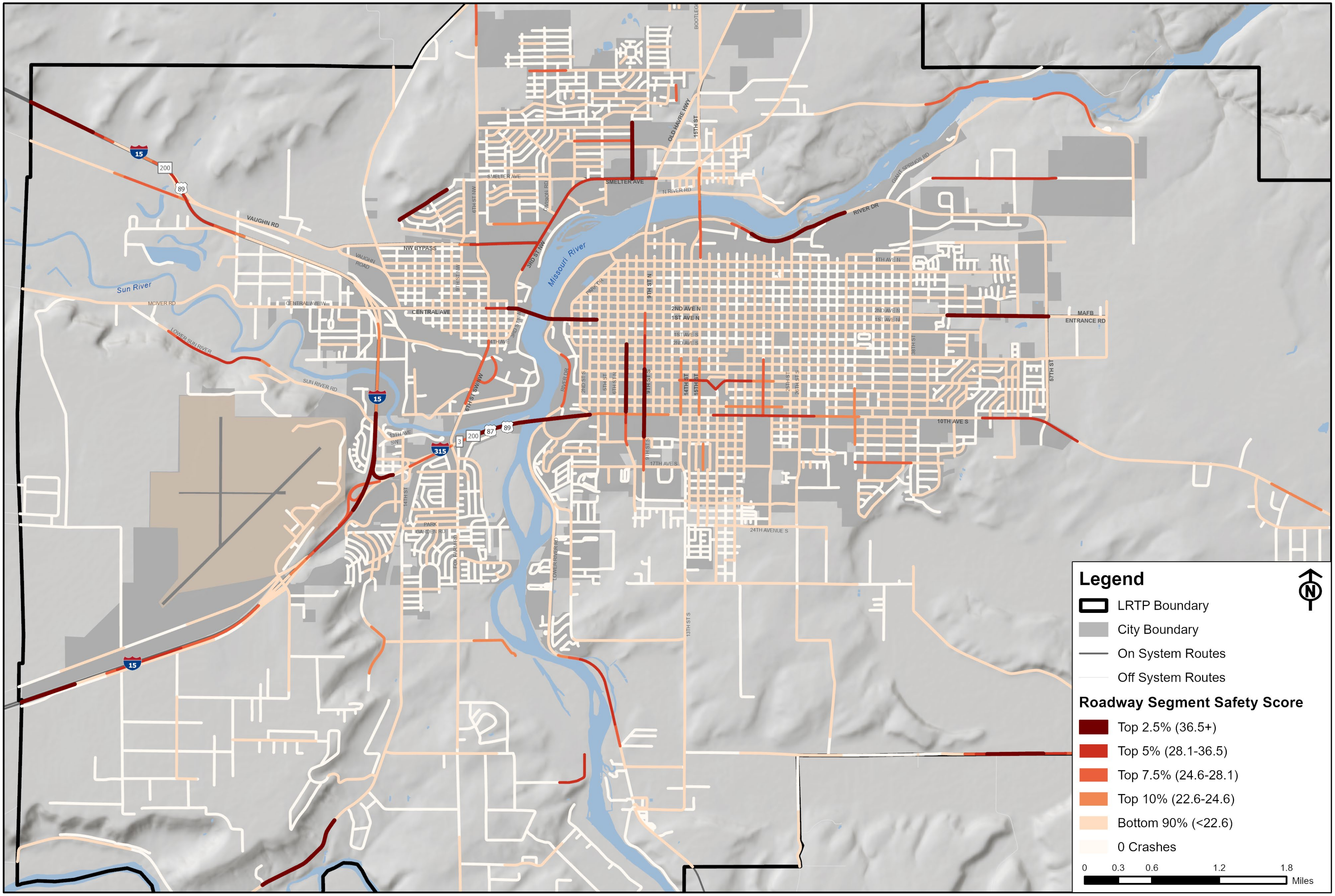


Figure 3.14: Roadway Segment HIN

3.11. Crash Summary

The following summarizes key characteristics of crashes occurring within the Great Falls area during the five-year analysis period.

- Severe crashes increased over the 2017 to 2021 period while the overall number of crashes experienced a mild decline.
- Most crashes occurred along roadways with higher traffic exposure.
- Crash occurrences increased during peak travel hours including commute times, school pick-up/drop off times, and lunch time.
- Weekend crashes (Saturday and Sunday) accounted for approximately 19 percent of all crashes and 27 percent of severe crashes.
- Multi-vehicle crashes accounted for 83 percent of all reported crashes with the most common crash types being rear-end, right angle, and sideswipe, same direction crashes.
- Adverse weather conditions, including snow and rain, were reported in approximately 13 percent of crashes.
- About 23 percent of severe crashes occurred at dark without street lighting.
- Approximately 6 percent of all crashes and 26 percent of severe crashes involved an impaired driver.
- Approximately 16 percent of severe crashes involved a motorcycle.
- There were 49 bicycle and 94 pedestrian-related crashes that occurred within the analysis period. About 8.5 percent of the severe injuries were non-motorists.
- About 12 percent of drivers were over the age of 65.
- All the intersections with the highest crash frequency scores occurred on 10th Avenue South, and many of those intersections also had the highest severity and overall safety scores. Of the 31 highest scoring intersections, 18 are signalized, 7 are two-way stop-controlled, 4 are uncontrolled, 1 is all-way stop-controlled, and 1 is yield controlled. All but 8 of the highest scoring intersections are on the major street network.
- The roadway segment safety score analysis revealed a mix of urban and rural locations with 6 of the 18 top scoring segments being outside city limits.

4.0 PROJECTED TRANSPORTATION CONDITIONS

An analysis of the projected transportation system was performed to estimate how existing traffic patterns and characteristics may change over the next 20 plus years. The inputs for this analysis include known existing conditions and anticipated land development expected to occur out to the year 2045. A description of the traffic modeling effort that was conducted to forecast future travel conditions is described in this section. The results of the model were used to identify areas of the transportation system where traffic growth and congestion may occur due to forecasted development.

4.1. Travel Demand Model Development

A travel demand model was developed by the MDT Multimodal Planning Bureau for Cascade County using *TransCAD* software. The model used industry-accepted methodologies and data from the MDT Geospatial Information Section, Census Bureau, and Montana Department of Labor and Industry to represent 2019 baseline traffic conditions. A comparison of the model to known 2019 traffic data was performed to calibrate and validate the model to best represent 2019 conditions.

After developing the baseline 2019 model, future conditions were developed to evaluate the planning year 2045. As detailed in the *Socioeconomics and Land Use Memorandum,* housing units and jobs were allocated to census blocks to distribute growth that has occurred since 2019 or is projected to occur by the year 2045. Known roadway infrastructure projects which will change the capacity or function of the roadway and are expected to be constructed within the next five years ("committed" projects) were also included in the 2045 future model.

The model assumes that traffic characteristics will remain similar to those that are seen today. Many factors can influence this assumption, including fluctuations in fuel prices, shifts in mode choice, technological advances, and other unknown circumstances. The model also assumes that the socioeconomic projections will be realized by the year 2045. Although projections are based upon local knowledge and past growth trends, development can change over time and projections may not accurately represent reality. Ultimately, the projected conditions model is a valuable planning tool that can help predict how traffic patterns might be affected by anticipated future development.

4.2. Projected Roadway Volumes and Capacity

Projected traffic volumes were estimated using the travel demand model. A comparison of the existing and projected conditions models was performed to determine the percent change in traffic volume. The percentage changes were then applied to known existing AADT count sites to estimate future AADTs. **Figures 4.1** and **4.2** show the projected AADT volumes and v/c ratios along the major street network, respectively. Note that the values shown in the figures assume that no changes to the transportation system will be made other than those which already have committed funding.

A map of the projected traffic volume growth on the major street network was prepared to help visualize where growth is expected to occur given future land use assumptions. **Figure 4.3** shows the difference between the traffic volumes in the 2019 and 2045 travel demand models. This visualization helps identify which roads may need additional investment to accommodate future growth. While some roads currently have little traffic volume and may not have capacity issues, future growth could shift or greatly increase traffic volumes, causing capacity issues if improvements are not made.

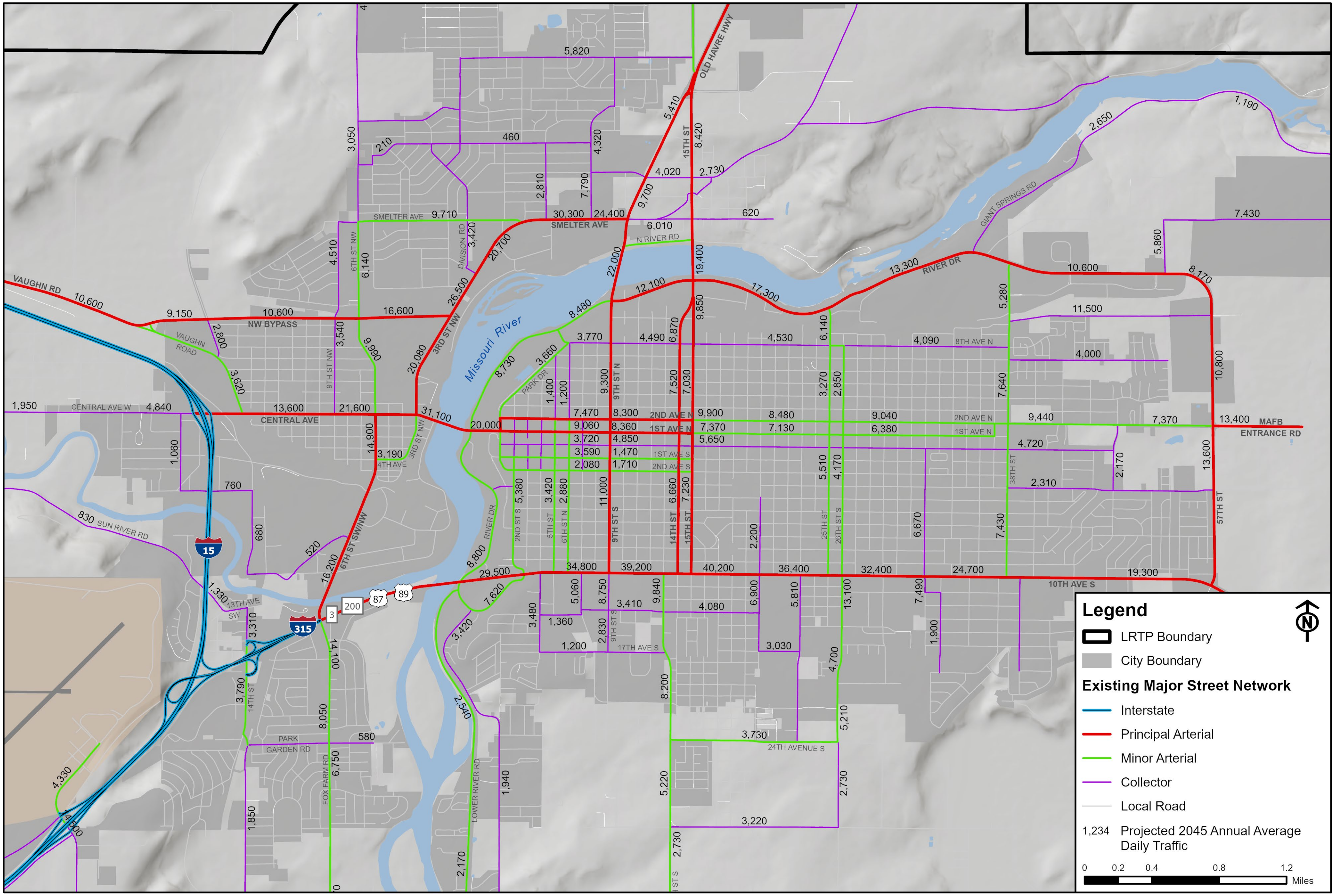


Figure 4.1: Projected Traffic Volumes (2045)

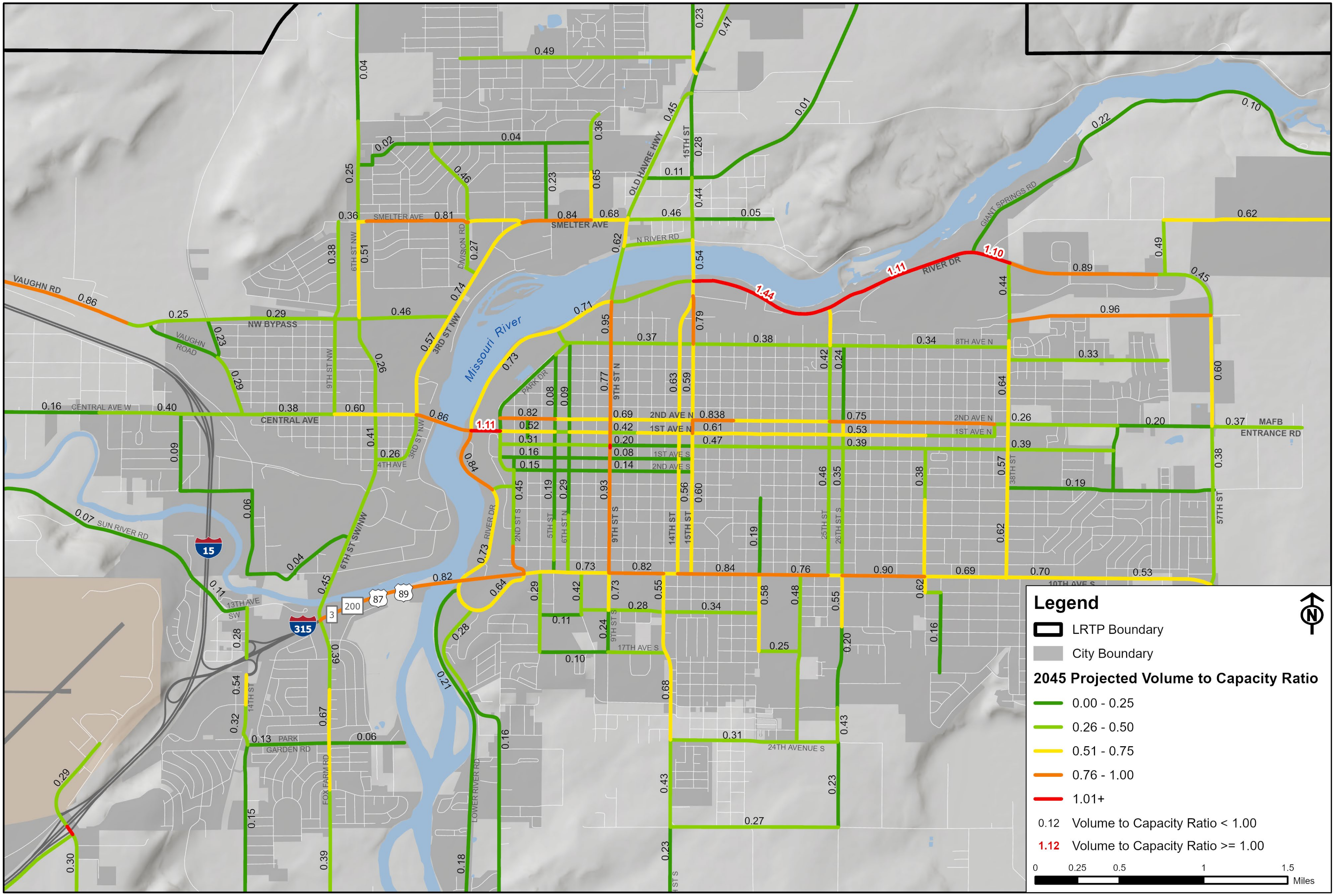


Figure 4.2: Projected Volume to Capacity Ratios (2045)

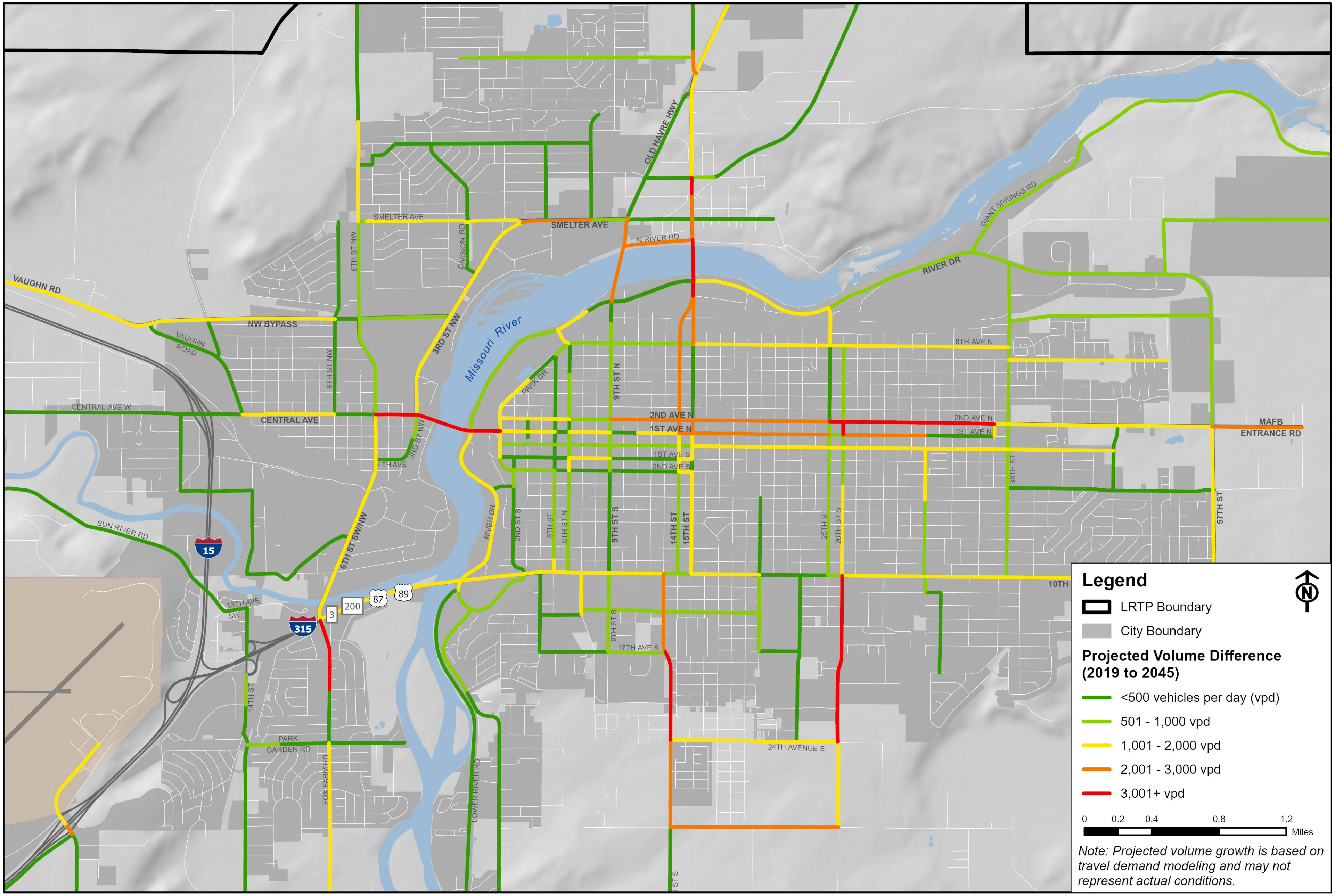


Figure 4.3: Projected Volume Difference (2019 to 2045)

4.3. Projected Intersection Level of Service

Projections for intersection traffic volumes were made for the 63 intersections analyzed previously in **Section 2.2.2**. These projections were based on percent growth rates calculated from the travel demand model for the year 2045. An average growth rate for the intersection was determined and applied to individual turning movements to represent projected conditions. The intersection LOS was calculated using the existing street layouts, lane-use configurations, and traffic control devices. The results of the analysis are shown in **Table 4.1** and **Figure 4.4**. More detailed information is provided in **Appendix C**.

The operational analysis indicates that with continued growth, intersection operations on major arterials will experience deteriorated conditions and high amounts of delay, especially during the PM peak hour. Several intersections are shown to operate at LOS E or F during one or more peak hours. The majority of the intersections that are projected to experience failing conditions are unsignalized. However, there are also several signalized intersections which are projected to reach or exceed their available capacity if traffic growth occurs in the manner predicted. Intersections along 10th Avenue South, 3rd Street Northwest, River Drive, 6th Street Southwest, 15th Street and 38th Street experience the highest amounts of delay.

4.4. Projected Conditions Summary

The projected conditions analysis is based on a travel demand model developed for Cascade County to represent predicted 2045 conditions. The model relies on forecasted population and employment growth and anticipated development patterns. The analysis assumes that all roadway and intersection configurations, aside from projects that are already committed, will remain the same over the next 20 years. Therefore, changes in travel patterns resulting from new road connections, revised intersection configurations, and development could impact the projected traffic volumes and intersection operations initially predicted by the model. The projected v/c ratios and intersection operations presented in previous sections are intended to provide an estimate for planning purposes. Traffic conditions should be continually evaluated as development occurs and as improvements are needed.

Based on the anticipated traffic growth presented in **Figures 4.1**, **4.2**, and **4.3**, River Drive, Central Avenue, 10th Avenue South, and Smelter Avenue are likely to approach or exceed available roadway capacity by 2045 if traffic continues to grow as anticipated. As a result, traffic is anticipated to shift to other arterials in the roadway network, such as the 1st Avenue North / 2nd Avenue North and 14th Street / 15th Street couplets and Park Drive, to avoid congestion on parallel routes. Considerable growth is also anticipated to occur in the southern part of the city near the universities and hospitals, in the Fox Farm area, and in the North Great Falls area contributing to increasing traffic volumes on adjacent roadways such as Bootlegger Trail, 6th Street Northwest, Fox Farm Road, 13th Street South, 26th Street South, 24th Avenue South, and 33rd Avenue South. However, projected traffic volumes on these roadways are not expected to exceed the available capacity of the existing roadways within the planning horizon.

As shown in **Table 4.1** and **Figure 4.4**, the same arterials are also expected to experience worsening intersection operations during peak hours. Projected shifts in traffic to parallel, less congested routes help alleviate some demand at major intersections without causing operational failures at intersections along those routes.

Table 4.1: Projected Intersection Level of Service

ID	Intersection	Control*	AM Peak		PM Peak	
			Delay (sec)	LOS	Delay (sec)	LOS
01	Park Garden Rd/Fox Farm Rd	TWS	25.3	D	29.2	D
02	6th St SW/Fox Farm Rd/Country Club Blvd	Signal	77.6	E	63.0	E
03	6th St SW/4th Ave SW	TWS	42.8	E	61.8	F
04	9th St NW/Central Ave W	Signal	6.8	A	6.6	A
05	6th St SW/Central Ave W	Signal	26.9	C	31.9	C
06	3rd St NW/Central Ave W	Signal	44.1	D	73.5	E
07	6th St NW/Northwest Bypass	Signal	18.6	B	17.0	B
08	3rd St NW/Northwest Bypass	Signal	21.3	C	20.9	C
09	3rd St NW/14th Ave NW	Signal	13.3	B	13.8	B
10	3rd St NW/17th Ave NE	TWS	68.4	F	132.1	F
11	3rd St NW/4th St NE	TWS	15.1	C	15.7	C
12	3rd St NW/Smelter Ave NE	Signal	14.6	B	10.7	B
13	Smelter Ave NE/6th St NE (1)	Signal	15.8	B	11.6	B
14	Smelter Ave NE/6th St NE (2)	Signal	4.4	A	9.4	A
15	Old Havre Hwy/25th Ave NE	TWS	18.0	C	32.4	D
16	Bootlegger Trail/US 87	TWS	34.2	D	266.5	F
17	15th St NE/25th Ave NE	TWS	145.4	F	1257.2	F
18	River Dr N/25th St N	TWS	36.5	E	133.1	F
19	8th Ave N/38th St N/Highwood Dr	TWS	17.3	C	41.6	E
20	Central Ave/38th St N	AWS	21.6	C	25.5	D
21	3rd Ave S/38th St S	TWS	43.7	E	24.9	C
22	3rd Ave S/57th St S	TWS	20.1	C	32.9	D
23	Central Ave/River Dr S/1st Ave N	Signal	28.5	C	66.5	E
24	1st Ave N/Park Dr	Signal	17.5	B	35.1	D
25	1st Ave S/Park Dr	TWS	10.0	A	10.6	B
26	9th St N/2nd Ave N	Signal	22.0	C	20.1	C
27	9th St N/1st Ave N	Signal	24.4	C	35.9	D
28	9th St N/Central Ave	Signal	16.1	B	41.1	D
29	9th St N/1st Ave S	Signal	8.7	A	9.0	A
30	9th St N/2nd Ave S	Signal	5.6	A	8.6	A
31	10th Ave S/5th St S	Signal	12.9	B	18.6	B
32	10th Ave S/9th St S	Signal	20.9	C	30.4	C
33	10th Ave S/20th St S	Signal	8.9	A	12.6	B
34	10th Ave S/23rd St S	Signal	6.7	A	34.5	C
35	10th Ave S/26th St S	Signal	15.2	B	25.1	C
36	10th Ave S/29th St S	TWS	37.4	E	113.4	F
37	10th Ave S/32nd St S	Signal	22.8	C	32.8	C
38	15th Ave S/26th St S	TWS	104.9	F	52.4	F
39	13th St S/24th Ave S	TWS	11.2	B	12.2	B
40	US 89/Highwood Rd/Stockett Rd	TWS	16.6	C	13.4	C
41	14th St SW/Market Place Dr	Signal	7.3	A	11.4	B
42	14th St SW/EB Ramps	Signal	9.5	A	10.4	B
43	14th St SW/WB Ramps/16th Ave SW	Signal	12.0	B	12.9	B
44	14th St SW/13th Ave SW	TWS	10.2	B	10.5	B
45	3rd St NW/16th Ave NW	TWS	16.9	C	22.7	C
46	8th St NE/Sacajawea Dr	TWS	11.9	B	12.0	B
47	6th St NW/Skyline Dr NW	TWS	9.9	A	10.5	B
48	Division Rd/Skyline Dr NW	TWS	9.4	A	10.9	B
49	2nd St NE/Skyline Dr NE	TWS	13.2	B	14.5	B
50	5th St NE/Skyline Dr NE	TWS	9.3	A	9.5	A
51	9th St NE/Skyline Dr NE	TWS	9.1	A	8.9	A
52	9th St NE/32nd Ave NE	TWS	10.4	B	8.8	A
53	2nd St NE/36th Ave NE	TWS	13.4	B	13.9	B
54	5th St NE/36th Ave NE	TWS	9.5	A	9.5	A
55	9th St NE/36th Ave NE	TWS	17.9	C	17.1	C
56	Bootlegger Tr/36th Ave NE	TWS	17.4	C	16.8	C
57	Bootlegger Tr/46th AVE NE	TWS	9.9	A	8.8	A
58	Vinyard Rd/6th St NW	TWS	8.6	A	8.5	A
59	River Dr S/3rd Ave S	TWS	9.2	A	10.8	B
60	River Dr N/15th St NE	Signal	55.4	E	71.9	E
61	1st Ave N/15th St N	Signal	9.8	A	32.5	C
62	10th Ave S/18th St S	TWS	1794.7	F	3011.9	F
63	38th St N/2nd Ave N	Signal	10.9	B	11.9	B

*TWS = Two-Way Stop, AWS = All-way Stop

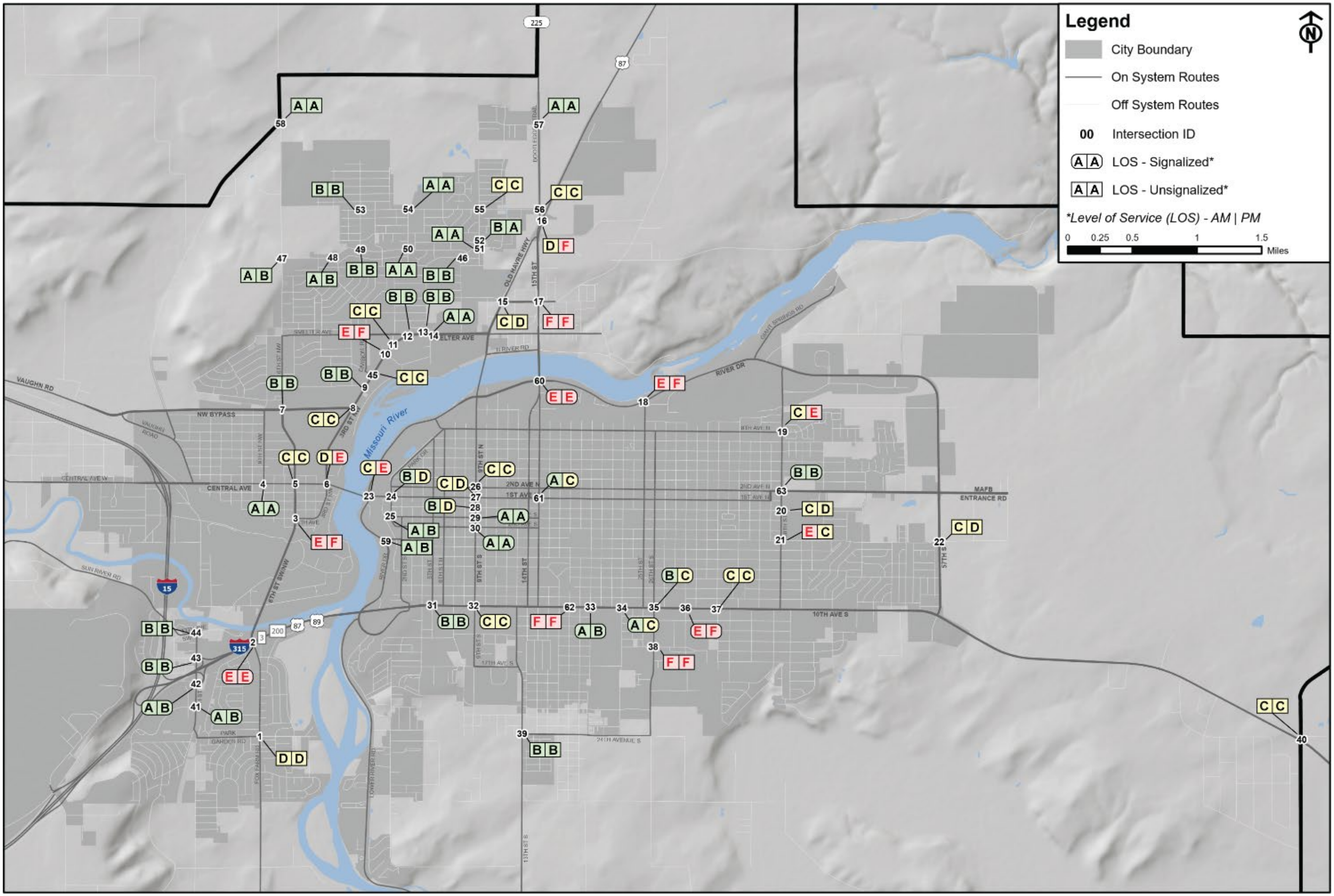


Figure 4.4: Projected Intersection Level of Service

5.0 AREAS OF CONCERN AND CONSIDERATION SUMMARY

This section provides a list and description of areas of concern within the study area which should be taken into consideration as recommendations are developed for the LRTP. These areas were identified through review of existing traffic data, growth projections, field review, public comment, and other available resources. Please refer to previous sections for more detailed discussions.

5.1. EXISTING TRANSPORTATION SYSTEM

- **MAJOR STREET NETWORK:** A transportation system is made up of a hierarchy of roadways functionally classified according to parameters such as geometric configuration, traffic volumes, spacing, speed, and adjacent land use. Maintaining this hierarchy is important for efficient traffic management throughout the entire network. Although traffic volumes may differ between urban and rural sections of a roadway, it is important to still maintain coordinated right-of-way standards to allow for efficient operation and potential urban development in the future.
- **BICYCLE AND PEDESTRIAN FACILITIES:** The RET provides a significant pedestrian and bicycle network in the Great Falls area but is generally constrained to the banks of the Missouri River. While pedestrians have ample access to sidewalks in and around the city, there is a relative lack of sidewalks in recently annexed areas and in areas outside the city boundary. The bicycle network is generally lacking, and some bike facility markings and signage have not been well-maintained since their original installation. Widened sidewalks in the study area are intended to serve both pedestrians and bicyclists.
- **TRANSIT:** The GFTD currently operates seven fixed routes and a curb-to-curb paratransit service covering a service area of 20 square miles within the City of Great Falls. Buses operate on a fixed fare basis from 6:00 AM to 6:30 PM on weekdays and from 9:30 AM to 5:30 PM on Saturday with no transit service provided on Sundays or major holidays. Users have indicated that, as Great Falls continues to expand outward, transit services are limited, inconvenient, or otherwise unavailable. The GFTD is currently conducting an update to its *Transit Development Plan*.
- **ELECTRIC VEHICLES:** Cascade County residents are beginning to adopt electric vehicle technologies. Great Falls has 7 public electric vehicle charging stations with 21 ports supporting I-15, the only AFC in the Great Falls area.
- **FREIGHT AND RAIL:** Freight movement is critical to the Great Falls economy, providing access to important commodities, creating jobs, and encouraging economic growth. It is important to understand and consider how truck and rail networks within the study area interact with the rest of the transportation network to help ensure all transportation modes can move safely and efficiently through the network.
- **ROADWAY CAPACITY:** High traffic volumes are experienced along 10th Avenue South, River Drive, Central Avenue, 3rd Street Northwest, and Smelter Avenue. Several segments on River Drive, 10th Avenue South, Central Avenue, and 9th Street South are at or approaching the available capacity of the roadway. Conversely, some of the Downtown one-way streets carry traffic volumes far below their available capacity.
- **INTERSECTION LOS:** A handful of unsignalized intersections are operating at or beyond their available capacity during peak hours under existing conditions. Several other intersections of varying traffic control experience LOS C or D during peak hours and may experience worsening conditions as growth occurs.

- **COMMUTE MODE SHARE:** The share of Great Falls residents who walk, bike, or take public transportation to work has decreased in recent years while personal vehicle ownership has also decreased. However, the share of workers who work from home has increased. According to the city's walk score, Great Falls is a car-dependent city with most errands requiring a vehicle.
- **REGIONAL TRAVEL PATTERNS:** Weekday traffic experiences distinct peaks during the morning, midday, and evening commuting timeframes. On weekends, traffic volumes are approximately 34 percent less than on weekdays. More trips are taken in the Great Falls area during August and September but otherwise experience little variation throughout the year. Average trip lengths for all vehicles range from 12 to 23 miles long with about 75 percent of all trips in the Great Falls area being less than 5 miles long. Approximately 6 percent of trips originating in the Great Falls area end in a destination outside the Great Falls area with the Southside and Westside areas accounting for the highest number of trips within the study area.
- **EQUITY:** When compared to the Nation, Cascade County is generally considered disadvantaged, however, in comparison to the state of Montana only, Great Falls ranks lower in terms of comparative disadvantages. The core of Great Falls, generally bounded by 10th Avenue South, River Drive, and 38th Street North, is ranked relatively low in terms of Transportation Insecurity with Transportation Insecurity increasing in further reaches of the city and in the county due to longer commute times and limited access to transit.
- **STRUCTURES AND PAVEMENT:** Of the 44 structures within the study area, 5 are owned and maintained by the City of Great Falls. Two MDT-owned bridges are rated as poor. The majority of the roadway network is reported as being in fair condition, however approximately 35 miles of roadway are in poor to failing condition and require major rehabilitation or reconstruction. The city plans to conduct a full pavement inventory to re-establish baseline conditions and help inform future investment decisions.

5.2. Safety Conditions

- **TOTAL CRASHES:** A total of 8,567 crashes were reported within the study area between January 1st, 2017, and December 31st, 2021. There were 1,674 injury crashes reported with about 5 percent of those crashes being severe. Sixteen fatalities were reported over the five-year period.
- **CRASH PERIOD:** Crash occurrences are heavily correlated with traffic volumes with higher numbers occurring during peak commuting hours on weekdays. Approximately 48 percent of all crashes occurred during winter months (November to March) with the most crashes occurring in February. However, the largest number of severe crashes occurred during August.
- **CRASH TYPE:** The most common multi-vehicle crash types were rear-end and right angle crashes while the most common single-vehicle crash types were fixed object, wild animal, and rollover crashes.
- **CRASH LOCATION:** About 45 percent of crashes occurred at a non-junction and roughly 50 percent of crashes were at or related to an intersection. The greatest number of crashes occurred on local roads (38 percent), however the greatest number of severe crashes occurred on principal arterials (39 percent) where traffic volumes and travel speeds are greater.
- **ENVIRONMENTAL CONDITIONS:** Crashes occurred most commonly on clear or cloudy days with dry roads and daylight. Approximately 27 percent of crashes occurred under inclement road conditions. About 41 percent of crashes occurred under dark lighting conditions (both with and without street lighting).

- **DRIVER CHARACTERISTICS/BEHAVIOR:** About 26 percent of severe crashes and 6 percent of all crashes involved an impaired driver. Less than 2 percent of drivers were fatigued or distracted at the time of the crash. About 12 percent of drivers involved in crashes were over the age of 65 and about 2 percent were under the age of 15.
- **VEHICLES/PERSONS INVOLVED:** Large trucks or buses were involved in about two percent of crashes while motorcycles were involved in less than one percent of crashes (but 16 percent of severe crashes). There were 49 bicycle and 94 pedestrian-related crashes that occurred within the analysis period, with 11 pedestrian-related crashes resulting in severe injuries.
- **HIGH INJURY NETWORK:** In general, intersections along high volume corridors, including 10th Avenue South and Central Avenue, received the highest overall safety scores. However, some intersections on lower-volume routes were also identified as having high safety scores including 4th Avenue South, 6th Avenue South, and 8th Avenue South due to higher crash rates. Two of the highest scoring intersections have recently been reconstructed to address historic trends. When intersection crashes are excluded, the frequency of crashes and severe injuries on individual roadway segments is much lower. Overall, the roadway segment safety score analysis revealed a mix of urban and rural locations with nearly half of the top scoring segments being on lower volume roads outside city limits.

5.3. Projected Transportation Conditions

- **ROADWAY CAPACITY:** River Drive, Central Avenue, 10th Avenue South, 3rd Street Northwest, and Smelter Avenue are likely to approach or exceed available roadway capacity by 2045 if traffic continues to grow as anticipated. Consequently, traffic is anticipated to shift to other arterials in the roadway network to avoid congestion on parallel routes. As a result of growth in the southern part of the city near the universities and hospitals, traffic volumes are expected to increase, though continuing to operate below capacity.
- **INTERSECTION LOS:** With continued growth intersection operations on major arterials will experience deteriorated conditions and high amounts of delay, especially during the PM peak hour. Several unsignalized intersections are shown to operate at LOS E or F during one or more peak hours. There are also several signalized intersections which are projected to reach or exceed their available capacity if traffic growth occurs in the manner predicted. Intersections along 10th Avenue South, 3rd Street Northwest, River Drive, 6th Street Southwest, 15th Street and 38th Street experience the highest amounts of delay.

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